

2016

Louisiana Suggested Chemical Weed Management Guide



**LOUISIANA SUGGESTED CHEMICAL WEED MANAGEMENT GUIDE
2016**

Table of Contents

INTRODUCTION	2	Cucurbits (Cucumber, Squash, Watermelon, Pumpkin, Cantaloupe).....	148
WEED RESISTANCE AND HERBICIDE MODE OF ACTION	4	Eggplant.....	151
GUIDELINES FOR MANAGING WINTER VEGETATION	9	Greens (Collard, Mustard, Turnip)	153
CORN	17	Garlic.....	154
COTTON	25	Leafy Vegetables (Lettuce, Endive, Escarole, Radicchio).....	156
GRAIN SORGHUM	35	Irish potato	158
RICE	38	Okra.....	161
SOYBEAN	50	Onion	162
SMALL GRAINS (Wheat, Barley, Oats, Rye)	61	Peppers	165
SUGARCANE	67	Shallot (Dry Bulbs).....	169
PEANUT	94	Southern Pea.....	170
HOME GARDENS	96	Spinach	173
LAWN and TURF98		Sweet Potato.....	174
Turfgrass tolerance to99 selected herbicides.....	98	Tomato	175
General home lawn weed control.....	99	PASTURE and FORAGES	180
FRUIT CROPS		NONCROPLAND (Perennial, Annual Grass Weeds and Vines)	184
Strawberry.....	108	WOODY PLANTS and FORESTRY	187
Blackberry (Erect & Trailing Blackberry/Dewberry)	110	AQUATICS (Lakes and Ponds).....	190
Blueberry.....	112	RECRP INTERVALS FOR VARIOUS HERBICIDES	194
Citrus	114	CALIBRATION PROCEDURES	198
Grape (Muscadine & Bunch).....	118	CONVERSION FACTORS	200
Mayhaw.....	120	NOZZLE TYPES and DRIFT REDUCTION	201
Peach.....	121	GLOSSARY OF HERBICIDES	202
Pecan	123	Appendix A: Glyphosate products and formulations	213
COMMERCIAL NURSERY and LANDSCAPE	126	Should the registration of a herbicide or certain uses of a herbicide be canceled by Federal or State agencies, suggestions thus affected herein are no longer applicable. Use of products in this guide does not constitute a guarantee or warranty of the products named and does not signify that these products are approved to the exclusion of comparable products.	
VEGETABLE CROPS			
Artichoke.....	132		
Asparagus.....	133		
Snap and Lima Beans.....	136		
Beet	139		
Cole Crops (Cabbage, Cauliflower, Broccoli, Brussels Sprouts).....	141		
Carrot.....	143		
Sweet Corn.....	145		

INTRODUCTION

Herbicide rates are for broadcast application unless specified differently in the table heading for each crop. Conversion tables are provided to aid in converting large volumes, such as quarts and gallons, to ounces, tablespoons and teaspoons.

Rates of soil-applied herbicides vary according to soil type because soils can affect herbicide activity. The lower rate is for sandy loams (light), intermediate rate for silt loams (medium) and the higher rate for clay loam and clay (heavy) soils. In some instances the same rate may be suggested for both medium and heavy soils.

Herbicides should be applied in enough water to assure distribution over the area treated. That amount may vary from 5 to 40 gallons per acre on a broadcast basis. Wettable powder formulations require at least 50 mesh screens throughout the spray system and nozzle tips with a capacity of 0.2 GPM or larger. Considerable agitation is necessary to keep wettable powders in suspension. Hardened stainless steel and nylon nozzles are more resistant to wear from the application of wettable powders than brass nozzles.

Tanks made of aluminum, fiberglass or other corrosion-resistant materials will reduce the amount of nozzle clogging. Some herbicides may not be used in unlined steel tanks. Be sure that the water used as the spray solution is free from trash and other foreign material, particularly mud or soil particles.

Correct calibration is of utmost importance. Excess rates may cause injury to the applied crop, injury from excess residue to succeeding crops and increased herbicide costs. Less than recommended rates can result in unsatisfactory weed control. Read the label and know that you are applying only the recommended amount.

Every herbicide has a rain-free (rain-fastness) time requirement to achieve proper efficacy. Herbicide labels should be consulted prior to application to determine the rain-free time requirement.

RESTRICTED USE PESTICIDES

Some of the pesticides or certain uses of pesticides in this publication may be classified for restricted use. Those pesticides with restricted use labels will contain information regarding these restrictions. Be sure to read all labels thoroughly. It is illegal to use any pesticide in a manner that is inconsistent with the label directions. It is unlawful for a noncertified applicator to use a pesticide that has been classified with restricted uses. Information on pesticide applicator certification programs may be obtained from the LSU AgCenter.

If herbicides are handled or applied improperly or if unused portions are not disposed of safely, they may be injurious to humans, domestic animals, desirable plants and fish or other wildlife and may contaminate water supplies. Use herbicides only when needed and handle them with care. Follow the directions, and heed all precautions on the container label. Please consult Material Safety Data Sheets (MSDS) for herbicides to determine toxicity information prior to use.

DIFFERENT TYPES OF HERBICIDE REGISTRATIONS

Additional herbicides for crop production have been introduced in the recent past and likely will be in the foreseeable future. During this time of change, growers will be introduced to terminology that has very specific meanings toward the development and use of these additional herbicides. The purpose of this section is to introduce, list and explain the definition and implications of this terminology and to promote increased grower understanding that may aid in complying with state and federal pesticide laws.

HERBICIDE LABELS

State and federal agencies regulate herbicide use through the issuance of herbicide labels, which are the directions for herbicide use and have the effect of federal law. Each herbicide is identified under various "sections" or parts of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). FIFRA is the federal law that addresses, among other things, how a herbicide may be used. Contained within FIFRA are the sections that deal with specific situations. Three types of labels, each addressed by a specific Section of FIFRA, herbicide users should understand.

SECTION 3 – The most comprehensive registration granted. This registration shows the United States Environmental Protection Agency has reviewed and approved all required information to support all uses listed on the product label.

SECTION 24[c] – Granted by the state under Federal regulation and often called a "special local need" label. A 24[c] label applies only to the state or states that issue the label and is issued for a specific use pattern for crops or sites already approved under a Section 3 label. This label has a time period of use (usually 5 years), which may be renewed.

SECTION 18 – An Emergency Exemption label is petitioned to the U.S. EPA through the state to control a specific weed problem not adequately addressed by any Section 3-labeled herbicides and poses a threat to crop production. Before determining issuance of a Section 18 label, each Section 18 petition is scrutinized by U.S. EPA. If the label is issued, herbicide use is very clearly defined. If the U.S. EPA does not approve the Section 18 petition, the state may issue a Crisis Exemption and allow use of the herbicide. In all cases, Section 18 labels are temporary and expire within 1 year of issuance.

SUMMARY

Different types of labels allow herbicide use under varying conditions. It is important for herbicide users to understand this part of the herbicide registration process, the results and how those results affect herbicide use. Much more information is available at the Internet sites listed below. U.S. EPA Office of Pesticide Programs <http://www.epa.gov/pesticides/>; FDA (Food and Drug Administration) www.fda.gov/; USDA Extension Service <http://www.csrees.usda.gov/>. In addition, herbicide labels and MSDS sheets can be found at <http://www.cdms.net/LabelsMsds/LMDefault.aspx>, <http://www.agrian.com/home/> or the herbicide manufacturer's website.

LOUISIANA SUGGESTED WEED MANAGEMENT GUIDE EDITORIAL COMMITTEE

Daniel O. Stephenson, IV, Corn, Cotton, Grain sorghum, and Soybean Weed Management, Associate Professor, Dean Lee Research and Extension Center
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Ron E. Strahan, Turf and Ornamental Weed Management, Associate Professor, School of Plant, Environmental and Soil Sciences
Eric P. Webster, Rice Weed Management, Professor, School of Plant, Environmental and Soil Sciences

WEED RESISTANCE

Weed resistance is defined by the Weed Science Society of America (WSSA) as the inherited ability of a plant to survive and reproduce after exposure to a dose of herbicide normally lethal to the wild type. In a plant, resistance may be naturally occurring or induced by such techniques as genetic engineering or selection of variants produced by tissue culture or mutagenesis (WSSA). Repeated application(s) of the same herbicide or a different herbicide with similar mode of action on the same field in consecutive years has contributed to the widespread occurrence of resistance to herbicides in several weed species around the world, in the U.S. and in Louisiana (see list below). Weed management programs must not solely depend on herbicides to be economically sustainable in the long term. A combination of the following management strategies is recommended:

1. Use residual herbicides.
2. Rotate different crops.
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.
6. Utilize tillage, cultivation or other cultural practices whenever and wherever feasible.
7. Clean equipment thoroughly before and after each use.
8. Control weeds on fallow ground or set aside to prevent spreading of documented or suspected resistant weeds.

If you suspect resistance after a herbicide application, attempt to eradicate the escapes using cultural methods (i.e., hand-removal, tillage). **DO NOT ALLOW WEEDS TO PRODUCE SEED.** If seed are produced, collect a seed sample from suspect plants and take to your parish LSU AgCenter Extension agent who will have them screened by an LSU AgCenter scientist and inform you if the population is resistant.

HERBICIDE-RESISTANT WEEDS IN LOUISIANA

Weed	Herbicide
Amazon sprangletop	cyhalofop-butyl, fenoxaprop-P-butyl
Barnyardgrass	propanil, quinclorac, imazethapyr
Common cocklebur	MSMA, DSMA
Italian ryegrass	glyphosate
Itchgrass	fluazifop-P-butyl
Johnsongrass	glyphosate, fluazifop-P-butyl, clethodim
Palmer amaranth	glyphosate
Rice flatsedge	halosulfuron
Common waterhemp	glyphosate

HERBICIDE MODE OF ACTION

WSSA Group	HRAC Group	Site of Action	Chemical Family	Active Ingredient
1	A	Inhibition of acetyl CoA carboxylase (ACCase)	Aryloxyphenoxy-propionate 'FOPs'	cyhalofop-butyl diclofop-methyl fenoxaprop-P-ethyl fluazifop-P-butyl quizalofop-P-ethyl
			Cyclohexanedione 'DIMs'	clethodim sethoxydim tralkoxydim
			Phenylpyrazoline 'DEN'	pinoxaden
2	B	Inhibition of acetolactate synthase ALS (acetohydroxyacid synthase AHAS)	Sulfonylurea	bensulfuron-methyl chlorimuron-ethyl chlorsulfuron flazasulfuron foramsulfuron halosulfuron-methyl iodosulfuron mesosulfuron metsulfuron-methyl nicosulfuron primisulfuron-methyl prosulfuron rimsulfuron sulfometuron-methyl sulfosulfuron thifensulfuron-methyl tribenuron-methyl trifloxysulfuron
			Imidazolinone	imazapic imazamox imazapyr imazaquin imazethapyr

HERBICIDE MODE OF ACTION: continued

WSSA Group	HRAC Group	Site of Action	Chemical Family	Active Ingredient
		Inhibition of acetolactate synthase ALS (acetohydroxyacid synthase AHAS): continued	Triazolopyrimidine	cloransulam-methyl diclosulam flumetsulam penoxsulam
			Pyrimidinyl(thio)benzoate	bispyribac-Na pyrithiobac-Na
5	C1	Inhibition of photosynthesis at photosystem II	Triazine	atrazine prometryn simazine
			Triazinone	hexazinone metribuzin
			Uracil	bromacil terbacil
7	C2	Inhibition of photosynthesis at photosystem II	Urea	diuron fluometuron (see F3) linuron siduron tebuthiuron
			Amide	propanil
6	C3	Inhibition of photosynthesis at photosystem II	Nitrile	bromoxynil
			Benzothiadiazinone	bentazon
22	D	Photosystem-I-electron diversion	Bipyridylum	diquat paraquat
14	E	Inhibition of protoporphyrinogen oxidase (PPO)	Diphenylether	acifluorfen-Na fomesafen lactofen oxyfluorfen
			Phenylpyrazole	pyraflufen-ethyl
			N-phenylphthalimide	flumioxazin flumiclorac-pentyl

HERBICIDE MODE OF ACTION: continued

WSSA Group	HRAC Group	Site of Action	Chemical Family	Active Ingredient
		Inhibition of protoporphyrinogen oxidase (PPO): continued	Thiadiazole	fluthiacet-methyl
			Oxadiazole	oxadiazon
			Triazolinone	carfentrazone-ethyl sulfentrazone
12	F1	Inhibition of carotenoid biosynthesis at the phytoene desaturase step (Bleacher)	Pyridazinone	norflurazon
27	F2	Inhibition of 4-hydroxyphenyl-pyruvate-dioxygenase (4-HPPD) (Bleacher)	Triketone	mesotrione tembotrione
			Isoxazole	isoxaflutole
			Pyrazolone	topramezone
13		Inhibition of carotenoid biosynthesis (unknown target) (Bleacher)	Isoxazolidinone	clomazone
			Urea	fluometuron (see C2)
9	G	Inhibition of EPSP synthase	Glycine	glyphosate
10	H	Inhibition of glutamine synthetase	Phosphinic acid	glufosinate-ammonium
18	I	Inhibition of DHP (dihydropteroate) synthase	Carbamate	asulam
3	K1	Microtubule assembly inhibition	Dinitroaniline	benefin = benfluralin ethalfluralin oryzalin pendimethalin trifluralin
			Pyridine	dithiopyr
			Benzamide	propyzamide = pronamide
			Benzoic acid	DCPA = chlorthal-dimethyl

HERBICIDE MODE OF ACTION: continued

WSSA Group	HRAC Group	Site of Action	Chemical Family	Active Ingredient
15	K3	Inhibition of VLCFAs (Inhibition of cell division)	Chloroacetamide	acetochlor alachlor dimethenamid-P metolachlor
			Acetamide	napropamide
			Oxyacetamide	flufenacet
			Pyrazole	pyroxasulfone
20	L	Inhibition of cell wall (cellulose) synthesis	Nitrile	dichlobenil
21			Benzamide	isoxaben
8	N	Inhibition of lipid synthesis - not ACCase inhibition	Thiocarbamate	butylate EPTC molinate thiobencarb = benthocarb
			Phosphorodithioate	bensulide
			Benzofuran	ethofumesate
4	O	Action like indole acetic acid (synthetic auxins)	Phenoxy-carboxylic-acid	2,4-D 2,4-DB MCPA mecoprop = MCPP = CMPP
			Benzoic acid	dicamba
			Pyridine carboxylic acid	clopyralid fluroxypyr picloram triclopyr
			Quinoline carboxylic acid	quinclorac
19	P	Inhibition of auxin transport	Phthalamate Semicarbazone	naptalam diflufenzopyr-Na
25	Z	Unknown herbicide mode of action	Organoarsenical	DSMA and MSMA

GUIDELINES FOR MANAGING WINTER VEGETATION

INTRODUCTION

Conservation tillage systems, whether no-till or stale seedbed, require herbicide programs that successfully control native winter vegetation or planted cover crops prior to planting. Elimination of competing vegetation helps to assure crop stand establishment, rapid early season crop growth and efficient fertilizer utilization. Winter vegetation common to Louisiana ranges from easy-to-control weeds, such as annual bluegrass and common chickweed, to difficult-to-control species, such as curly dock and ryegrass. Cover crops may include wheat, rye, vetch, winter peas and tillage radish among others. Consequently, proper weed identification and herbicide selection are keys to a successful preplant burndown weed control program.

More than 20 “winter weeds” are commonly found in fields throughout Louisiana. However, only a few key species dictate selection of the most effective herbicide program. Glyphosate and paraquat continue to be the “backbone” of most burndown herbicide programs. Each product exhibits specific strengths and weaknesses. Tank-mixtures with other herbicides broaden the spectrum of control and/or provide residual control until planting. Glyphosate provides slow systemic control of weeds, while paraquat results in fast contact control requiring thorough weed coverage for maximum effectiveness. Addition of ammonium sulfate to glyphosate spray solution can be beneficial when “hard water” (water containing mineral salts, including iron, calcium and magnesium) is used as the carrier. These conditions are more often observed in private wells and not municipal water sources.

Glyphosate provides good-to-excellent control of annual bluegrass, Carolina foxtail, little barley, buttercup species, chickweed species, dandelion, horseweed (mare’s-tail), shepherd’s-purse, bittercress and Virginia pepperweed. Control of geranium species, curly dock, henbit, cutleaf eveningprimrose, smartweed species and legume cover crops has been poor to fair. Tank-mixture with other herbicides can improve control of these weeds as presented in Table 1.

Paraquat provides good to excellent control of annual bluegrass, little barley, buttercup species, geranium species, chickweed species, henbit, and shepherd’s-purse. Control of ryegrass, curly dock, cutleaf eveningprimrose, horseweed (mare’s-tail), smartweed species, swinecress, legume cover crops and Virginia pepperweed has been poor. Tank-mix partners increase activity of paraquat on these species (Table 1).

Liberty 280 SL is effective on numerous winter weeds found in Louisiana (Table 1). Activity of the herbicide is optimum under higher temperatures than those observed with glyphosate or paraquat. Although it is an excellent burndown herbicide, producers are limited in the amount of Liberty 280 SL that can be used per season including burndown timing. In some cases, producers are well-advised to save their Liberty 280 SL for managing weeds within the growing crop.

TIMING OF VEGETATION REMOVAL

Timing of vegetation removal is another critical factor for successfully implementing reduced tillage programs. Conservation tillage practices provide an environment favorable to insect pest populations, primarily cutworms. Cutworm larvae feed on existing winter vegetation until it is removed or decomposed to a point no longer adequate as a food source. If present at planting, cutworm larvae may threaten stands of emerging crops. Research has shown that destroying winter vegetation at least three to four weeks prior to cotton planting is critical. Cutworms are able to feed on decaying vegetation; therefore, a herbicide application six to eight weeks prior to planting is preferable. Labeled pyrethroid insecticides can be used in combination with a burndown herbicide or at-planting¹ when the potential for cutworm infestation is high. If any living vegetation remains on the seedbed at planting, insecticide should be used for cutworm management. Recent research has shown that even when insects are managed, weeds like cutleaf eveningprimrose and swinecress will reduce crop yield when not removed well in advance of planting. In a five year study, corn yield was 15% to 25% higher when weeds were removed four weeks before planting compared to two weeks.

USE OF FALL- OR SPRING-APPLIED RESIDUAL HERBICIDES FOR MANAGING TROUBLESOME WEEDS

Increased problems in managing weeds like henbit and Italian ryegrass in the spring has led to increased interest in fall herbicide programs. Research has shown that an application of a residual herbicide in the fall can assist spring herbicide applications for preplant burndown in overall management of numerous troublesome weeds. Applications in Louisiana are optimum beginning around November 15. Numerous herbicides provide good control of grass and broadleaf winter annual weeds (Table 2).

In some cases, the herbicide must be tilled, moved or in some way disturbed prior to planting. Be certain to check the product labels for specific recommendations. Although these treatments will result in a relatively weed-free seed bed at planting, the soil will be exposed to weathering. Therefore, these treatments should not be used on highly erodible or sloping soil. **Be certain to consult with your local FSA or NRCS office to determine if you can use these treatments without conflicting with your conservation plan.**

Following the spring burndown herbicide application, weeds may regrow or new weeds may germinate when the treatment is applied six to eight weeks prior to planting. In these situations, use of residual herbicides such as Goal 2XL, Valor, Canopy EX, Envive, Enlite, Leadoff and Valor XLT with glyphosate, paraquat or Liberty 280 SL can be beneficial in increasing control of existing weeds or provide soil residual

¹ In-furrow application is the least effective method for controlling cutworms.

GUIDELINES FOR MANAGING WINTER VEGETATION

control. However, they perform best as residual herbicides used earlier in the season (January and early February) or closer to planting. The use of residual herbicides earlier in the season will improve the control of troublesome winter weeds and help protect crops from yield losses associated with late burndown timings. Sequential applications of glyphosate or paraquat are also very effective and may eliminate the need for tank-mixes. Glyphosate applied alone or in tank-mixture six weeks prior to planting followed by paraquat or Liberty 280SL at planting is an excellent weed control program.

Plant-back restrictions can influence which residual herbicide is selected. Table 4 provides a list of the plant-back restrictions for commonly used fall- and spring-applied herbicides for major crops in Louisiana.

GLYPHOSATE RESISTANT HORSEWEED (MARE'S-TAIL) and ITALIAN RYEGRASS

Glyphosate-resistant horseweed (mare's-tail) is present in Louisiana. In Louisiana, few acres receive a burndown application composed strictly of glyphosate, since we have weeds that are difficult to control with glyphosate alone. Thorough scouting and tank-mixes with herbicides will control glyphosate-resistant horseweed (mare's-tail). It is recommended that 8 to 12 oz/A (0.25 lb ai/A) dicamba (Banvel or Clarity) be tank-mixed with glyphosate when horseweed (mare's-tail) is present, whether glyphosate-resistance is suspected or not. Herbicides such as Leadoff, Canopy EX, Envive or 2,4-D can exhibit good activity on emerged horseweed (mare's-tail) but not to the level of dicamba. Fall application of Leadoff, Canopy EX, Envive, Envolve, Valor XLT, Fierce or Valor prior to horseweed (mare's-tail) emergence provides excellent residual control. Please consult individual product labels for rates, precautions and plant-back restrictions.

Preliminary data indicate that glyphosate-resistant Italian ryegrass is present in Louisiana. Producers are encouraged to closely monitor Italian ryegrass populations. Mississippi State University weed scientists have developed a glyphosate-resistant Italian ryegrass management plan that has been adopted by LSU AgCenter weed scientists. Management of glyphosate-resistant Italian ryegrass depends on the crop to be planted in the spring and can be divided into a fall, winter or spring management timing, but research has shown more Italian ryegrass control when control measures are initiated in the fall followed by a winter or spring herbicide application. Fields should be double disked (all crops) or Command (rice only) at 2 pt/A, Boundary at 2.0 pt/A, Dual Magnum (corn, cotton and soybean) at 1.33 to 1.67 pt/A or trifluralin (cotton and soybean) at 3 pt/A applied mid-October to mid-November. Emerged glyphosate-resistant Italian ryegrass will not be controlled by these products; therefore, these products should be tank-mixed with paraquat at 0.5 to 0.75 lb a.i./A. Regardless of which fall control measure was utilized, fields should be scouted in January to February, and if glyphosate-resistant Italian ryegrass has emerged, Select

Max at 12-16 oz/A (or equivalent rate of 2 lb clethodim formulation) should be applied; however, preplant applications of Select Max or 2 lb clethodim should be made at least 30 days before planting corn or rice. Multiple applications of Select Max or a 2 lb clethodim are discouraged to prevent development of resistance to this herbicide. If no control measures are initiated in the fall or winter or if glyphosate-resistant Italian ryegrass was not observed earlier, paraquat at 0.75 to 1.0 lb a.i./A should be applied when resistance is identified. Research has shown that the addition of atrazine (corn) at 1 qt/A, metribuzin (soybean) at 4 oz/A or diuron (cotton) at 1.5 pt/A will increase efficacy of paraquat against glyphosate-resistant Italian ryegrass. Sequential applications should be based on careful scouting for emerged glyphosate-resistant Italian ryegrass.

SUMMARY

Burndown herbicide decisions should be based on activity of glyphosate or paraquat on the most difficult to control weed species present. Appropriate tank-mixtures should be considered based on their ability to enhance control with glyphosate or paraquat and/or to provide residual activity. A list of guidelines for choosing appropriate burndown programs follows:

Guidelines for Choosing a Burndown Program

1. Vegetation should be destroyed at least three to four weeks prior to planting, preferably six to eight weeks.
2. Choice of herbicide program depends on the most difficult to control weed species present.
3. Use glyphosate if annual ryegrass, horseweed (mare's-tail), swinecress, speedwell, groundsel, Virginia pepperweed or wheat is the target vegetation. Use paraquat if geranium spp. or henbit is the primary weed present.
4. If glyphosate-resistant Italian ryegrass or horseweed (mare's-tail) is suspected or confirmed, utilize alternative residual or postemergence herbicides based upon research.
5. Carolina geranium, curly dock, cutleaf eveningprimrose, clover species, henbit, smartweed, swinecress and legume cover crop control can be increased when glyphosate is tank-mixed with other herbicides.
6. Carolina foxtail, curly dock, cutleaf eveningprimrose, clover species, dandelion, groundsel, henbit, horseweed (mare's-tail), smartweed, speedwell, swinecress, Virginia pepperweed and legume cover crop control can be increased when paraquat is tank-mixed with other herbicides.
7. Consider using an insecticide program that controls cutworms if any live vegetation is present at planting.

GUIDELINES FOR MANAGING WINTER VEGETATION

Table I. Effectiveness of selected spring-applied herbicides and/or herbicide combinations for controlling winter vegetation.

	Paraquat	Paraquat + Goal 2XL	Paraquat + Harmony Extra	Paraquat + Firstshot	Paraquat + Clarity	Paraquat + 2,4-D	Glyphosate	Glyphosate + Goal	Glyphosate + Harmony Extra	Glyphosate + FirstShot	Glyphosate + Clarity	Glyphosate + 2,4-D	Clarity	2,4-D	Glyphosate + Valor	Liberty 280 SL
Annual bluegrass (2-6")	9	9	9	9	9	9	9	9	9	9	9	9	0	0	9	9
Ryegrass (6-10")	4	5	5	5	4	4	7	7	7	7	7	7	0	0	7	6
Carolina foxtail (2-6")	8	9	8	8	8	8	9	9	9	9	8	9	0	0	9	9
Little barley (2-6")	9	9	9	9	9	9	9	9	9	9	9	9	0	0	9	9
Buttercups (2-6")	9	9	9	9	9	9	9	9	9	9	9	9	-	9	9	9
Geranium spp. (2-6")	9	9	9	9	9	9	5	6	8	8	7	8	5	6	6	9
Chickweeds (2-4")	9	9	9	9	9	9	9	9	9	9	9	9	3	3	9	9
Curly dock (6-8")	4	5	7	7	7	7	6	7	9	9	8	9	8	7	8	8
Cutleaf eveningprimrose (6-10")	4	7	8	8	8	9	4	6	7	7	8	9	8	9	6	8
Cutleaf eveningprimrose (2-5")	4	7	8	8	8	9	5	8	7	7	8	9	8	9	8	9
Clovers/medics (2-6")	6	8	9	9	8	8	5	7	8	8	9	9	9	9	-	9
Dandelion (4-6")	8	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Groundsel (2-4")	7	9	9	9	9	9	9	9	9	9	9	9	-	9	9	9
Henbit (6-8")	8	9	9	9	8	8	6	9	9	9	8	7	6	5	9	9
Marestail (4-10")	5	7	7	7	6	6	9	9	9	9	9	9	9	6	9	9
Smartweed spp. (2-6")	4	7	9	9	8	6	7	8	9	9	9	8	8	6	9	-
Purslane speedwell (2-4")	7	8	9	9	8	8	9	9	9	9	9	9	-	5	9	-
Shepherd's purse (6-10")	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8
Smallflower bittercress (6-10")	9	9	9	9	9	9	9	9	9	9	9	9	7	7	9	-
Swinecress (2-4")	2	3	7	7	6	6	7	8	9	9	8	8	7	6	8	9
Legume cover crops (6-8")	6	8	9	9	9	9	5	7	8	8	9	9	9	9	7	9
Virginia pepperweed (4-6")	2	7	7	7	9	9	9	9	9	9	9	9	-	3	9	-
Wheat (8-12")	7	8	7	7	6	6	9	9	9	9	8	9	0	0	9	7

GUIDELINES FOR MANAGING WINTER VEGETATION

Table 2. Effectiveness of selected fall-applied herbicide combinations for control of winter annual weeds 90 days after application.¹

	annual bluegrass	buttercup species	chickweed species	cutleaf eveningprimrose	henbit	swinecress	shepherd's-purse
Canopy EX ²	7	9	9	7	8	8	8
Dual Magnum	8	7	7	5	7	7	7
Enlite ²	7	9	9	7	7	8	8
Envive ²	7	9	9	7	8	8	8
Fierce	8	9	9	7	9	8	8
Goal/Galigan ³	7	9	9	8	9	9	9
LeadOff	8	9	9	7	9	8	8
Valor	6	9	9	7	8	8	8
Valor XLT ²	8	9	9	7	9	8	8

¹ Glyphosate at 1 lb/A or paraquat (Gramoxone SL at 1 qt/A) was tank-mixed with each residual herbicide.

² For use only when soybean will be planted the following spring.

³ Goal/Galigan must be tilled, moved, or in some way disturbed prior to planting.

Table 3. Effectiveness of burndown herbicides used in corn 4 weeks after application.¹

	annual bluegrass	Italian ryegrass	Carolina foxtail	little barley	Carolina geranium	chickweed	curly dock	cutleaf evening-primrose	henbit	horseweed	speedwell	Shepherd's-purse	bittercress	swinecress	smartweed
2,4-D ³	0	0	0	0	5	3	6	9	5	5	6	8	6	5	5
glyphosate ⁴	9	6	8	9	6	9	5	5	6	8	9	9	8	7	6
glyphosate + Banvel/Clarity	9	6	8	9	8	9	8	8	8	8	9	9	9	8	7
glyphosate + Goal	9	6	8	9	7	9	6	6	8	8	9	9	9	7	7
glyphosate + Valor	9	6	8	9	5	9	5	8 ²	9	8	9	9	8	8	8
glyphosate + FirstShot	9	6	8	9	7	9	8	6	8	8	9	9	9	8	9
glyphosate + 2,4-D	9	6	8	9	8	9	7	9	7	8	9	9	9	7	7
glyphosate + Sharpen	9	6	8	9	8	9	7	8	8	9	9	9	9	9	-
glyphosate +2,4-D + Clarity	9	6	8	9	8	9	9	9	8	9	9	9	8	9	9
glyphosate + 2,4-D +Valor	9	6	8	9	8	9	8	9	9	8	9	9	9	8	9
glyphosate +2,4-D + LeadOff	9	8	8	9	8	9	8	9	9	8	9	9	9	9	8
paraquat ³	8	4	7	8	8	9	4	5	5	5	6	8	8	2	4
paraquat + Goal/Galigan	9	5	8	9	9	9	5	6	8	6	7	9	9	3	5
paraquat + FirstShot	8	5	7	9	9	9	5	7	8	6	8	9	9	6	9
paraquat + 2,4-D	8	4	7	8	8	9	6	9	7	5	7	8	9	5	5

¹ Consult the label(s) prior to use and determine: (1) proper burndown application timing and herbicide rate; (2) if surfactant or crop oil concentrate is needed in the burndown treatment and (3) the required time period between burndown application and crop planting.

² Small cutleaf evening-primrose only (4 to 5 inch rosette or less).

³ Numerous formulations of 2,4-D and paraquat are available.

⁴ See Appendix A for various glyphosate products.

GUIDELINES FOR MANAGING WINTER VEGETATION

	Corn	Cotton	Grain Sorghum	Rice	Soybean
2,4-D	Before emergence ⁵	30d (see label)	15d	30d	15-30d
Aim	none	none	none	none	none
Boundary	4m	12m	12m	8m	none
Canopy EX	7m	8m/10m (see label)	9m/10m (see label)	9m/10m (see label)	none
Clarity	Before emergence	21 d (see label)	15d	See label	14d (8 oz or less; see label))
Direx	Following year	15-45d	Following year	Following year	Following year
Dual Magnum	none	none	none	following spring	none
Enlite	9m	9m	9m	15m/6m (see label)	none
Envive	10m	10m (soil pH < 7.0) 18m (soil pH > 7.0)	10m	9m (see label)	4m
Fierce	7d-2m	45d-2m	11-12m	10m	none
FirstShot	14d	14d	14d	0	7
Goal/Galigan	See label	8d	See label	See label	8
Harmony GT	Before emergence	7d	45	none	Before emergence
LeadOff	none	30d (see label)	10m	10m	30d (see label)
Liberty 280 SL ³	none	none	180	none	none
Valor	14d ⁴	30d ²	30d ²	30d ²	none
Valor XLT	10m (soil pH < 7.0) 18m (soil pH > 7.0)	10m (soil pH < 7.0) 30m (soil pH > 7.0)	10m (soil pH < 7.0) 18m (soil pH > 7.0)	9m (soil pH < 7.0) 18m (soil pH > 7.0)	none
Zidua	none	0-4m	6-12m	10-24m	0-4m

¹ Consult label for specific requirements and differing restrictions based on rate.

² An accumulation of 1 inch of rainfall or irrigation is required.

³ Only labeled for burndown in cotton, corn and soybean.

⁴ See label for rainfall and other requirements. AgCenter data suggest 30 days.

⁵ AgCenter data suggest that not more than 0.5 lb ai/A be applied within 2 weeks of planting.

GUIDELINES FOR MANAGING WINTER VEGETATION

General Fall- and Spring-Applied Programs¹

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
paraquat @ 0.47-0.94 lb/A	Gramoxone SL @ 1.9- 3.8 pt/A Apply with NIS @ 1 qt/100 gal	All annual grassy and broadleaf weeds, not more than 6" tall.	Apply near planting time. This treatment is most useful on heavy soil that should not be disturbed in the spring before planting. Apply in 5 gals of water by air or 20 gallons by ground.
thifensulfuron @ 0.2 oz/A + tribenuron @ 0.2 oz/A	FirstShot @ 0.8 oz/A Apply with NIS @ 1 qt/100 gal or COC @ 1 gal/100 gal	Smartweed, knotweed, dock and cutleaf eveningprimrose.	Apply with glyphosate or paraquat. Use table 3 as guide for planting intervals. Note labels are updated regularly and should be consulted.
glyphosate ² @ 1.0-3.0 lb/A	Glyphosate (4 lb/gal formulations) @ 1.0-3.0 qt/A	Preplant knockdown of most emerged annual weeds; weak on primrose and others (see Table 1). Controls johnsongrass from rhizomes.	Apply at least 1 week before planting. Apply after rhizomes have sprouted and johnsongrass is at least 18". Wait 7 days, disk under vegetation and plant. Follow label directions.
Pyroxasulfone + flumioxazin @ 0.143-0.215 lb/A	Fierce @ 3-4.5 oz/A	Annual winter weeds and ryegrass.	Labeled for fall and spring burndown application. Optimum fall timing is late November, early December. Note labels are updated regularly and should be consulted.
S-metolachlor + metribuzin @ 1.62 lb/A	Boundary @ 2 pt/A	Annual winter weeds and ryegrass.	Labeled for fall and spring burndown application. Fall application is labeled from September 1-November 30. Note labels are updated regularly and should be consulted.
Pyroxasulfone @ 0.053-0.213 lb/A	Zidua @ 1-4 oz/A	Excellent residual control of annual ryegrass and winter weeds from fall application.	Optimum fall timing is late November, early December. Note labels are updated regularly and should be consulted.
glyphosate ² @ 1 lb/A + carfentrazone @ 0.016- 0.031 lb/A	Glyphosate (4 lb/gal formulations) + Aim @ 1.0 qt/A + 1.0-1.6 oz/A.	Morningglories and other broadleaves. May be used to remove failed cotton stands.	Apply prior to cotton emergence. Weed species controlled are rate-dependent. Consult label for proper rate according to weed species and size.
glyphosate ² @ 1 lb/A + 2,4 D @ 0.5-1.0 lb/A	Glyphosate (4 lb/gal formulations) + 2,4-D (4L) @ 1.0 qt/A + 1 - 2 pt/A	Same as glyphosate plus, primrose, geranium and others.	Most common burndown program used in Louisiana. May not control large, flowering henbit on Delta soils. Use table 3 as guide for planting intervals. Note labels are updated regularly and should be consulted.
glyphosate ² @ 1 lb/A + dicamba @ 0.25 lb/A	Glyphosate (4 lb/gal formulations) + Clarity 4 SL @ 1 qt/A + 8 oz/A	Glyphosate-resistant horseweed. Weak on primrose, geranium and other winter broadleaf weeds. Add	At least 21 days prior to planting following 1-inch of rainfall or overhead irrigation. Use table 3 as guide for planting intervals. Note labels are updated regularly and

GUIDELINES FOR MANAGING WINTER VEGETATION

General Fall- and Spring-Applied Programs¹

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
		2,4-D if primrose is present.	should be consulted.
glyphosate ² @ 1 lb/A + flumioxazin @ 0.032-0.064 lb/A	Glyphosate (4 lb/gal formulations) @ 1 qt/A + Valor @ 1 - 2 oz/A	Same as glyphosate plus some weeds that glyphosate may not control; very good residual control of smartweed.	Valor provides excellent residual control plus some knock down of emerged weeds. Large flowering henbit may re-grow if application is made late. Use table 3 as guide for planting intervals. Labeled for fall and spring burndown application. Note labels are updated regularly and should be consulted.
glyphosate ² @ 1.0 lb/A + oxyfluorfen @ 0.1-0.25 lb/A	Glyphosate (4 lb/gal formulations) + Goal @ 1.0 qt/A + 6.4 - 16 oz/A	Same as glyphosate plus, henbit, geranium, Pennsylvania smartweed and dock.	Goal provides excellent residual control plus some knock down of emerged weeds. Large flowering henbit may re-grow if application is made late. Use table 3 as guide for planting intervals. Note labels are updated regularly and should be consulted.
glyphosate ² @ 1.0 lb/A + diuron @ 0.53-0.80 lb/A	Glyphosate (4 lb/gal formulations) + Direx 4L @ 1.5 pt/A on light soil 2.0 pt/A on medium soil Karmex 80DF @ 10 oz/A on light soil 14 oz/A on medium soil	Most small-seeded annual grasses and broadleaf weeds.	Apply 15 to 45 days prior to planting. Cover seed at least 1/2" deep. Apply to soil surface behind press wheel. To avoid possible cotton injury, do not use diuron following a soil applied organophosphate insecticide or injury may occur.
glyphosate ² @ 1.0 lb/A + chlorimuron + metribuzin @ 4.5 oz/A	Glyphosate + Canopy @ 6 oz/A	Smartweed, dock and primrose. Excellent residual control of winter weeds from fall application.	Labeled for fall and spring burndown application. Optimum fall timing is late November, early December. Consult label for pH restrictions. Note labels are updated regularly and should be consulted.
glyphosate ² @ 1.0 lb/A + chlorimuron + tribenuron @ 0.6 oz/A	Glyphosate + Canopy EX @ 2 oz/A	Smartweed, dock and primrose. Excellent residual control of winter weeds from fall application.	Labeled for fall and spring burndown application. Optimum fall timing is late November, early December. Consult label for pH restrictions and planting interval following application. Note labels are updated regularly and should be consulted.
glyphosate ² @ 1.0 lb/A + flumioxazin + chlorimuron @ 1.2 oz/A	Glyphosate + Valor XLT @ 3 oz/A	Dock, smartweed and primrose. Excellent residual control of winter weeds from fall application.	Labeled for fall and spring burndown application. Optimum fall timing is late November, early December. Consult label for pH restrictions. Note labels are updated regularly and should be consulted.
glyphosate ² @ 1.0 lb/A + chlorimuron + flumioxazin + thifensulfuron @ 1.4 oz/A	Glyphosate + Envive @ 3.5 oz/A	Dock, smartweed and primrose. Excellent residual control of winter weeds from fall application.	Labeled for fall and spring burndown application. Optimum fall timing is late November, early December. Consult label for pH restrictions. Note labels are updated regularly and should be consulted.
glyphosate ² + rimsulfuron + thifensulfuron @ 0.5 oz/A	Glyphosate + Leadoff @ 1.5 oz/A	Dock, smartweed and primrose. Excellent residual control of winter weeds including annual ryegrass from fall application.	Labeled for fall and spring burndown application. Optimum fall timing is late November, early December. Consult label for pH restrictions. Note labels are updated regularly and should be consulted.

GUIDELINES FOR MANAGING WINTER VEGETATION

General Fall- and Spring-Applied Programs¹

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
glyphosate ² + S-metolachlor @ 1.27 lb/A	Glyphosate + Dual Magnum @ 1.33 pt/A	Excellent residual control of annual ryegrass and winter weeds from fall application.	Optimum fall timing is late November, early December. Note labels are updated regularly and should be consulted.
glyphosate ² + saflufenacil @ 0.36 oz/A	Glyphosate + Sharpen @ 1 oz/A	Annual winter weeds.	Higher rates required for residual control of winter weeds from fall application. Optimum fall timing is late November, early December. Note labels are updated regularly and should be consulted.

¹ Additional information about each herbicide can be found in crops section.

² See "Appendix A" for glyphosate formulations and surfactant requirements.

CORN WEED MANAGEMENT

	seedling johnsongrass	barnyardgrass	broadleaf signalgrass	crabgrass	foxtail	itchgrass	yellow nutsedge	purple nutsedge	Palmer amaranth	prickly sida	hemp sesbania	morningglory	cocklebur	sicklepod	hophornbeam copperleaf	smellmelon
PREEMERGENCE HERBICIDES:¹																
atrazine (numerous formulations)	5	9	7	6	7	1	5	0	8	8	8	8	9	8	9	5
Bicep II Magnum, Cinch ATZ	8	9	8	9	9	1	9	1	8	8	8	8	8	8	9	9
Dual Magnum, Dual II Magnum, Cinch	7	8	8	9	9	1	7	1	9	2	2	2	2	2	2	1
Corvus	9	8	8	8	-	-	-	-	7	8	8	8	-	8	7	8
Outlook	7	8	8	9	9	1	7	1	8	2	2	2	2	2	2	1
Harness	7	9	7	9	9	1	5	1	8	2	2	2	2	2	2	1
Harness Xtra	7	9	9	9	9	1	6	1	9	8	8	8	8	8	9	9
Instigate + atrazine	8	8	-	-	-	-	-	-	9	8	8	9	-	9	9	8
Keystone NXT	4	9	9	9	-	-	-	-	8	8	8	8	-	5	9	8
Lexar EZ	7	9	9	9	9	1	9	1	9	8	8	8	8	8	9	9
Sharpen	1	1	1	1	1	-	-	-	9	7	6	6	6	5	7	7
Verdict	7	8	8	9	9	-	7	1	8	8	8	8	-	8	8	8
Zidua	9	9	9	9	9	-	-	-	8	8	8	8	-	8	8	8
POSTEMERGENCE HERBICIDES:																
2,4-D	0	1	1		1	-	3	2	8	8	8	9	9	8	8	8
Accent Q	9	8	8	4	8	8	5	4	5	2	2	6	5	5	1	1
Armezon or Impact + atrazine	3	5	5	5	-	-	-	-	9	8	8	8	-	8	8	8
atrazine (numerous formulations)	3	7	5	6	7	1	3	1	8	8	7	8	8	7	9	9
Clarity/Banvel	0	0	0	0	0	0	0	3	8	9	9	9	9	7	8	8
Callisto + atrazine	3	7	5	6	7	1	3	1	9	8	8	9	-	8	9	9
Capreno + atrazine	8	9	9	9	9	-	-	-	8	8	9	9	9	9	8	9
Status	3	3	3	0	0	0	3	5	8	9	9	9	9	8	8	8
glyphosate ^{2,3}	9	9	9	9	9	9	8	8	9	8	7	8	9	9	8	8
Halex GT ² + atrazine	9	9	9	9	9	-	8	8	9	9	9	8	9	9	9	9
Laudis + atrazine	3	4	4	4	4	-	-	-	8	8	8	8	-	8	8	8
Liberty 280SL ⁴	8	8	8	8	8	8	7	9	8	9	9	9	9	9	9	9
Realm Q + atrazine	8	9	-	-	-	-	-	-	9	8	9	9	-	9	9	9
Steadfast Q	9	9	9	8	9	-	5	5	-	3	3	7	6	6	7	7
LAYBY HERBICIDES:																
atrazine	4	4	4	4	4	0	2	0	8	0	7	8	8	6	9	9
diuron	6	6	6	6	6	5	2	1	8	7	6	7	8	7	9	9

¹ Preemergence herbicides must be activated by rainfall or overhead irrigation.

² For use in Roundup Ready corn hybrids.

³ See Appendix A for various glyphosate products.

⁴ For use only in Liberty Link corn hybrids.

CORN WEED MANAGEMENT

CORN^{1,2}

Active Ingredient and Rate ¹	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREPLANT FOLIAR²:			
2,4-D @ 0.5 – 1.0 lb/A	2,4-D Amine @ 1.0-2.0 pt/A	Broadleaf weeds	Apply 7-14 days before planting. Do not use on sandy soils.
dicamba @ 0.25 lb/A	Clarity/Banvel @ 8 oz/A	Broadleaf weeds	Reduced tillage production systems only.
glyphosate ^{4,5} @ 0.7 – 2.0 lb/A	Roundup PowerMax @ 22-44 oz/A Touchdown Total @ 24-48 oz/A 4L formulations @ 32-64 oz/A	Annual grass and broadleaf weeds	Consult label to determine rates for weeds and growth stages.
paraquat @ 0.5 – 1.0 lb/A	Paraquat (2 lb/gal formulation) @ 32-64 oz/A; Paraquat (3 lb/gal formulation) @ 22-43 oz/A Apply with NIS @ 1 qt/100 gal	Annual and perennial grass and broadleaf weeds	Use the lower rates on weeds 1-3 inches tall and higher rates on weeds 4-6 inches tall. Avoid off-site movement to emerged vegetation.
PREEMERGENCE:			
atrazine @ 2.0 lb/A (1.6 lb/A on highly erodible soils)	90 DF formulations @ 2.2 lb/A 4L formulations @ 2 qt/A Reduce rate by 25% on highly erodible soils.	Many small seeded annual broadleaf weeds and some annual grasses Inconsistent on broadleaf signalgrass	Best if applied to the soil surface after planting, before weeds emerge. Rainfall required for activation. Do not plant treated areas with any crop except corn or grain sorghum until the following year. Do not apply more than 2.0 lb ai/A/ application or 2.5 lb ai/year. Check label for tank-mixes with other herbicides. Do not mix, load or use within 50 ft of a well. Use a device to prevent back siphoning when mixing.
pyroxasulfone @ 0.11 – 0.25 lb/A + fluthiacet-methyl @ 0.003 – 0.007 lb/A + atrazine @ 0.9 – 2.0 lb/A	Anthem ATZ @ 1.75-2 pt/A on coarse soils 2-2.75 pt/A on medium soils 2.25-4 pt/A on fine soils	Most annual grasses and broadleaf weeds	Apply to the bare soil surface after planting but before weeds emerge. May also be used after corn emergence; consult label. An 18-month crop rotation restriction for all crops other than corn. Organic matter influence use rate; consult label.
thiencarbazone-methyl @ 0.02-0.033 lb/A + isoxaflutole @ 0.049-0.082	Corvus @ 3.33 oz/A on coarse soils 5.6 oz/A on medium & heavy soils	Seedling and rhizome johnsongrass. Most annual grasses and broadleaf weeds.	Do not apply if water table is less than 25 feet below ground surface. Consult label for crop rotation restrictions. Organic matter and soil pH influence use rate; consult label. Do not use on fields treated with organophosphate or carbamate insecticides. Tank-mixing Corvus with atrazine at 1.5 lb/A will increase spectrum of weeds controlled; consult label.
S-metolachlor ³ @ 0.95-1.27 lb/A	Dual II Magnum, Dual Magnum, Cinch @ 1.0 pt/A on light soil 1.17 pt/A on medium soil 1.33 pt/A on heavy soil	Most annual grasses including signalgrass, seeding johnsongrass and pigweeds	Apply after planting before weeds emerge. May also be used before planting; consult label. Rates listed should be adjusted for OM; consult label. Poor control of most large seeded broadleaf weeds. For improved broadleaf weed control mix with atrazine; consult label.

CORN WEED MANAGEMENT

CORN^{1,2}

Active Ingredient and Rate ¹	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE continued:			
acetochlor @ 1.1 - 2.0 lb/A	Harness 7.0 EC @ 1.25-1.75 pt/A on coarse soil 1.75-2.25 pt/A on med-hvy soil	Some grasses and broadleaves	Apply after planting before weeds emerge. May also be used before planting; consult label. Rates differ for reduced and no-till systems; consult label. Adjust rate per label if OM > 3%. Tank-mixing Harness with atrazine at 1.5 lb/A will increase spectrum of weeds controlled; consult label. Rates differ for reduced and no-till systems; consult label.
acetochlor @ 1.9-2.8 lb/A + atrazine @ 0.76-1.1	Harness Xtra @ 1.8 qt/A on coarse soil 2.3 qt/A on medium soil 2.3-2.6 qt/A on heavy soil	Most annual grasses and broadleaf weeds	Apply after planting before weeds emerge. See comments for acetochlor and atrazine. Adjust rates per label if OM > 3%.
acetochlor @ 1.1-1.9 lb/A + atrazine @ 0.9-1.6 lb/A	Keystone Nxt @ 1.4-1.7 qt/A on coarse soil 1.7-2.5 qt/A on medium and heavy soil	Most annual grasses and broadleaf weeds	Apply after planting before weeds emerge. See comments for acetochlor and atrazine. Adjust rates per label if OM > 3%.
rimsulfuron @ 0.02 lb/A + mesotrione @ 0.16 lb/A	Instigate @ 6 oz/A	Most annual grasses and broadleaf weeds	Apply before or after planting. Do not apply Callisto, Laudis or Armezon/Impact in same season as Instigate. Do not apply to coarse textured soils. Do not apply organophosphate insecticide in same season. Allow 4 weeks after application to apply another herbicide containing rimsulfuron. Tank-mixing atrazine at 1.5 lb/A will increase spectrum of weeds controlled.
S-metolachlor @ 1.3 lb/A + atrazine @ 1.3 lb/A + mesotrione @ 0.168 lb/A	Lexar EZ @ 3 qt/A	Most small seeded grasses and broadleaf weeds	Apply after planting before weeds emerge. Provides better annual grass and broadleaf weed control than s-metolachlor + atrazine alone. Additional, atrazine may improve morningglory control. Up to 1.3 lb ai/A atrazine can be used at layby following this treatment. Use 3.5 qt/A Lexar if soil OM is above 3%. Do not follow this treatment with an HPPD inhibitor such as Callisto, Impact or Laudis. Use caution if Counter or other OP insecticides were used at planting; consult label.
dimethenamid @ 0.56- 0.84 lb/A	Outlook 6L @ 12-14 oz/A on coarse soil 14-18 oz/A on med-heavy soil	Most annual grasses, pigweeds, and some sedges	Apply after planting before weeds emerge. May also be used before planting; consult label. Higher rates may be needed on soil with 3% or higher OM; consult label. Mix with atrazine for improved broadleaf weed control; consult label.
saflufenacil @ 0.05-0.07 lb/A	Sharpen @ 2-3 oz/A	Broadleaf weeds. Does not control grasses.	Use lower rates on coarse soils. Sharpen should be applied with additional herbicide for control of grasses. Do not apply after corn emergence. Do not apply where an organophosphate or carbamate insecticide is planned. Do not apply more than 6 oz/A per year.

CORN WEED MANAGEMENT

CORN^{1,2}

Active Ingredient and Rate ¹	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE continued:			
saflufenacil @ 0.02-0.03 lb/A + dimethenamid-P @ 0.07-0.12 lb/A	Verdict @ 10-12 oz/A on coarse soil 13-15 oz/A on medium soil 16-18 oz/A on heavy soil	Small seeded grasses and broadleaf weeds	Apply to the soil surface after planting, but before corn and weed emergence. Application following corn emergence will cause severe corn injury. Do not use on fields treated with organophosphate or carbamate insecticides. Tank-mixing Verdict with atrazine at 1.5 lb/A will increase spectrum of weeds controlled.
pyroxasulfone @ 0.08-0.21lb/A	Zidua @ 1.5-2.75 oz/A on coarse soil 2-3 oz/A on medium soil 2.5-4 oz/A on heavy soil	Most annual grasses and broadleaf weeds	Apply to the bare soil surface after planting but before weeds emerge. May also be used before planting; consult label. Only crops listed on Zidua label can be planted the following year. Tank-mixing Zidua with atrazine at 1.5 lb/A will increase spectrum of weeds controlled.
POSTEMERGENCE:			
2,4-D amine @ 0.25 – 0.5 lb/A	2,4-D Amine @ 0.5-1.0 pt/A	Broadleaf weeds	Apply before corn is 15 inches tall or after grain is dented. Do not treat at tasseling and silking stage. If necessary to spray after corn is 15 inches tall but before tasseling, do not spray in whorl. Under certain conditions injury is possible; consult label.
nicosulfuron @ 0.031 lb/A	Accent Q @ 0.9 oz/A Apply with COC @ 1 qt/100 gal or NIS @ 2 pt/100 gal plus 2 qt/A UAN; consult label for correct adjuvant system when mixing with other herbicides.	Annual grasses, johnsongrass, pigweeds and morningglories. Can be erratic on broadleaf signalgrass, crabgrass and yellow foxtail.	Apply to corn up to 20 inches tall. Do not broadcast after the 6 leaf stage. Can be applied with drop nozzles up to 36 inches tall (V10) corn; consult label. Do not apply to corn treated with Counter 15 G; consult label. Tank-mixing Accent Q with atrazine at 1.0 lb/A and/or glyphosate (Roundup Ready corn) will broaden the spectrum of weeds controlled. If tank-mixed with atrazine, observe 12-inch corn application limit. See the Accent Q label for other tank-mixtures.
pyroxasulfone @ 0.081 – 0.195 lb/A + fluthiacet-methyl @ 0.002 – 0.006 lb/A	Anthem @ 5-8 oz/A on coarse soil 6-9 oz/A on medium soil 7-12 oz/A on fine soil Apply with NIS @ 1qt/100 gal, COC or MSO @ 1gal/100 gal	Most annual grasses and broadleaf weeds	Apply before corn exceeds V4 growth stage. Better results if applied for residual control of weeds. May also be used before or at planting; consult label. An 18-month crop rotation restriction for all crops other than corn. Tank-mixing Anthem with atrazine at 1.0 lb/A, glyphosate (Roundup Ready corn) and/or Liberty (Liberty Link corn) will broaden the spectrum of weeds controlled. See the Anthem label for other tank-mixtures.
toporamazone @ 0.016 lb/A	Armezon or Impact @ 0.75 oz/A Apply with MSO or COC @ 1 gal/100 gal and 28%-32% UAN @ 1.25-2.5 gal/100 gal or AMS @ 8.5- 17 lb/100 gal.	Annual grasses and broadleaf weeds	Apply to corn up V8 growth stage. Tank-mixing Armezon or Impact with atrazine at 1.0 lb/A, glyphosate (Roundup Ready corn) and/or Liberty (Liberty Link corn) will broaden the spectrum of weeds controlled. If tank-mixed with atrazine, observe 12-inch corn application limit. See the Armezon or Impact label for other tank-mixtures.

CORN WEED MANAGEMENT

CORN^{1,2}

Active Ingredient and Rate ¹	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE continued:			
atrazine @ 2.0 lb/A	90 DF formulations @ 2.2 lb/A 4L formulations @ 2 qt/A Apply with COC @ 1 gal/100 gal	Most broadleaf weeds and some grasses; grasses must be very small to obtain control.	Apply before weeds exceed 1.5 inches or corn exceeds 12 inches in height. Do not exceed 2.5 lb ai/A atrazine per season. Do not graze or feed forage from treated areas to livestock for 21 days after treatment. Tank-mixing atrazine with glyphosate (Roundup Ready corn) or Liberty (Liberty Link corn) will broaden the spectrum of weeds controlled. See the atrazine label for other tank-mixtures.
S-metolachlor @ 0.75-1.25 lb/A + atrazine @ 1.0-1.63 lb/A	Bicep II Magnum @ 1.3 qt/A on coarse soil 1.6 qt/A on medium soil 2.1 qt/A on heavy soil	Most small seeded annual grasses and broadleaf weeds	See comments for atrazine and S-metolachlor above. Apply before weeds emerge and corn reaches the V4 growth stage or 12 inches in height. Do not apply with liquid fertilizer. Tank-mixing atrazine with glyphosate (Roundup Ready corn) or Liberty (Liberty Link corn) will broaden the spectrum of weeds controlled. See the Bicep II Magnum label for other tank-mixtures.
mesotrione @ 0.094 lb/A	Callisto @ 3 oz/A Apply with COC @ 1 gal/100 gal	Many broadleaf weeds, including copperleaf, broadleaf signalgrass (<2 inches) and large crabgrass (<2 inches); weak on most grasses; Callisto alone will not control prickly sida and most morningglories.	Apply before weeds are 4 inches tall. Has excellent residual weed control, so early applications are encouraged. Do not use if Counter was used at planting; consult label for other use restrictions. Do not tank-mix with MSO blend adjuvants. Tank-mixing Callisto with atrazine at 1.0 lb/A, glyphosate (Roundup Ready corn) and/or Liberty (Liberty Link corn) will broaden the spectrum of weeds controlled. See the Callisto label for other tank-mixtures.
thiencarbazone-methyl @ 0.13 lb/A + tembotrione @ 0.07 lb/A	Capreno @ 3 oz/A Apply with COC @ 1 gal/100 gal	Seedling and rhizome johnsongrass. Most annual grasses and broadleaf weeds.	Apply before corn exceeds 12 inches in height. Corn injury may occur if rainfall does not occur within 3 weeks after application. Do not use on fields treated with Counter; consult label. Tank-mixing Capreno with atrazine at 1.0 lb/A, glyphosate (Roundup Ready corn) and/or Liberty (Liberty Link corn) will broaden the spectrum of weeds controlled. See the Capreno label for other tank-mixtures.
dicamba @ 0.25-0.5 lb/A	Clarity or Banvel @ 0.5 pt/A on coarse soil 1.0 pt/A on med-heavy soil Apply with NIS @ 1 pt/100 gal; consult label for precautions	Most broadleaf weeds	Apply after corn emergence before the 5 th leaf stage or corn is 8 inches tall. During periods of rapid growth temporary leaning may occur. Do not cultivate until corn recovers. Do not use crop oil. May be used on corn 8-24 inches tall at a reduced rate; consult label. Tank-mixing Clarity or Banvel with atrazine at 1.0 lb/A and/or glyphosate (Roundup Ready corn) will broaden the spectrum of weeds controlled. See the Clarity or Banvel label for other tank-mixtures.
glyphosate ⁵ @ 0.94-1.05 lb/A + S-metolachlor @ 0.94-1.05 lb/A + mesotrione @ 0.09-0.11 lb/A	Halex GT ⁵ @ 3.6 – 4.0 pt/A Apply with NIS @ 1-2 qt/100 gal plus AMS 8.5-17 lb/100 gal	Most annual grass and broadleaf weeds; good residual control is tank-mixed with atrazine.	Roundup Ready Corn Only. Apply from emergence 30-inch tall corn or V8 growth stage. Do not use Halex GT if another HPPD inhibitor such as Callisto, Impact or Laudis has or will be used. Do not use on fields treated with Counter. Tank-mixing Halex GT with atrazine at 1.0 lb/A will broaden the spectrum of weeds controlled.

CORN WEED MANAGEMENT

CORN^{1,2}

Active Ingredient and Rate ¹	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE continued:			
tembotrione @ 0.08 lb/A	Laudis @ 3 oz/A Apply with MSO @ 1 gal/100 gal	Many broadleaf weeds. Laudis alone will not control most morningglories.	Apply before weeds are 4 inches tall. Do not use if Counter was used at planting. Consult label for other use restrictions. Tank-mixing Laudis with atrazine at 1.0 lb/A, glyphosate (Roundup Ready corn) and/or Liberty (Liberty Link corn) will broaden the spectrum of weeds controlled. See the Laudis label for other tank-mixtures.
S-metolachlor @ 1.3 lb/A + atrazine @ 1.3 lb/A + mesotrione @ 0.168 lb/A	Lexar EZ @ 3 qt/A	Most small seeded grasses and broadleaf weeds	See comments in preemergence section. Apply before weeds emerge and corn is 12 inches tall. If weeds are present, apply with NIS at 1 qt/100 gal. Do not apply with liquid fertilizer. Tank-mixing Lexar EZ with glyphosate (Roundup Ready corn) or Liberty (Liberty Link corn) will broaden the spectrum of weeds controlled. See the Lexar EZ label for other tank-mixtures.
glufosinate ⁶ @ 0.40 lb/A	Liberty 280 @ 22 oz/A	Many annual grasses and broadleaf weeds. Adhere to weed size restrictions on label or unsatisfactory control will result.	Liberty Link Corn Only. Apply from emergence through V5. Apply before weeds are 2-3 inches tall with atrazine at 1.0 lb/A and/or residual grass herbicides. Refer to label for approved tank-mixes. Will not control large escaped grasses. Make no more than 2 applications per year. Do not apply more than 44 oz/year.
halosulfuron-methyl @ 0.032-0.063 lb/A	Permit 75WG @ 0.67-1.33 oz/A Apply with NIS @ 1 qt/100 gal or COC @ 1 gal/100 gal	Purple and yellow nutsedge, common cocklebur	Apply to spiking corn thru layby. Do not exceed two applications with a total of 2 2/3 oz/A/season Permit. May tank-mix with other herbicides for broad-spectrum weed control; consult label. Consult label for recrop intervals and other information.
rimsulfuron @ 0.02 lb/A + mesotrione @ 0.08 lb/A	Realm Q @ 4 oz/A Apply with COC @ 1 gal/100 gal or NIS @ 1 qt/100 gal	Most annual grasses and broadleaf weeds	Do not apply to corn taller than 20 inches or plants with 7 or more collars. Do not apply to sweet corn. Do not tank-mix with organophosphate insecticide. Apply organophosphate insecticide either 7 days before or 3 days after Realm Q application. Tank-mix with atrazine, glyphosate or Liberty to broaden spectrum of weeds controlled. Glyphosate and Liberty in Roundup Ready or Liberty Link corn hybrids, respectively.
rimsulfuron @ 0.014 lb/A + thifensulfuron-methyl @ 0.003	Resolve Q @ 1.25 oz/A Apply with COC @ 1 gal/100gal + 2 qt/A UAN	Improved grass and broadleaf weed control when mixed with other herbicides; consult label. Provides some residual control.	Apply to corn up to 20 inches tall or that has no more than 7 collars. An activating rainfall within 5-7 days of application is required for residual control. Do not use on fields treated with Counter; consult label. Tank-mixing atrazine at 1 lb/A and/or glyphosate (Roundup Ready corn) will broaden the spectrum of weed controlled.
glyphosate ^{4,5} @ 0.7-1.0 lb/A	Roundup PowerMax @ 22 oz/A Touchdown Total @ 24 oz/A 4L formulations @ 32 oz/A	Most annual grasses and broadleaf weeds	Roundup Ready Corn Only. Apply from corn emergence until 8 leaves with collars (or 30 inches). Consult product labels for glyphosate products cleared on Roundup Ready corn. Consult label for maximum use rate per year restrictions.

CORN WEED MANAGEMENT

CORN^{1,2}

Active Ingredient and Rate ¹	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE continued:			
dicamba @ 0.138-0.276 lb/A + diflufenzopyr @ 0.05-0.1 lb/A	Status @ 5-10 oz/A Apply with NIS @ 1 qt/100 gal or COC @ 1-2 pt/A or MSO @ 1-2 pt/A	Most broadleaf weeds	Apply after corn is 4 inches tall (V2) up to 36 inches (V10). Do not apply within 15 days of tassel emergence. Do not mix with 2,4-D or more dicamba. Do not mix with EC formulation herbicides. Do not apply to stressed or injured corn. Tank-mixing Status with atrazine at 1.0 lb/A, glyphosate (Roundup Ready corn) and/or Liberty (Liberty Link corn) will broaden the spectrum of weeds controlled.
nicosulfuron @ 0.023 lb/A + rimsulfuron @ 0.012 lb/A	Steadfast Q @ 1.5 oz/A Apply with COC @ 1 qt/100 gal or MSO @ 2 pt/100 gal or NIS @ 2 pt/100 gal plus 2 qt/A UAN; consult label for correct adjuvant system when mixing with other herbicides.	Most annual grasses, johnsongrass and some broadleaf weeds. Better on annual grasses than Accent alone.	Apply to corn up to 20 inches tall. Do not apply after the V5 growth stage. Do not apply to corn treated with Counter 15 G; consult label for other restrictions. Tank-mixing Accent Q with atrazine at 1.0 lb/A and/or glyphosate (Roundup Ready corn) will broaden the spectrum of weeds controlled. If tank-mixed with atrazine, observe 12-inch corn application limit. See the Steadfast Q label for other tank-mixtures.
halosulfuron-methyl @ 0.031- 0.062 lb/A + dicamba @ 0.14- 0.28 lb/A	Yukon 67.5 WSG @ 4-8 oz/A Apply with NIS Apply with NIS @ 1 qt/100 gal or COC @ 1 gal/100 gal	Nutsedge, morningglories, ragweed	Apply at spike to 36-inch corn. Do not exceed 8 oz/A/season. May tank-mix with other herbicides for broad spectrum weed control; consult label. Consult label for recrop intervals and other information.
DIRECT POSTEMERGENCE/LAYBY:			
paraquat @ 0.26-0.64 lb/A	Paraquat (2 lb/gal formulation) @ 16-40 oz/A; Paraquat (3 lb/gal formulation) @ 11-27 oz/A Apply with NIS @ 1 qt/100 gal	Annual grasses and weeds less than 4 inches tall	Apply after corn is 10 inches tall. Directed spray only. Avoid all spray contact with corn foliage. Use low pressure and large droplets. Use 20-40 GPA.
atrazine @ 1-2 lb/A	80 DF formulations @ 1.25-2.5 lb/A 90 DF formulations @ 1.1-2.2 lb/A 4L formulations @ 1-2 qt/A 5L formulations @ 0.8-1.6 qt/A	Most annual weeds	Apply after last cultivation when corn is 20-30 inches tall. Use drop nozzles to keep spray off corn leaves. Do not exceed a total of 2.5 lb/A/ season. Apply in 10-20 GPA.
linuron @ 0.63-1.5 lb/A	Linex/Lorox 4L @ 1.25-3 pt/A Apply with NIS @ 2 qt/A	Most annual weeds	Apply when corn is at least 15 inches tall and weeds are not more than 8 inches tall. Use as a directed spray. Foliar burn of corn may result from contact by spray. Do not apply to sandy or sandy loam soils. Apply in 20 GPA. Consult label for recrop intervals and other information.
diuron @ 0.6 - 0.75lb/A	Karmex DF @ 0.75-1.0 lb/A Direx 4L/Diuron 4L @ 1.25-1.5 pt/A	Most annual weeds	Apply after last cultivation when corn is 20 to 30 inches tall. Do not apply over top of corn. Apply as directed spray. Add surfactant if small weeds are present. Apply lower rate to light soil. Apply in 20 gal water per acre.

CORN WEED MANAGEMENT

CORN^{1,2}

Active Ingredient and Rate ¹	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
HARVEST AIDS:			
carfentrazone @ 0.016-0.031 lb/A	Aim @ 1-2 oz/A Apply with COC @ 1 gal/100 gal	Better on vines than pigweed, sicklepod, etc.	Apply after grain has begun to dry down. Use a minimum volume of 10 gallons by ground and 5 gallons by air. Do not apply within 3 days of harvest.
paraquat @ 0.3-0.5 lb/A	Paraquat (2 lb/gal formulation) @ 1.2-2 pt/A; Paraquat (3 lb/gal formulation) @ 0.8-1.3 pt/A Apply with NIS @ 1 qt/100 gal	Grasses and broadleaves	Apply after black layer has formed. Use a minimum of 20 gallons by ground or 5 gallons by air. Apply at least 7 days prior to harvest.
sodium chlorate @ 6 lb/A	6 lb/gal formulation @ 1 gal/A 5 lb/gal formulation @ 1.2 gal/A 3 lb/gal formulation @ 2 gal/A	Desiccation of green vegetation	Apply to corn field where grasses make harvest difficult. Apply at least 14 days before anticipated harvest date on clear days when temperatures are expected to exceed 70°F. DO NOT graze treated fields or feed fodder, forage or residual seeds within 14 days of application.

¹ Suggestions are for field corn grown for grain. Consult labels before using these herbicides on corn grown for seed or silage.

² Refer to the burndown section of this guide for suggestions on managing cool season weeds.

³ Metolachlor contains a 1:1 ratio of two metolachlor isomers (-R and -S). S-metolachlor contains only the -S isomer. The -S isomer has greater herbicidal activity than the -R isomer. On the herbicide label, the -R isomer is denoted by metolachlor while the -S isomer is denoted by acetamide -(s). Alternatively, if the trade names Bicep or Dual include the word "Magnum," the -S isomer is an active ingredient. If the trade name does not include "Magnum", the metolachlor -R:-S isomer ratio is 1:1.

⁴ See "Appendix A" for glyphosate products and their surfactant requirements.

⁵ For use only in Roundup Ready corn hybrids.

⁶ For use only in Liberty Link corn hybrids.

COTTON WEED MANAGEMENT

TABLE 1. Effectiveness of selected cotton herbicides four week after application.

	hophornbeam copperleaf	smellmelon	bermudagrass	rhizome johnsongrass	seedling johnsongrass	annual grasses	yellow nutsedge	prickly sida	pigweed	morningglory	hemp sesbania	sicklepod
PREEMERGENCE HERBICIDES:												
Command 3ME	6	6	3	9	8	9	0	8	4	6	1	2
Cotoran, Meturon or Fluometuron	9	9	0	7	7	8	0	8	9	8	8	7
S-metolachlor/metolachlor (all formulations)	1	1	0	7	6	8	-	4	8	4	3	2
Diuron	7	7	0	7	6	7	0	7	9	6	7	8
Treflan or Prowl	1	1	2	9	8	9	0	2	8	4	1	2
Solicam DF	7	8	3	7	6	8	4	8	8	6	5	-
Treflan or Prowl + Cotoran,	9	9	0	9	9	9	0	8	9	9	8	7
Treflan, or Prowl + Diuron	8	8	0	9	9	9	0	7	9	8	8	8
Treflan or Prowl + Solicam DF	8	9	3	9	9	8	4	8	9	6	5	-
Staple LX + Cotoran	9	9	0	9	7	8	3	9	9	8	8	8
POSTEMERGENCE HERBICIDES:												
Aim/ET	-	8	0	0	0	0	0	0	8	9	9	6
Aim/ET + MSMA	5	5	0	4	8	8	8	7	8	9	9	8
Aim/ET + glyphosate	9	9	7	8	9	9	7	8	9	9	9	9
Assure II	0	0	8	8	9	9	0	0	0	0	0	0
Cobra + MSMA	9	9	0	6	9	7	6	8	9	9	8	6
Cotoran, Meturon or Fluometuron	8	8	0	4	7	6	3	6	7	5	5	6
Caparol or Cotton-Pro	8	8	0	4	8	7	5	7	8	8	6	7
Caparol or Cotton-Pro + MSMA	9	9	0	4	9	8	7	8	9	9	7	8
Cotoran + MSMA	9	9	0	4	8	8	6	7	9	8	6	8
Envoke	8	9	0	6	6	5	8	3	9	8	8	8
Fusilade DX	0	0	8	8	9	9	0	0	0	0	0	0
glyphosate ^{1,2}	9	9	7	8	9	9	7	8	9	8	8	8
glyphosate ^{1,2} + Warrant	9	9	7	8	9	9	7	8	9	8	8	8
Goal + MSMA	9	9	0	5	9	8	7	7	8	9	7	8
Liberty 280 SL ³	10	10	6	8	9	9	4	9	9	10	9	9
Liberty 280 SL ³ + Dual Magnum	10	10	6	8	9	9	4	9	9	10	9	9
Liberty 280 SL ³ + Staple LX	10	10	6	8	9	9	4	9	9	10	9	9
diuron	7	7	0	4	8	6	0	7	8	7	6	8
diuron + MSMA	8	8	0	4	9	9	7	8	9	8	6	8

COTTON WEED MANAGEMENT

TABLE 1 continued: Effectiveness of selected cotton herbicides four weeks after application.

	hophornbeam copperleaf	smellmelon	bermudagrass	rhizome johnsongrass	seedling johnsongrass	annual grasses	nutsedge	prickly sida	pigweed	morningglory	hemp sesbania	Sicklepod
POSTEMERGENCE HERBICIDES continued:												
Linex + MSMA	9	9	0	4	9	8	6	8	9	9	7	8
Poast Plus	0	0	8	8	9	9	0	0	0	0	0	0
Select Max/other clethodim formulations	0	0	8	8	9	9	0	0	0	0	0	0
Sequence	9	9	7	8	9	9	7	8	9	8	8	8
Staple LX	2	4	0	4	6	5	5	8	9	8	8	6
Staple LX + glyphosate	9	9	7	8	9	9	7	9	9	9	9	8
Suprend	8	9	0	4	8	7	8	7	9	8	8	8
Valor	9	9	0	0	0	0	3	8	9	9	9	8

¹ For use only in Roundup Ready and GlyTol/Liberty Link varieties.

² See Appendix A for various glyphosate products.

³ For use only in Liberty Link and GlyTol/Liberty Link varieties.

COTTON WEED MANAGEMENT

COTTON

Active Ingredient and Rate	Active Ingredient and Rate	Weeds Controlled	Remarks and Precautions
PREPLANT¹:			
S-metolachlor @ 1.0 - 1.9 lb/A	Dual Magnum @ 1.33-1.67 pt/A	Italian ryegrass	Apply to prepared seedbeds between September 1 st and December 1 st . Best control is generally observed from late October to mid-November. Will not control emerged ryegrass. Mix with paraquat to control emerged ryegrass. Incorporation will be beneficial if an activating rainfall is not received soon after application. Don't incorporate deeper than 2-3 inches. The maximum combined fall and spring metolachlor rate is 2.54 pt/A.
flumioxazin @ 0.032 - 0.064 lb/A	Valor @ 1 – 2 oz/A	Residual control of pigweed and control and/or partial control of other broadleaf weeds. Mix with other herbicides to burn-down existing vegetation.	Apply 30 days before planting. Do not plant until at least 1 inch of rainfall or overhead irrigation has been received following application.
fomesafen @ 0.25 lb/A	Reflex 2 EC @ 1 pt/A	Residual control of pigweed and control and/or partial control of other broadleaf weeds, sedges and grasses. Mix with other herbicides to burndown ¹ existing vegetation.	Apply 14-21 days before planting. Do not plant until at least 1/2 inch of rainfall or overhead irrigation has been received following the application. Plant at least 0.75 inch deep. Do not use on light/coarse textured soils. Cotton plants may exhibit some crinkling or spotting on foliage or stunting, but plants normally outgrow these effects.
PREPLANT INCORPORATED:			
pendimethalin @ 0.50 - 1.5 lb/A	Prowl 3.3 EC/Pendimax 1.2-1.8 pt/A on coarse soil 1.8- 2.4 pt/A on medium soil 2.4-3.6 pt/A on heavy soil	Most annual grasses, seedling johnsongrass and fair control of some broadleaf weeds	Apply before planting and incorporate up to 1/2 inch deeper than the seed is planted. Incorporation will be necessary if sufficient rainfall is not received within 7 days.
	Prowl H2O @ 1-2 pt/A on coarse soil 2 pt/A on medium soil 3 pt/A on heavy soil		
trifluralin @ 0.5 - 1.5 lb/A	Treflan, Trifluralin, and other 4L formulations @ 1-1.5 pt/A on coarse soil 1.5- 2 pt/A on medium soil 3 pt/A on heavy soil	Most annual grasses, johnsongrass from seed and fair control of some broadleaf weeds	Apply prior to or after planting. Incorporate up to 1/2 inch deeper than seed if applied preplant or almost to seed if applied after planting.

COTTON WEED MANAGEMENT

COTTON

Active Ingredient and Rate	Active Ingredient and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE:			
clomazone @ 0.5 - 1.25 lb/A	Command 3 ME @ 1.3 - 3.3 pt/A	Most annual grasses and good control of prickly sida, wild poinsettia, spurred anoda, velvetleaf and itchgrass	Apply before or after planting. Requires the use of disulfoton or phorate applied in furrow to "safen" cotton from injury. Read and follow label instructions concerning application conditions and buffer zones to reduce nontarget drift injury. Excessive rainfall at planting may lead to injury.
acetochlor @ 1.125 lb/A	Warrant @ 1.5 qt/A	Annual grasses and small-seeded broadleaves	Consult label for rate range considering soil type and O.M. content. Can be applied from emergence through the 4th leaf stage, with optimum being 2-3leaf. Emerged weeds are not controlled and require addition of a labeled postemergence herbicide such as glyphosate or glufosinate. See label for appropriate tank-mix partners and related information.
metolachlor ² @ 0.49 - 1.3 lb/A	Parallel 7.8EC/others @ 0.5-1.0 pt/A on coarse soil 0.67-1.33 pt/A on medium soil 1.0-1.33 pt/A on heavy soil	Most annual grasses and small-seeded broadleaf weeds	Apply after planting before weeds emerge. May also be applied before planting or preplant incorporated. Cotton should be planted 1.5 inches deeper than incorporated zone.
S-metolachlor ² @ 1.5 - 2.0 lb/A	Dual Magnum, Dual II Magnum @ 1.0-1.33 pt/A on medium soil 1.33 pt/A on heavy soil	Most annual grasses and small-seeded broadleaf weeds	Apply after planting before weeds emerge. May also be applied before planting. Cotton should be planted 1.5 inches deeper than incorporated zone.
fluometuron @ 0.8 - 2.0 lb/A	Cotoran 80WP, Meturon 80DF, Fluometuron 80DF @ 1.0 lb/A on light soil 1.5 lb/A on medium soil 2.5 lb/A on heavy soil Cotoran, Meturon 4L @ 0.8 qt/A on coarse soil 1.2 qt/A on medium soil 2.0 qt/A on heavy soil	Most small-seeded annual grasses and broadleaf weeds	Apply at planting. Cover seed at least 1/2 inch deep. Apply to soil surface behind press wheel.
pendimethalin @ 0.5 - 1.5 lb/A	Prowl 3.3, Pendimax @ 1.2-2.4 pt/A on coarse soil 1.8-2.4 pt/A on medium soil 2.4-3.6 pt/A on heavy soil Prowl H2O @ 1-2 pt/A on coarse soil 2 pt/A on medium soil 3 pt/A on heavy soil	Annual grasses and small-seeded broadleaf weeds	Apply at planting. Rainfall required within 7 days for activation. Can be used in no-till or reduced-till cotton where incorporation cannot be used.

COTTON WEED MANAGEMENT

COTTON

Active Ingredient and Rate	Active Ingredient and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE continued:			
pyrithiobac @ 0.03 - 0.05 oz/A + fluometuron @ 0.8 - 2 lb/A	Staple LX @ 1.3- 2.1 fl. oz./A + fluometuron as above	Better control of yellow nutsedge and certain broadleaf weeds	Apply at planting. Best control is achieved with sequential post emergence Staple LX treatments. Follow label directions.
norflurazon @ 1.0 - 2.0 lb/A	Solicam DF @ 1.25 lb/A on light soil 1.9 lb/A on medium soil 2.5 lb/A on heavy soil	Most small-seeded annual grasses and broadleaf weeds. Fair control of nutsedge.	Apply at planting. Can be applied up to 30 days before planting. Can be incorporated before planting at the same rate as the surface application or split 1/2 PPI and 1/2 PRE.
POSTEMERGENCE:			
quizalofop @ 0.06 - 0.15 lb/A	Assure II @ 5 - 10 oz/A Apply with NIS @ 1 qt/100 gal or COC @ 1 gal/100 gal	Annual and perennial grasses	Apply before grasses exceed height for treatment. Use 5-8 oz/A on annual grasses and 10 oz/A on perennial grasses.
trifloxysulfuron-sodium @ 0.0047 - 0.007 lb/A	Envoke @ 0.1-0.15 oz/A. Apply with NIS @ 1 qt/100 gal	Broadleaves (including sicklepod) and sedges; weak on prickly sida	Apply after cotton reaches the five true leaf stage. Do not apply to cotton that is stressed. Do not tank-mix with any EC formulated product as increased injury may be observed. Consult label for approved tank-mixes. Do not tank-mix with grass herbicides as grass control will be reduced. Not labeled for aerial application.
fluazifop @ 0.125 - 0.50 lb/A	Fusilade DX @ 0.37 - 0.75 pt/A Apply with NIS @ 1 qt/100 gal or COC @ 1 gal/100 gal.	Annual and perennial grasses	Apply before annual grasses reach 4 inches and johnsongrass reaches 2 feet. Use the highest rate on bermudagrass with runners. Activity may be reduced if mixed with other herbicides. Use lowest range of rates for shatter cane and seedling johnsongrass.
fenoxaprop-ethyl + fluazifop @ 0.2 lb/A	Fusion @ 10 oz/A. Apply with NIS @ 1 qt/100 gal or COC @ 1 gal/100 gal.	Same as above	Same as above
sethoxydim @ 0.19 - 0.47 lb/A	Poast Plus @ 1.5- 2.25 pt/A Apply with NIS @ 1 qt/100 gal or COC @ 1 gal/100 gal.	Annual and perennial grasses	Apply at 1.5 pt/A before annual grasses reach 4 inches and johnsongrass reaches 2 feet. Use 2.25 pt/A to control bermudagrass with 4- to 6-inch runners. Application to larger grasses or grasses under stress may result in reduced control. Activity may be reduced if mixed with other herbicides.
pyrithiobac @ 0.065 - 0.095 lb/A	Staple LX @ 2.6-3.8 fl. oz/A Apply with NIS @ 1 qt/100 gal	Pigweed, cocklebur, morningglory, prickly sida and other broadleaf weeds	Apply when weeds are small and actively growing. Temporary cotton injury seen as chlorosis (yellowing) may occur following application. Weak on sicklepod. Can be banded. Spray grade nitrogen fertilizer or ammonium sulfate may improve weed control. See label.

COTTON WEED MANAGEMENT

COTTON

Active Ingredient and Rate	Active Ingredient and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE continued:			
clethodim @ 0.09 - 0.25 lb/A	Select Max @ 12-32 oz./A 2 lb/gal formulation @ 6-16 oz/A Apply with NIS @ 1 qt/100 gal or COC @ 1 gal/100 gal	Annual and perennial grasses	Application same as above. See label for rate for specific grass species. Addition of a spray-grade nitrogen fertilizer or ammonium sulfate may further improve weed control. Consult label.
glyphosate ³ @ 0.7 - 1.0 lb/A	Roundup PowerMax @ 22 oz/A Touchdown Total @ 24 oz/A 4L formulations @ 32 oz/A	Most broadleaf weeds and grasses	USE ON ROUNDUP-READY FLEX AND GLYTOL/LIBERTY LINK VARIETIES ONLY: No restriction on cotton size. Larger cotton may interfere with spray coverage, resulting in reduced weed control. Allowing weeds to compete with cotton for an extended period may reduce cotton yield. Can be mixed with insecticides and PGRs. Air induction nozzles may reduce insecticide efficacy. Consult label for maximum application rates. See label for approved formulations. Do not add surfactants or products with surfactants.
glyphosate ³ @ 0.7 - 1.3 lb/A + S-metolachlor ² @ 0.94 - 1.5 lb/A	4 L glyphosate @ 23-36 oz/A + Dual Magnum @ 1 -1.6 pt/A or Sequence 5.25 L @ 2.5-4.0 pt/A	Most broadleaf weeds and grasses	USE ON ROUNDUP READY FLEX AND GLYTOL/LIBERTY LINK VARIETIES ONLY: No restriction on cotton size. See other cautions above. DO NOT mix with Staple LX. Can be applied in first or second overtop application to provide residual control. Do not use additional surfactant. Check label for approved products. Don't exceed 3.5 pt/A/season
glyphosate + pyriithiobac @ 1.0 + 0.021 - 0.032 lb/A	Glyphosate (4 lb/gal formulations) + Staple LX @ 1.0 qt/A + 0.8 - 1.7 oz/A	Most broadleaf weeds and grasses	USE ON ROUNDUP READY FLEX AND GLYTOL/LIBERTY LINK VARIETIES ONLY: No restriction on cotton size. See comments for glyphosate and pyriithiobac tank-mix. DO NOT mix with any metolachlor product. DO NOT exceed a total of 2 oz pyriithiobac/year.
glufosinate @ 0.42 - 0.52 lb/A	Liberty 280 @ 22-29 oz/A	Broadleaves and grasses. Consult label for rates and size restrictions	LIBERTY-LINK AND GLYTOL/LIBERTY LINK VARIETIES ONLY: Apply from cotton emergence to early bloom. Time applications to weed size, not crop stage. Weak on sedges, large goosegrass and signalgrass. Pigweeds may not be effectively controlled if larger than 3-4 inches. Prowl, Dual Magnum, or Staple LX PRE may aid in pigweed control in this system. Do not apply more than 87 oz/A/season or 70 days to harvest. Do not use air-induction spray tips. Apply in a minimum of 15 GPA.

COTTON WEED MANAGEMENT

COTTON

Active Ingredient and Rate	Active Ingredient and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE continued:			
glufosinate @ 0.42 - 0.52 lb/A + pyrithiobac @ 0.021 - 0.032 lb/A	Liberty 280 @ 22-29 oz/A + Staple LX @ 0.8-1.7 oz/A	Most broadleaf weeds and grasses	LIBERTY-LINK AND GLYTOL/LIBERTY LINK VARIETIES ONLY: Broadcast to improve pigweed control. Maximum use rate for pyrithiobac is 2 oz/year.
glufosinate @ 0.42 - 0.52 lb/A + metolachlor ² @ 0.47 - 1.27 lb/A	Liberty 280 @ 22-29 oz/A + Dual Magnum @ 0.5 - 1.33 pt/A	Broadleaves and grasses. Consult label for rates and size restrictions.	LIBERTY-LINK AND GLYTOL/LIBERTY LINK VARIETIES ONLY: See above comments. Apply in a minimum of 15 GPA. Do not use air-induction spray tips. DO NOT mix with Staple LX. Apply at cotton emergence to early bloom. Time applications to weed size, not crop stage.
glufosinate @ 0.78 lb/A	Liberty 280 @ 43 oz/A	Salvage situation if broadleaf and grass weed size is large	LIBERTY-LINK AND GLYTOL/LIBERTY LINK VARIETIES ONLY: See note above. Do not apply more than 87 oz/A/season.
DIRECTED POSTEMERGENCE:			
The following herbicides can be applied singly with a surfactant or in combination MSMA as a directed spray. MSMA use in cotton is limited to two applications per year not to exceed 2 lb/A each. A 50-foot buffer zone is required around permanent water bodies. Glyphosate ⁴ and Liberty 280 can also be tank-mixed with many of the following products according to label directions. Use glyphosate and Liberty 280 with the appropriate herbicide resistant cotton variety.			
carfentrazone @ 0.012 - 0.024 lb/A	Aim 2 EC @ 0.75-1.5 oz/A. Apply with NIS @ 1 qt/100 gal or COC @ 1 gal/100 gal.	Broadleaf weeds	Apply after cotton is 12 inches tall. Avoid contact with cotton above the bark layer. Does not control grasses. Do not apply more than 3.25 oz/A/year as a lay-by or post-direct application. May improve morningglory and sesbania control with glyphosate.
pyraflufen ethyl @ 0.0008125 – 0.00325 lb/A	ET @ 0.5 to 2 oz/A. Apply with NIS @ 1 qt/100gal or COC @ 1 gal/100 gal.	Broadleaf weeds	Apply only with hooded spray equipment to plants with less than 3 inch stem bark. May be applied with post-directed equipment to cotton 18 inches in height and with at least 3 inches stem bark.
fluometuron @ 0.8 - 1.2 lb/A	Cotoran/Meturon, Fluometuron 80DF @ 1.0 - 1.5 lb/A Cotoran/Meturon 4L @ 0.8-1.2 qt/A. Apply with NIS @ 1 qt/100 gal or COC @ 1 gal/100 gal.	Annual seedling grasses and broadleaf weeds	Apply after cotton is 3 inches tall. Two post-applications can be made providing fluometuron was not used pre-. Make one early post- application if fluometuron was used pre-.
lactofen @ 0.19 lb/A	Cobra 2 EC @ 12.5 oz/A. Apply with NIS @ 1 qt/100 gal or COC @ 1 gal/100 gal.	Broadleaf weeds	Apply after cotton is 8 inches tall. Apply as a directed spray only.

COTTON WEED MANAGEMENT

COTTON

Active Ingredient and Rate	Active Ingredient and Rate	Weeds Controlled	Remarks and Precautions
DIRECTED POSTEMERGENCE continued:			
prometryn @ 0.5 - 0.7 lb/A	Caparol 80 WP @ 0.50-0.80 lb/A Caparol 4L/Cotton-Pro @ 0.5-0.7 qt/A. Apply with NIS @ 1qt/100 gal or COC @ 1gal/100 gal.	Annual seedling grassy and broadleaf weeds	Apply after cotton is 3 inches tall. Directed spray only. If MSMA is added, do not apply after first bloom.
diuron @ 0.2 - 0.4 lb/A	Direx 4L @ 0.4-0.8 pt/A Karmex DF @ 4.0-8.0 oz/A. Apply with NIS @ 1qt/100 gal or COC @ 1gal/100 gal.	Annual seedling grasses and broadleaf weeds less than 3 inches tall and actively growing	Apply after cotton is 6 inches tall and actively growing. Directed spray only. If MSMA is added, do not apply after first bloom.
oxyfluorfen @ 0.25 - 0.50 lb/A	Goal 2XL @ 1.0 - 2.0 pt/A Apply with NIS @ 1qt/100 gal or COC @ 1gal/100 gal.	Annual seedling grassy and broadleaf weeds	Apply after cotton is 8 inches tall. Apply as a directed spray. Use low pressure and large droplets. Avoid contact with cotton.
fomesafen @ 0.25 - 0.375 lbs/A	Reflex 2 EC @ 1-1.5 pt/A Apply with NIS @ 1qt/100 gal or COC @ 1gal/100 gal.	Broadleaf weeds	Apply after cotton is at least 6 inches tall. May be used as lay-by or under hooded sprayers. Do not apply Reflex later than 70 days before harvest. Do not apply more than 1.5 pints per acre of Reflex in any year. Avoid spray contact with cotton leaves. May be tank-mixed with other products, especially grass herbicides to provide broad spectrum weed control.
linuron @ 0.50 - 0.75 lb/A	Linex 4L @ 1.0-1.5 pt/A. Apply with NIS @ 1qt/100 gal or COC @ 1gal/100 gal.	Annual seedling grassy and broadleaf weeds	Apply after cotton is 8 inches tall. Apply as a directed spray only.
trifloxysulfuron-sodium @ 0.7 - 0.01 lb/A + prometryn @ 0.8 - 1.2 lb/A	Suprend @ 1-1.5 lb/A. Apply with NIS @ 1qt/100 gal or COC @ 1gal/100 gal	Select grasses and many broadleaves. Good on sicklepod.	Apply after cotton is at least 6 inches tall. May be tank-mixed with diuron, MSMA, glyphosate or Cobra for improved control of existing grasses.
LAYBY (one application):			
diuron @ 0.4 -1.2 lb/A	Karmex 80 DF @ 0.5 lb/A on light soil 1.0 lb/A on medium soil 1.5 lb/A on heavy soil Direx 4L @ 1.5 pt/A on medium soil 2.0 pt/A on heavy soil	Most small-seeded annual grasses and broadleaf weeds. Weak on signalgrass and browntop millet.	Apply when cotton is at least 15 inches tall to a clean field. Apply with four nozzles per row or one flooding nozzle adjusted to completely cover the row but to keep spray off the cotton plants. Actively growing weeds up to 3 inches tall can be controlled by adding surfactant or COC.

COTTON WEED MANAGEMENT

COTTON

Active Ingredient and Rate	Active Ingredient and Rate	Weeds Controlled	Remarks and Precautions
LAY-BY (one application) continued:			
prometryn @ 0.8 - 1.6 lb/A	Caparol 80 WP @ 1.5 lb/A on light soil 1.75 lb/A on medium soil 2.0 lb/A on heavy soil Caparol 4L, Cotton-Pro @ 2.4 pt/A on light soil 2.8 pt/A on medium soil 3.2 pt/A on heavy soil	Most small-seeded annual grasses and broadleaf weeds	Apply when cotton is at least 15 inches tall to a clean field. (Same remarks as for single application of diuron for lay-by.)
linuron @ 0.5 - 1.5 lb/A	Linex 4L @ 1 pt/A on light soil 2 pt/A on medium soil 3 pt/A on heavy soil	Most small-seeded annual grasses and broadleaf weeds	Same remarks as for single application of diuron for lay-by. Use this treatment if fall seeded crops will be grown.
fluometuron @ 1.0 lb/A	Cotoran, Meturon, Fluometuron 80 DF @ 1.25 lb/A Cotoran or Meturon 4L @ 1 qt/A	Most annual grasses with fair control of broadleaf weeds	Apply when cotton is at least 15 inches tall to a clean field. (Same remarks as for single application of diuron for lay-by.)
flumioxazin @ 0.032 - 0.064 lb/A	Valor @ 1- 2 oz/A Apply with NIS @ 1qt/100gal.	Pigweeds, prickly sida, copperleaf, morninglory, sicklepod, cocklebur	Apply post-directed when cotton is at least 16 inches tall and has at least 2 inches of bark. Do not apply more than 2 oz/A/application or more than 4 oz/A/season. Do not use crop oil concentrate, organo-silicant surfactants or methylated seed oils. Valor will control emerged weeds given sufficient spray coverage. Good residual control of broadleaves with suppression of grasses.
SPOT TREATMENT:			
fluazifop-P-butyl @ 1.0 lb/100 gal water	Fusilade DX @ 2 qt/100 gal water. Apply with NIS @ 1qt/100 gal or COC @ 1 gal/100 gal	Johnsongrass	Same as above Apply to rapidly growing grass 1-2 feet tall. Spray to wet.
clethodim @ 0.33 - 0.67 lb/100 gal water	Select Max @ 44- 88 oz/100 gal water Apply with NIS @ 1qt/100 gal or COC @ 1 gal/100 gal	Same as above	Same as above
sethoxydim @ 1.0 lb/100 gal of water	Poast Plus at 1.0 gal/100 gal water. Apply with NIS @ 1 qt/100 gal	Johnsongrass	Same as above Apply to rapidly growing grass 1-2 feet tall. Spray to wet.
glyphosate ³ @ 4 - 8 lb/100 gal of water	Glyphosate (4 lb/gal formulations) @ 1.0-2.0 gal/ 100 gal of water	Grasses or broadleaf weeds	Apply to rapidly growing weeds. Thoroughly wet the weed foliage and keep spray off of the crop plants. May be used as a salvage application after 20 percent cracked bolls.

COTTON WEED MANAGEMENT

COTTON

Active Ingredient and Rate	Active Ingredient and Rate	Weeds Controlled	Remarks and Precautions
ROPE WICK APPLICATIONS:			
glyphosate ³ @ 2.0 lb/1.0 gal of water	Glyphosate (4 lb/gal formulations) @ 0.5 gal/1.0 gal of water	johnsongrass	Apply when johnsongrass is at least 12 inches taller than crop. The rope wick should remain moist for best results. Repeated applications may be necessary.

¹ Refer to the burndown section of this guide for suggestions on managing cool-season weeds.

² Metolachlor contains a 1:1 ratio of two metolachlor isomers (-R and -S). S-metolachlor contains only the -S isomer. The -S isomer has greater herbicidal activity than the -R isomer. On the herbicide label, the -R isomer is denoted by metolachlor while the -S isomer is denoted by acetamide -(s). Alternatively, if the trade names Bicep or Dual include the word "Magnum", the -S isomer is an active ingredient. If the trade name does not include "Magnum", the metolachlor -R:-S isomer ratio is 1:1.

³ See "Appendix A" for glyphosate products and their surfactant requirements.

GRAIN SORGHUM WEED MANAGEMENT

GRAIN SORGHUM

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREPLANT¹:			
dicamba @ 0.25 lb/A	Clarity or Banvel @ 0.5 pt/A	Most broadleaf weeds; see label	Apply at least 15 days prior to planting for emerged weeds. Effective for controlling broadleaf weeds which have emerged before planting: henbit, smartweed, etc. If grass is present, mix with glyphosate or paraquat.
S-metolachlor ² @ 0.9-1.4 lb/A	Dual Magnum/Cinch @ 1-1.6 pt/A	Yellow nutsedge, annual grasses, pigweed	Use with Concep treated grain sorghum seed only. Incorporate thoroughly in top 2 inches within 14 days of planting. If broadleaf weeds emerge, use 2,4-D or atrazine postemergence.
dimethenamid-P @ 0.56-0.98 lb/A	Outlook 6L @ 12-21 oz/A	Yellow nutsedge, annual grasses, pigweed	Use with Concep treated grain sorghum seed only. Apply up to 45 days preplant.
PREEMERGENCE:			
atrazine @ 2.0 lb/A	90 DF formulations @ 2.2 lb/A 4L formulations @ 2 qt/A Reduce rate by 25% on highly erodible soils.	Most annual small-seeded broadleaf weeds and some grasses	Apply after planting before weeds and crop emerge. Do not apply to soils with less than 1% OM or to soils of lighter texture than silt loams. Only sorghum or corn should be planted within 1 year on soil treated with atrazine. Do not exceed 2.0 lb ai/A/applications or 2.5 lb ai/A/year. Follow the label concerning maximum atrazine rates.
S-metolachlor ² @ 1.0-1.9 lb/A	Dual II Magnum, Dual Magnum, Cinch @ 1.0-1.33 pt/A on light soil 1.33-1.5 pt/A on medium soil 1.33-1.67 pt/A on heavy soil	Most annual grasses and some broadleaf weeds	Apply after planting before weeds and crop emerge. Do not apply to light soils or any soils with less than 1% organic matter. Use with Concep treated grain sorghum seed only.
S-metolachlor @ 0.75-1.25 lb/A + atrazine @ 1.0-1.63 lb/A	Bicep II Magnum @ 1.6 qt/A on medium soil 2.1 qt/A on heavy soil	Most small-seeded annual grasses and broadleaf weeds	Apply after planting before weeds and crop emerge. See comments for atrazine and s-metolachlor. Use Bicep Lite if another atrazine application will be needed at layby. Do not use on coarse textured soils. Use with Concep treated grain sorghum seed only. Injury can occur if applied when soils are cool and wet during early growth of grain sorghum.
S-metolachlor @ 1.3 lb/A + atrazine @ 1.3 lb/A + mesotrione @ 0.168 lb/A	Lexar EZ @ 3 qt/A	Most small-seeded grasses and broadleaf weeds	Can be applied preplant (up to 21 days before planting) to preemergence. Use with Concep treated grain sorghum seed only. Do not apply to sand, sandy loam or loamy sand soils. Do not apply to forage sorghum, sweet sorghum, sudangrass or sorghum-sudangrass, or dual-purpose sorghum. Postemergence application will cause severe grain sorghum injury. Injury can occur if applied when soils are cool and wet during early growth of grain sorghum.

GRAIN SORGHUM WEED MANAGEMENT

GRAIN SORGHUM

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE continued:			
saflufenacil @ 0.02-0.05 lb/A + dimethenamid-P @ 0.16-0.39 lb/A	Verdict @ 4-10 oz/A on light soils 6-12 oz/A on medium and heavy soils	Small-seeded grasses and broadleaf weeds	Can be applied preplant to preemergence. Rates depend upon soil texture. Use with Concep treated grain sorghum seed only. Postemergence application to grain sorghum will cause severe injury. Injury can occur if applied when soils are cool and wet during early growth of grain sorghum.
POSTEMERGENCE:			
2,4-D amine @ 0.5 lb/A	2,4-D amine @ 1.0 pt/A	Small broadleaf weeds	Apply after sorghum is 4-6 inches tall until flowering. Use directed application taken care to keep 2,4-D out of whorl once sorghum is 10-12 inches tall. Do not use when sorghum is flowering.
atrazine @ 1.0-2.0 lb//A	90 DF formulations @ 1.11-2.2 lb/A 4L formulations @ 1-2 qt/A Apply with COC @ 1gal/100gal	Most effective on broadleaf weeds	Apply before weeds are 1.5 inches tall and after sorghum is 4-6 inches tall. Weeds larger than 1.5 inches tall may not be killed. Do not apply to sandy loam or lighter soil textures. Preferred application as directed spray but may be applied overtop where sorghum is not under stress. Sorghum should not be grazed within 21 days. Do not exceed 2.5 lb ai/A/season. Follow label restrictions on maximum atrazine rates.
dicamba @ 0.25 lb/A	Clarity or Banvel @ 0.5 pt/A	Most broadleaf weeds; see label	Apply at Spike to 15-inch tall sorghum. Optimal timing is 3-5 leaf sorghum, when weeds are less than 3 inches tall. Effective for controlling small broadleaf weeds like morningglory, smartweed, etc. Mixing with atrazine adds to residual control (up to 12 inches tall sorghum). Use drop nozzles if sorghum is taller than 8 inches.
quinclorac @ 0.25-0.375 lb/A + atrazine @ 0.5-1.0 lb/A	Facet L @ 22-32 oz/A + 1-2 pt/A atrazine (4L) Apply with COC @ 2 pt/A	Broadleaf weeds controlled by atrazine plus improved grass control	See comments for atrazine plus crop oil above. Facet L can be applied to grain sorghum from emergence up to 12 inches tall. Apply when weeds are small and actively growing. See label.
prosulfuron @ 0.027 lb/A	Peak @ 0.75 oz/A Apply with NIS @ 1 qt/100 gal	Most broadleaf weeds	See crop rotation section on label for precautions about rotational. Do not apply to grain sorghum under stress from moisture or cold weather. Do not apply to sorghum that has been treated with an organophosphate insecticide at planting or within 15 day of postemergence organophosphate insecticide application.

GRAIN SORGHUM WEED MANAGEMENT

GRAIN SORGHUM

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE continued:			
halosulfuron @ 0.031-0.047 lb/A	Permit @ 0.67-1.0 oz/A Apply with COC @ 1 gal/100gal or NIS @ 1 qt/100 gal	Selected broadleaves and sedges	Apply to sorghum 2-leaf to layby (before grain head emergence). Use only a single application with the total rate not to exceed 1.0 oz/A per season.
halosulfuron @ 0.031-0.047 lb/A + dicamba @ 0.14-0.21 lb/A	Yukon 67.5 WSG @ 4- 6 oz/A Apply with NIS @ 1 qt/100 gal or COC @ 1 gal/100gal	Nutsedge, morningglories, common ragweed	Apply to 2-leaf to 15-inch sorghum. Do not exceed 8 oz/A/season.
bromoxynil @ 0.18-0.22 lb/A + pyrasulfotole @ 0.03-0.39 lb/A	Huskie @ 12.8-16 oz/A Apply with NIS @ 0.25% v/v	Broadleaf weeds	Apply from 3-leaf to 30-inch grain sorghum or until flag leaf emerges. Use high rate for morningglory and pigweed control. Weeds must be small for acceptable results. Expect some temporary injury following application. Atrazine should be tank-mixed to broaden the weed spectrum.
PREHARVEST:			
carfentrazone @ 0.016 lb/A	Aim @ 1.0 oz/A	Desiccation of morningglories	Apply 3 days prior to harvest. Thorough coverage is essential; use at least 10 GPA. Tank-mixture can include sodium chlorate.
glyphosate ³ @ 0.77-1.0 lb/A	Roundup PowerMax @ 22 oz/A Touchdown Total @ 24 oz/A 4L formulations @ 32 oz/A	Grass and broadleaf weeds, grain sorghum regrowth	May be applied prior to harvest after grain sorghum has reached 30% moisture or less. Allow a minimum of 7 days preharvest interval. Not recommended for grain sorghum grown for seed. Consult label.
sodium chlorate @ 6 lb/A	6 lb/gal formulation @ 1 gal/A 5 lb/gal formulation @ 1.2 gal/A 3 lb/gal formulation @ 2 gal/A	Desiccation of green vegetation.	Apply 7-10 days prior to harvest. Follow label directions.
Spot treatment for control of johnsongrass and other weeds. Mix 1-2 gal. of Roundup Ultra ⁴ per 100 gal. of water. Spray weeds to point of drip before grain sorghum heads. Sprayed sorghum and weeds will be killed. Apply with caution to prevent excessive crop injury.			

¹ Refer to the burndown section of this guide for suggestions on managing cool-season weeds.

² Dual is manufactured by Syngenta Crop Protection, has been extensively used in corn production and has the common name metolachlor. When metolachlor is manufactured, it contains a 1:1 ratio of two metolachlor isomers; the -R and the -S isomer. The -S isomer has greater herbicidal activity than the -R isomer, which allows for a reduction in the amount of -S isomer herbicide needed to obtain similar weed control compared to the -R isomer herbicide. To differentiate between metolachlor herbicides containing the -R or -S isomer consult the label under the "active ingredients" section. The -R isomer is denoted by metolachlor while the -S isomer is denoted by acetamide -(s). Alternatively, according to the Syngenta Crop Protection labels, if the trade names Bicep or Dual include the word "Magnum" (Dual Magnum, Dual II Magnum, Bicep II Lite Magnum), the -S isomer is an active ingredient. If the trade name does not include "Magnum", the metolachlor -R:-S isomer ratio is 1:1 (Dual II, Bicep II, Bicep Lite II).

³ See "Appendix A" for glyphosate products and their surfactant requirements.

RICE WEED MANAGEMENT

TABLE I. Effectiveness of selected preplant and preemergence rice herbicides on certain weeds.

	palmleaf morningglory	eclipta	barnyardgrass	red rice	sprangletop	signalgrass	fall panicum	sedge	alligatorweed	ducksalad	redstem	hemp sesbania	waterhyssop	jointvetch	smartweed	dayflower	Texasweed
PREPLANT BURNDOWN:																	
2,4-D	9	9	0	0	0	0	0	5	8	8	9	9	9	8	5	7	9
FirstShot	7	7	0	0	0	0	0	5	9	7	6	8	-	8	9	-	-
Gramoxone SL	8	9	9	8	9	9	9	5 ¹	6	7	9	9	7	8	4	7	9
Grandstand	9	8	0	0	0	0	0	5	9	7	9	9	8	8	5	7	9
LeadOff	5	-	8	6	7	5	8	5	-	-	-	7	-	7	8	-	-
Permit/Halomax	7	8	0	0	0	0	0	9	4	9	9	9	9	9	6	8	8
Roundup	7	8	9	7	9	9	9	7	7	7	9	7	7	7	6	6	9
Sharpen	8	8	0	6	6	5	6	6	7	8	9	8	6	9	7	7	8
PREPLANT INCORPORATED, PREPLANT, PREEMERGENCE or DELAYED PREEMERGENCE:																	
Bolero PPS ²	4	0	8	8	8	7	6	5	4	7	3	0	6	4	5	7	5
Bolero DPRE	5	8	8	0	8	5	7	5	4	8	8	6	8	5	5	8	6
Clearpath	8	8	9	8	8	9	5	9	6	8	8	7	6	7	6	7	8
Command	0	0	9	0	8	8	9	0	0	7	0	0	0	0	2	7	0
Facet PRE (drill-seeded)	8	8	9	0	0	9	5	2	4	3	4	7	6	7	0	5	4
Newpath PPI/PRE	8	6	8	8	8	9	5	9	6	8	8	4	6	4	6	7	8
Obey PRE	8	9	9	0	8	9	8	2	4	7	4	7	6	7	2	7	4
pendimethalin + Facet DPRE	8	8	9	0	9	8	5	4	6	3	2	8	4	7	0	3	6
pendimethalin DPRE	0	0	8	0	8	8	7	0	0	0	0	0	0	0	0	0	0
Sharpen PRE	8	7	4	4	4	4	6	6	4	4	6	7	6	7	6	7	7

¹Annual sedge suppression. ²With proper water management.

RICE WEED MANAGEMENT

TABLE 2. Effectiveness of selected postemergence rice herbicides on certain weeds.

	palmleaf morningglory	ecdipta	barnyardgrass	red rice	sprangletop	signalgrass	fall panicum	sedge	alligatorweed	ducksalad	redstem	hemp sesbania	waterhyssop	jointvetch	smartweed	dayflower	Texasweed
2,4-D amine	9	9	0	0	0	0	0	2 ¹	8	9	9	9	9	7	6	8	9
Aim ³	8	6	0	0	0	0	0	5	5	4	6	9	7	6	8	5	6
Aim + Grandstand	9	8	0	0	0	0	0	5	8	6	9	9	8	9	8	6	7
Basagran	8	8	0	0	0	0	0	8 ⁴	4	8	9	4	8	3	7 ⁴	9	2
Beyond	8	6	8	9	7	9	7	8	3	2	8	3	6	3	5	6	7
Blazer	5	4	0	0	0	0	0	0	4	3	9	9	0	0	0	0	5
Bolero + propanil	5	9	9	0	9	9	8 ⁴	7	5	7 ⁴	7 ⁴	9	9	8 ⁴	6 ⁴	8 ⁴	8
Broadhead	8	9	9	0	0	9	5 ⁴	5	6	4	6	9	7	7	8	5	6
Clearpath	8	9	9	8	6	9	6	8	6	3	3	8	6	8	6	6	7
Clincher ²	0	0	9	0	9	9	8	0	0	0	0	0	0	0	0	0	0
Facet L	8	9	9	0	0	9	5 ⁴	4	6	3	3	8	3	8	0	3	6
Facet L + propanil	8	9	9	0	7 ⁴	9	8 ⁴	5 ¹	6	7 ⁴	7 ⁴	9	8	9 ⁴	6 ⁴	7 ⁴	8
Grandstand	9	8	0	0	0	0	0	5	7	3	9	7	8	8	7	6	9
Grasp	3	7	9	0	3	3	3	8	7	8	8	9	7	7	8	7	6
League	8	8	0	0	0	0	0	8	6	7	8	9	7	8	8	8	8
Londax ²	5	8	0	0	0	0	0	8	7	9	9	6	9	6	6	8	8
Newpath	8	6	8	8	6	9	4	8	3	2	8	3	6	3	4	6	7 ³
Obey	8	9	9	0	8	9	8	2	4	7	4	7	6	7	2	7	4
Permit/Halomax	7 ³	8	0	0	0	0	0	9	4	5	8	9	4	9	4	8	7 ³
Permit Plus	7	9	0	0	0	0	0	9	6	7	9	4	6	9	8	8	7
Permit/Halomax + Londax	7 ³	8	0	0	0	0	0	9	7	9	9	9	9	9	6	8	8
Propanil	5	8	9	0	7 ⁴	9	8 ⁴	4 ¹	5	6 ⁴	7 ⁴	7	8	8 ⁴	6 ⁴	6 ⁴	6
propanil + Aim	9	8	9	0	7 ⁴	9	8 ⁴	6	5	6	7	9	8	9	8 ⁴	6	6
propanil + Londax	9	9	9	0	7 ⁴	9	8 ⁴	9	7	7	9	9	8	9 ⁴	8	8 ⁴	9
propanil + Permit/Halomax	9	9	9	0	7 ⁴	9	8 ²	9	5	5	8	9	9	9	5	8	8 ⁴
pendimethalin + Facet	8	8	9	0	8	9	5 ⁴	4	6	3	2	8	4	7	0	3	6
pendimethalin + propanil	5	9	9	0	9	9	8 ⁴	5	5	7	9	9	8 ⁴	8 ⁴	6 ⁴	7	6
RebelEX	3	7	9 ⁴	0	9 ⁴	9 ⁴	8 ⁴	8	7	8	8	9	7	7	8	7	6
Regiment	8	6	9	0	3	3	0	7 ¹	7	8 ⁴	8	8	7	8	7	7	8
RiceBeaux	5	9	9	0	9	9	8 ⁴	7	5	7 ²	7 ²	9	9	8 ²	6 ²	8 ²	0
Ricestar HT	0	0	9	0	8	9	7 ⁴	0	0	0	0	0	0	0	0	0	0
Sharpen	8	8	0	6	6 ⁴	5 ⁴	6 ⁴	6 ¹	7	8	9	8	6	9	7	7	8 ³
Strada	7	8	0	0	0	0	0	5	5	7	9	9	8	9	6	9	6
Strada PRO	7	8	0	0	0	0	0	9	5	7	9	9	8	9	6	9	6
Strada XT	8	9	9	0	0	9	5 ⁴	8	6	7	8	9	8	9	6	9	6

¹Annual sedge suppression. ²With proper water management. ³Weeds must be <4 inches tall. ⁴Controlled only when small (< 2 leaf).

RICE WEED MANAGEMENT

Table 3. Activity of selective herbicide programs for perennial grass control¹

Herbicide Program	Brook paspalum	Knotgrass	Creeping rivergrass ⁴	Water paspalum	Nealley's sprangletop
Command PRE ²	4	5	4	5	5
Command PRE fb Clincher ³	5	9	8	8	7
Command + Facet PRE ²	4	5	4	5	6
Command + Facet PRE ² fb Clincher ³	5	9	8	9	7
Command PRE fb Grasp ³	5	5	7	5	5
Facet + pendimethalin DPRE ²	4	6	5	7	6
Facet + pendimethalin DPRE fb Clincher ³	6	9	7	9	7
Grasp ³	4	2	6	2	0
Clincher fb Clincher ³	7	9	8	9	8
Newpath fb Beyond ³	7	9	8	8	5
Newpath fb Newpath ³	7	9	8	8	5
Regiment fb Regiment ³	3	2	7	2	4
Ricestar HT fb Ricestar HT ³	3	4	5	6	9
propanil ³	2	3	2	2	6

¹ Control rating is based on herbicides applied to small actively growing plant segments.

² Ratings taken 2 weeks after application.

³ Ratings taken 1 month after application.

⁴ Also referred to as perennial barnyardgrass.

RICE WEED MANAGEMENT

Table 4. Crawfish production and rice herbicides.

2,4-D	May be toxic to aquatic invertebrates.	Londax	Do not harvest crawfish prior to harvesting rice.
Aim	Commercial crawfish not specifically mentioned; however, herbicide is moderately toxic to fish.	Newpath	Crawfish production not specifically mentioned.
Basagran	Do not use Basagran on rice fields in which the commercial cultivation of crawfish is practiced.	Obey	Do not apply on rice fields in which concurrent crawfish or catfish farming are included in the cultural practices.
Beyond	Crawfish production not specifically mentioned.	propanil	Crawfish not specifically mentioned in restrictions. Commercial catfish production prohibited.
Bolero	Crawfish production not specifically mentioned. Toxic to shrimp.	Prowl/pendimethalin	Crawfish not specifically mentioned. Product may be hazardous to aquatic animals.
Broadhead	Do not use treated rice fields for aquaculture of edible fish and crustaceans (crawfish).	Permit/Halomax	Crawfish not specifically mentioned.
Clincher	Do not fish or commercially grown fish, shellfish or crustaceans on treated acres during the year of treatment.	Permit Plus	Crawfish not specifically mentioned.
Clearpath	Do not use treated rice fields for aquaculture of edible fish and crustaceans (crawfish).	Ultra Blazer	Do not harvest crawfish from treated rice areas for food.
Command	Do not apply on rice fields in which concurrent crawfish farming is included in the cultural practices.	RebelEX	Do not fish or commercially grow fish, shellfish or crustaceans on treated acres during the year of treatment.
Duet	Do not apply to fields where commercial crawfish farming is practiced.	RiceBeaux	Applications to fields where catfish/crawfish farming is practiced and draining water from treated fields into areas where catfish farming is practiced is prohibited during 12 months following treatment. Do not use adjacent to catfish/crawfish ponds.
Facet	Do not use treated fields for aquaculture of edible fish or crawfish.	Ricestar HT	Ricestar must not be applied to fields where crawfish are cultured commercially.
Grandstand	Do not commercially grow shellfish or crustaceans on treated acres during the year of treatment.	Roundup and glyphosate formulations	Crawfish production not mentioned in restrictions. Cannot be applied to areas where surface water is present. Refer to individual glyphosate labels.
Grasp	Except for crawfish, do not fish or commercially grow fish, shellfish or crustaceans on treated acres during the year of treatment.	Strada, Strada PRO, Strada XT	Crawfish production not specifically mentioned.
GraspXtra	Do not apply later than three months prior to crawfish production.	Storm Sharpen	Do not use Storm on rice fields where commercial crawfish production is practiced. May be applied to rice fields used for crustaceans, including crawfish production and commercial fish production.

RICE WEED MANAGEMENT

RICE¹

Active Ingredient ² and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREPLANT BURNDOWN:			
2,4-D @ 0.5-1 lb/A	2,4-D @ 1-2 pt of 4 lb/gal material	Most broadleaf weeds	Labels differ between application timing and planting. Follow label restrictions regarding application timing and total amount of 2,4-D applied per season.
paraquat @ 0.6-0.75 lb/A	Gramoxone SL @ 2-3 pt/A Apply with NIS @ 1-2 pt/100 gal	Most annual broadleaf weeds and grasses	Apply near planting and when weeds are less than 6 inches tall. Especially useful on small red rice immediately before flooding to water-seed. Apply 2 days before establishing a flood. Avoid nontarget drift.
triclopyr @ 0.375 lb//A	Grandstand @ 1 pt/A Consult label for adjuvant requirement.	Good on alligatorweed and other perennial broadleaf weeds	Apply 21 days prior to planting. May be useful where 2,4-D use is restricted.
glyphosate @ 0.5-2 lb/A	4 L glyphosate formulations ³ @ 1-4 pt/A	Most annual grasses and many broadleaf weeds	Apply 7-14 days prior to planting. For use in reduced-till or no-till rice. Allow 5-7 days between application and flooding for planting.
thifensulfuron @ 0.0164-0.025 lb/A + tribenuron @ 0.0164-0.025 lb/A	FirstShot @ 0.5-0.8 oz/A Consult label for adjuvant requirement.	Curly dock, henbit, smartweed, garlic	Apply before planting with other burndown products, like glyphosate or paraquat.
rimsulfuron @ 0.0155-0.021 lb/A + tribenuron @ 0.0155-0.021 lb/A	LeadOff @ 1.5-2 oz/A Consult label for adjuvant requirement.	Annual grass and broadleaf weeds; control or suppression of many sedge species	This is a 24C label that was approved Dec. 5, 2012 and will expire Dec. 5, 2017. There is a 60-day recropping restriction for rice with soil pH 6.5 or less at 1.5 oz/A and 90 days at 2 oz/A.
halosulfuron @ 0.031 lb/A	Permit/Halomax @ 0.66 oz/A Consult label for adjuvant requirement.	Sedges, hemp sesbania, jointvetch	Use as part of a preplant or burndown treatment. Safe on soil pH up to 8. May injure rice under certain environmental conditions.
saflufenacil @ 0.04 lb/A	Sharpen @ 2 oz/A Consult label for adjuvant requirement.	Annual broadleaf and grass weeds and suppression of sedges and aquatics	Grasses must be less than 2-3 leaf. Apply in mixture with glyphosate to broaden weed spectrum.
PREPLANT:			
thiobencarb @ 4 lb/A	Bolero 10G @ 40 lbs/A	Barnyardgrass, sedges, partial control of red rice	Apply after flooding before seeding into "clear water." Do not disturb field after application. Do not use if fields were cultivated while flooded.
thiobencarb @ 4 lb/A	Bolero @ 4 pt/A	Barnyardgrass and annual sedges; partial control of red rice; duck salad and waterhyssop on silt loam soils	Apply immediately after soil preparation and before flooding for water-seeding. Apply to seedbed free of vegetation. Field should be flooded, seeded with pre-sprouted seed, drained to optimize stand and re-flooded when seedlings have rooted (within 5 days).

RICE WEED MANAGEMENT

RICE¹

Active Ingredient ² and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE:			
clomazone @ 0.3-0.5 lb/A	Command 3 ME @ 0.8-1 pt/A on light soil 1-1.33 pt/A on heavy soil	Annual grasses	Apply after planting before rice and weeds have emerged. Consult label before applying by air. Adhere to buffer zone restrictions. Medium-grain varieties may be more sensitive to Command.
quinclorac @ 0.25-0.5 lb/A	Facet L @ 22-28 oz/A on light soil 32 oz/A on medium soil 43 oz/A on heavy soil	Barnyardgrass, hemp sesbania, broadleaf signalgrass, morningglory Does not control sprangletop.	Drill-seeded rice only. Apply after planting prior to emergence. Do not use on sand or loamy sand. Injury can occur on rice not covered with soil. Rainfall or flushing needed to activate. No more than 43 oz/A/season.
clomazone @ 0.244-0.488 lb/A+ quinclorac @ 0.244-0.488 lb/A	Obey @ 26-52 oz/A 26-39 oz/A on light soil 39 oz/A on medium soil 52 oz/A on heavy soil	Barnyardgrass, broadleaf signalgrass, fall panicum, sprangletop (spp.), elicpta, jointvetch, morningglory	Apply 14 days before planting through planting but before weed emergence. If weeds emerged before application, consult label for proper adjuvant.
saflufenacil @ 0.04 lb/A	Sharpen @ 2 oz/A Consult label for adjuvant requirement.	Annual broadleaf and grass weeds and suppression of sedges and aquatics	Grasses must be less than 2-3 leaf. Refer to label for proper adjuvant. Apply in mixture with glyphosate to broaden weed spectrum.
DELAYED PREEMERGENCE:			
thiobencarb @ 4 lb/A	Bolero @ 4 pt/A	Barnyardgrass, sprangletop, annual sedges, suppression of broadleaf weeds	Apply after planting dry-seeded rice once soils have been sealed by rainfall or a flush, but 1-5 days before rice emerges. Don't allow soil to dry and crack. Control usually will not exceed three weeks.
quinclorac @ 0.19-0.375 lb/A + pendimethalin @ 1 lb/A	Facet L @ 0.1625-32 oz/A + pendimethalin 3.3 EC @ 2.4 pt/A or Prowl H2O @ 2.1 pt/A	Barnyardgrass, broadleaf signalgrass, sprangletop, morningglory, hemp sesbania, northern jointvetch	Drill-seeded rice only. Apply 4-9 days after planting to soil that has been sealed by rain or a flush. Drain surface water before application. Rice seed exposed to spray may be severely injured. Rice seed must have imbibed water prior to application. Rainfall or flush required for reactivation.
pendimethalin @ 1 lb/A	pendimethalin 3.3 EC @ 2.4 pt/A or Prowl H2O @ 2.1 pt/A	Barnyardgrass, broadleaf signalgrass, sprangletop,	Drill-seeded rice only. Apply 4-9 days after planting to soil that has been sealed by rain or a flush. Drain surface water before application. Rice seed exposed to spray may be severely injured. Rice seed must have imbibed water prior to application. Rainfall or flush required for reactivation.

RICE WEED MANAGEMENT

RICE¹

Active Ingredient ² and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE:			
2,4-D @ 1.25-1.5 lb/A	2,4-D (3.8 L) @ 2.5-3 pt/A	Most broadleaf weeds and seedling sedges	Apply after rice tillers but before panicle initiation. Best application time is at the rice first green ring at beginning of joint elongation but may be applied up to second green ring. Earlier or later applications may result in rice injury. Rice should have a shallow flood at the time of treatment.
carfentrazone @ 0.025-0.05 lb/A	Aim 2 EC @ 1 to 1.6 oz/A	Hemp sesbania, red stem, toothcup, palmleaf morningglory, 1-2 leaf jointvetch	Apply to rice with at least 2-3 leaves and actively growing. Add surfactant only when large weeds are present. Expect injury with high temperatures and humidity.
thiobencarb @ 3 lb/A + propanil @ 3 lb/A	Bolero @ 3 pt/A + propanil @ 3 lb/A (see propanil label for appropriate amount) RiceBeaux @ 4 qt/A	Annual grasses, some sedges, small broadleaf weeds	In dry-seeded rice, apply after emergence if soil is wet. If soil is dry, wait until rice has 2-3 leaves. In water-seeded rice, apply after rice has 2 leaves. Treatment will provide residual activity if field is flushed or flooded within 3 days. Do not submerge rice when applying the permanent flood.
carfentrazone @ 0.00975-0.02 lb/A + quinclorac @ 0.165-0.35 lb/A	Broadhead @ 4-12.1 oz/A	Barnyardgrass, signalgrass, joint Hemp sesbania, red stem, toothcup, palmleaf morningglory, hemp sesbania, one- to two-leaf jointvetch vetch	A prepackaged mixture of quinclorac plus carfentrazone (Aim) for control of broadleaf weeds and grasses. Quinclorac provides residual and postemergence activity and carfentrazone provides postemergence activity. The product is labeled as preplant, preemergence and postemergence to rice. Rice should have 2 leaves before applied postemergence.
bentazon @ 0.75-1 lb/A	Basagran @ 1.5-2 pt/A Consult label for adjuvant requirement.	Redstem, ducksalad dayflower, some sedges	Apply before weeds exceed labeled heights. Lowering of the flood may be necessary to expose weeds to ensure proper coverage. Refer to label for tank-mix options.
clomazone @ 0.3-0.5 lb/A	Command 3 ME @ 0.8-1.33 pt/A Impregnate on 150 lb/A fertilizer	Barnyardgrass, broadleaf signalgrass, junglerice, sprangletop, ducksalad	Water seeded rice only. Apply when rice is pegging and actively growing with 1-2 visible leaves. Allow 24-48 hours before flushing or establishing a pinpoint flood. Hybrids, medium- and short-grain cultivars may be more sensitive.
cyhalofop @ 0.25-0.28 lb/A	Clincher @ 13-15 oz/A Consult label for adjuvant requirement.	Barnyardgrass, broadleaf signalgrass, fall panicum, junglerice, knotgrass, Sprangletop	Apply pre-flood on 1- to 3-leaf grass or post-flood on 1- to 2-tiller grass. Use 13 oz/A when applied early. Use 15 oz/A when applied on larger grasses or perennials. Best activity under saturated soil conditions. Refer to label for approved tank-mixes, additives and adjuvants.

RICE WEED MANAGEMENT

RICE¹

Active Ingredient ² and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE continued:			
quinclorac @ 0.375-0.50 lb/A	Facet L @ 32-43 oz/A Apply with COC @ 2 pt/A	Barnyardgrass, signalgrass, jointvetch, hemp sesbania Suppression of alligatorweed at the highest rate	In water-seeded rice , apply after the 2-leaf rice stage. In dry-seeded rice , apply after emergence. Does not control sprangletop. After application, flushing may be required for reactivation.
quinclorac @ 0.375 lb/A + propanil @ 3 lb/A	Facet L @ 43 oz/A + propanil @ 3 lb/A See propanil label for adjuvant requirement.	Same as above plus increased control of sprangletop, some sedges	For timing, see quinclorac comments above. Follow directions on propanil label for adjuvants.
triclopyr @ 0.375 lb/A	Grandstand @ 1 pt/A Apply with NIS or COC; consult label.	Alligatorweed, Texasweed, jointvetch, other broadleaf weeds Sesbania control is improved with propanil; see label.	Apply when weeds are small. Rice must be in the 3- to 4-leaf to 1/2-inch internode stage. Weak on ducksalad. Overlapping of swaths may result in rice injury. Do not "dress" ends of field. Two applications per season are allowed.
penoxsulam @ 0.032-0.036 lb/A	Grasp @ 2-2.3 oz/A Apply with COC or MSO @ 1 qt/A.	Barnyardgrass, junglerice, ducksalad, annual sedges, small actively growing weeds Little to no control of sprangletop, signalgrass, fall panicum	In drill-seeded rice , apply from emergence up to 60 days before harvest. In water-seeded rice , apply from pegging-one-leaf (no exposed roots) up to 60 days before harvest. Consult label for rates used post-flood or on larger weeds. Refer to label for surface irrigation and permanent flood establishment.
penoxsulam @ 0.032-0.042 lb/A + triclopyr @ 0.25- 0.35 lb/A	Grasp Xtra @ 16-22 oz Apply with COC or MSO @ 1 qt/A.	Barnyardgrass, junglerice, ducksalad, annual sedges, small actively growing weeds	In drill-seeded rice , 2- to 3-leaf to 1/2-inch internode. In water-seeded rice , 3- to 4-leaf to 1/2-inch. Do not apply more than 22 oz/A/year.
imazosulfuron@ 0.15 -0.3 lb/A	League @ 3.2-6.4 oz/A Consult label for adjuvant requirement.	Sesbania, ducksalad, nutsedge	Apply postemergence. Slight injury can occur on medium- and short-grain rice.
bensulfuron @ 0.6-1 oz/A	Londax 60 DF @ 1-1.6 oz/A	Aquatic broadleaf weeds, gooseweed, sedges; suppression of alligatorweed	Apply into flood when weeds are small and submerged. Alligatorweed cannot be well established. Control may be reduced under cold water conditions. Londax may be applied impregnated on dry fertilizer. May not control certain populations of ducksalad.
bensulfuron @ 0.6 oz/A + propanil @ 3-4 lb/A	Londax 60 DF @ 1 oz/A + propanil at 3-4 lb/A See propanil label for adjuvant requirements.	Eclipta, gooseweed, palmleaf morningglory, Texasweed, sedges, grasses	Apply before permanent flood. Good for controlling aquatic weeds where 2,4-D cannot be used.

RICE WEED MANAGEMENT

RICE¹

Active Ingredient ² and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE continued:			
clomazone 0.3-0.488 lb/A + quinclorac 0.3-0.488 lb/A	Obey @ 32-52 oz/A 32 oz/A on light soil 32-43 oz/A on medium soil 43-52 oz/A on heavy soil	Barnyardgrass, broadleaf signalgrass, fall panicum, sprangletop (spp.), elicpta, jointvetch, morningglory	Apply postemergence to rice from the 2- to 5-leaf stage. Application will control emerged and provide residual activity.
halosulfuron @ 0.023-0.063 lb/A	Consult label for proper adjuvant. Permit/Halomax @ 0.5-1.34 oz/A	Sedges, hemp sesbania, jointvetch	Apply after rice emergence to 48 days before harvest. Do not use more than 1.34 oz/A/season. Consult label for post-flood applications.
bensulfuron @ 0.028-0.04 lb/A + halosulfuron @ 0.012-0.023 lb/A	Apply with COC @ 1 qt/A Londax @ 0.75-1 oz/A + Permit/Halomax @ 0.25-0.5 oz/A	Sedges, hemp sesbania, jointvetch, most aquatic weeds	See comments for bensulfuron and halosulfuron. Adjuvant required; consult label.
halosulfuron @ 0.023-0.063 lb/A + propanil @ 3-4 lb/A	Permit/Halomax @ 0.5-1.333 oz/A + propanil at 3-4 lb/A	Sedges, hemp sesbania, jointvetch, grasses	Broad-spectrum weed control. Consult label for post-flood applications.
propanil @ 3-6 lb/A	See propanil label for adjuvant requirements. Sold under various trade names. 4 L/SC/EC @ 3-6 qt/A 80 DF @ 3.5-7 lb/A	Most annual grasses, some sedges, broadleaf weeds in the seedling stage	Apply to grasses before the 4-leaf stage. Usually within 10-14 days after seeding. Use 3 lb for grass in the 1- to 2-leaf stage; add 1 lb for each additional leaf. Use 5-6 lb on 5-leaf-tillering grasses; control usually not satisfactory. Consult label for adjuvants requirement.
bispyribac-sodium @ 0.32-0.63 oz/A	Regiment 80 WP @ 0.4-0.8 oz/A Consult label for adjuvant requirement.	Barnyardgrass, junglerice, nutsedge, small broadleaf weeds; little to no control of sprangletop, signalgrass, fall panicum	Apply to rice that is at least 3 leaves. Barnyardgrass should be 1-leaf-tillering. Broadleaf weeds should be 1- to 4-leaf stage. Controls large barnyardgrass and junglerice and suppresses some perennial Echinochloa species.
saflufenacil @ 0.02 lb/A	Sharpen @ 1 oz/A Consult label for adjuvant requirement.	Annual broadleaf and grass weeds and suppression of sedges and aquatics	Grasses must be less than 2- to 3-leaf. Refer to label for proper adjuvant. Apply in mixture with glyphosate to broaden weed spectrum.
orthosulfamuron @ 0.053-0.065 lb/A	Strada 50 WG @ 1.7-2.1 oz/A Consult label for adjuvant requirement.	Annual sedges, hemp sesbania, jointvetch	Apply after the 2- to 3-leaf rice stage to actively growing weeds with 1-4 leaves. Strada may be mixed with other herbicides to broaden spectrum. See label.
orthosulfamuron @ 0.053-0.065 lb/A + halosulfuron @ 0.0155-0.0186 lb/A	Strada PRO 54 WG @ 2.08-2.5 oz/A Consult label for adjuvant requirement.	Annual sedges, rice flatsedge, yellow nutsedge, hemp sesbania, jointvetch	Apply to emerged weeds from prior to rice emergence until after permanent flood establishment. Do not apply past 1/2-inch internode.

RICE WEED MANAGEMENT

RICE¹

Active Ingredient ² and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE continued:			
orthosulfamuron 0.0406 - 0.0625 lb/A + quinclorac @ + 0.2438 - 0.375 lb/A	Strada XT 70WG 6.5-10 oz/A. Consult label for adjuvant requirement.	Barnyardgrass, broadleaf signalgrass, morningglory, hemp sesbania, flatsedge, northern jointvetch	Apply before or after rain or flushing. Rice seed exposed to spray may be severely injured. Best weed control is obtained if soil surface is smooth and wet, especially on clays. Rice seed exposed to Strada XT may be severely injured. Do not use preemergence in water-seeded rice production.
penoxulam 0.03-0.04 lb/A @ + cyhalofop @ 0.22-0.28 lb/A	RebelEX @ 16-20 oz/A	Barnyardgrass, broadleaf signalgrass, fall panicum, junglerice, knotgrass, sprangletop, ducksalad, hemp sesbania, annual sedges	A prepackaged mixture of Clincher plus Grasp. Apply to small actively growing weeds. Grasses should not exceed the 3-leaf stage to avoid antagonism. Field should be wet for maximum Clincher activity; however, plant should be 75% exposed for Grasp activity.
fenoxaprop @ 0.059-0.109 lb/A	Ricestar HT 0.58 EC @ 13-24 oz/A	Barnyardgrass, broadleaf signalgrass, junglerice, sprangletop	Apply 13 oz/A on 1- to 2-leaf grasses and up to 24 oz/A on larger grasses. Activity decreases on grasses with more than 4 leaves. Do not apply more than 30 oz/A per year. Tank-mix with only approved herbicides. See label.

RICE WEED MANAGEMENT

RICE¹

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
HERBICIDE-TOLERANT RICE:			
acifluofen @ 0.125 lb/A	Ultra Blazer 2 L @ 0.5 pt/A	Hemp sesbania	Apply after sesbania is above rice plants but before sesbania flowers. Do not apply within 50 days of harvest. Refer to label for tank-mixes.
imazamox @ 0.031 to 0.047 lb/A	Apply with NIS @ 1 qt/100 gal Beyond @ 4-6 oz/A POST Consult label for adjuvant requirement.	Red rice, barnyardgrass, broadleaf signalgrass, junglerice, sedges, some broadleaf weeds	Apply after one application of imazethapyr on rice 4-leaf up to 14 days after PI. Approved for tolerant Clearfield rice cultivars and Clearfield hybrids. Refer to label for approved tank-mixes.
imazethapyr @ 0.063 lb/A + quinclorac @ 0.312 lb/A	Clearpath @ 0.5 lb/A Consult label for adjuvant requirement.	Red rice, hemp sesbania, barnyardgrass, broadleaf signalgrass, junglerice, sedges	Apply preplant up to 7 days prior to planting, preemergence, or postemergence (up to 5- leaf rice if drill-seeded and 2-leaf rice if water-seeded). Refer to label for tank-mixes. Must be preceded or followed by a Newpath or Beyond application.
imazethapyr @ 0.063-0.094 lb/A	Newpath @ 4-6 oz/A Consult label for adjuvant requirement.	Red rice, barnyardgrass, broadleaf signalgrass, junglerice	Two applications required. The first application can be lightly incorporated before planting or applied preemergence or at the spike-leaf rice stage. The second application should be applied to 3- to 5-leaf rice or 10-14 days after the spiking treatment. Beyond can be substituted for second application.
SALVAGE TREATMENT:			
halosulfuron @ 0.047-0.063 lb/A	Permit/Halomax @ 1-1.34 oz/A Apply with COC @ 1qt/A	Sedges, hemp sesbania, jointvetch	Apply up to 48 days before harvest. Do not use more than 1.34 oz/A/season.
fenoxaprop @ 0.109 lb/A	Ricestar HT @ 24 oz/A	Barnyardgrass, broadleaf signalgrass, junglerice, sprangletop	Apply to four-leaf-tillering grasses. As grass size increases, activity is delayed.

RICE WEED MANAGEMENT

ADDITIONAL COMMENTS/FOOTNOTES

RATOON CROP HERBICIDES:

*HiDep 2,4-D, Basagran Grandstand and Grasp are also labeled for ratoon (stubble) crop rice. See labels for rates and timing of application. 2,4-D Dacamine production has been discontinued, and supply is very limited.

¹ Refer to the burndown section of this guide for additional suggestions on managing cool-season weeds. **Water-seeded, no-till systems.** Research has shown that dense vegetation may be killed effectively with herbicides but stand establishment is difficult because of inadequate soil/seed contact due to mats of dead vegetation. Additional research has shown that soil kept free of vegetation all winter will become compacted, and rice seedlings may have difficulty "pegging" and will tend to drift.

² Certain populations of barnyardgrass, ducksalad and pickerelweed have become resistant to some traditional herbicides. If this occurs, use alternative herbicides. Contact your local LSU AgCenter county agent for recommendations. Also, refer to the herbicide resistance section of this guide for suggestions on herbicide resistance management.

³ See "Appendix A" for **GLYPHOSATE PRODUCTS, FORMULATIONS AND SURFACTANT RECOMMENDATIONS.**

SOYBEAN WEED MANAGEMENT

Table I. Effectiveness of selected soybean herbicides four weeks after application.

	itchgrass	seedling johnsongrass	annual grasses	red rice	pigweed	prickly sida	hemp sesbania	morningglory	cocklebur	sicklepod	texasweed	redweed	jointvetch	wild poinsettia	hophornbeam copperleaf	smellmelon
PREEMERGENCE HERBICIDES¹:																
Authority Elite / BroadAxe	1	7	9	-	9	9	8	8	-	8	-	8	8	8	8	8
Authority First / Sonic	-	7	7	-	8	8	8	8	-	8	-	-	-	-	9	8
Authority MTZ	-	5	5	-	9	9	9	9	-	8	-	9	8	-	9	9
Authority XL	-	6	7	-	9	9	9	9	-	9	-	9	8	-	9	9
Boundary	-	8	9	-	9	8	9	9	-	9	-	9	7	-	9	8
Canopy EX	1	4	5	4	9	8	7	9	9	6	8	8	8	9	9	7
Canopy DF	1	6	8	6	9	9	8	8	8	8	7	9	5	8	9	7
Command	8	9	9	7	4	9	1	4	4	1	1	8	2	9	6	-
Dual Magnum	1	7	9	8	9	5	2	1	1	2	3	7	1	3	5	7
Envive / Enlite	-	6	7	7	8	7	7	8	8	8	-	8	8	-	8	8
Fierce	-	7	7	7	9	8	8	9	-	8	-	9	8	-	9	9
FirstRate	1	2	3	1	3	7	3	9	9	6	-	-	-	8	5	5
metribuzin	1	6	8	6	9	9	8	5	6	4	6	9	6	7	9	6
Outlook	1	7	9	8	9	5	2	1	1	2	3	7	1	2	5	7
Prefix	-	7	8	8	9	7	9	9	8	6	-	9	8	9	9	9
Prowl/Prowl H ₂ O	8	9	9	6	9	1	1	3	0	2	0	2	1	1	0	6
Pursuit	1	8	8	7	8	5	3	6	9	5	6	7	1	6	6	-
Sharpen	-	4	4	0	8	6	6	8	-	5	-	-	-	-	8	6
Valor	0	2	6	0	9	8	8	8	-	8	8	8	5	8	8	7
Valor XLT	-	4	6	0	9	9	9	9	-	8	-	9	9	-	9	9
Verdict	-	7	9	-	9	8	8	9	-	8	-	-	-	-	9	9
Zidua	-	8	9	9	9	8	8	7	-	8	-	9	8	-	8	8
POSTEMERGENCE HERBICIDES:																
Assure II	9	9	9	9	0	0	0	0	0	0	0	0	0	0	0	0
Basagran	0	0	0	0	4	8	6	4	9	1	2	7	2	5	4	5
Classic	0	0	0	0	9	2	8	8	8	8	2	8	7	8	3	4
Cobra	1	3	3	1	9	8	9	8	8	3	7	8	6	8	8	9
FirstRate	0	3	3	0	6	8	7	9	9	4	-	8	-	8	7	6
Reflex/Flexstar/Dawn/Rhythm	0	2	4	0	9	3	9	8	8	3	6	5	7	8	9	9
Flexstar GT 3.5	9	9	9	9	9	8	9	9	9	9	9	9	7	9	9	9
Fusilade DX	9	9	9	7	0	0	0	0	0	0	0	0	0	0	0	0
glyphosate ^{2,3}	9	9	9	9	9	8	7	8	9	8	9	8	7	9	9	9
glyphosate ^{2,3} + Classic	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
glyphosate ^{2,3} + Ultra Blazer	9	9	9	9	9	8	9	9	9	9	9	8	7	9	9	9
glyphosate ^{2,3} + ET	9	9	9	9	9	9	9	9	9	9	-	-	-	-	9	9
glyphosate ^{2,3} + Prefix	9	9	9	9	9	8	9	9	9	9	9	9	7	9	9	9

SOYBEAN WEED MANAGEMENT

Table I. Effectiveness of selected soybean herbicides four weeks after application.

	itchgrass	seedling johnsongrass	annual grasses	red rice	pigweed	prickly sida	hemp sesbania	morningglory	cocklebur	sicklepod	texasweed	redweed	jointvetch	wild poinsettia	hophornbeam copperleaf	smellmelon
POSTEMERGENCE HERBICIDES continued:																
glyphosate ^{2,3} + FirstRate	9	9	9	9	9	9	7	9	9	9	9	8	7	9	9	9
glyphosate ^{2,3} + Marvel SC	9	9	9	9	9	8	9	9	-	9	-	-	-	-	9	9
glyphosate ^{2,3} + Reflex/Flexstar	9	9	9	9	9	8	9	9	9	9	9	9	8	9	9	9
glyphosate ^{2,3} + Resource	9	9	9	9	9	8	7	9	9	9	9	8	7	9	9	9
glyphosate ^{2,3} + Warrant	-	7	9	-	9	8	7	7	-	9	9	8	7	9	-	-7
glyphosate ^{2,3} + Zidua	-	9	9	9	9	9	8	8	-	9	9	9	8	9	9	9
Liberty 280SL ⁴	3	7	7	-	7	8	9	9	-	9	-	-	-	-	8	8
Liberty 280SL ⁴ + Classic	3	7	7	-	9	9	9	9	-	9	-	-	-	-	9	8
Liberty 280SL ⁴ + Ultra Blazer	3	7	7	-	9	9	9	9	-	9	-	-	-	-	9	8
Liberty 280SL ⁴ + FirstRate	3	7	7	-	9	9	9	9	-	9	-	-	-	-	9	8
Liberty 280SL ⁴ + Flexstar/Rhythm	3	7	7	-	9	9	9	9	-	9	-	-	-	-	9	8
Liberty 280SL ⁴ + Prefix	3	7	7	-	9	9	9	9	-	9	-	-	-	-	9	8
Liberty 280SL ⁴ + Resource	3	7	7	-	9	8	9	9	-	9	-	-	-	-	9	8
Poast Plus	9	8	9	7	0	0	0	0	0	0	0	0	0	0	0	0
Pursuit	8	8	8	8	9	4	2	7	9	3	7	6	2	6	4	5
Select Max/others	9	9	9	8	0	0	0	0	0	0	0	0	0	0	0	0
Sequence	9	9	9	9	9	8	7	8	9	9	9	8	7	9	9	9
Storm	1	4	3	1	9	8	9	8	9	4	6	8	5	8	9	9
Ultra Blazer	0	2	3	0	8	3	9	8	6	3	5	3	5	8	8	8
DIRECTED POSTEMERGENCE HERBICIDES:																
2,4-DB	0	0	0	0	9	4	6	9	9	4	4	4	6	5	5	6
paraquat	4	5	9	7	9	6	5	6	4	6	3	5	7	9	8	8
Linex, Lorox	2	2	4	2	9	7	9	8	6	5	7	4	9	7	8	8
Linex or metribuzin + 2,4-DB	2	5	6	2	9	8	9	9	9	7	7	4	9	8	9	9
metribuzin	2	5	8	2	8	7	8	7	7	6	7	4	8	7	9	9

¹ Preemergence herbicides must be activated by rainfall or overhead irrigation.

² For use only in Roundup Ready varieties.

³ See Appendix A for various glyphosate products.

⁴ For use only in Liberty Link varieties.

SOYBEAN WEED MANAGEMENT

SOYBEAN

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREPLANT¹:			
S-metolachlor @ 1.0 - 1.9 lb/A	Dual Magnum @ 1.33-1.67 pt/A	Italian ryegrass; fall treatment	Apply to prepared seedbeds between September 1 st and December 1 st . Best control is generally observed from late October to mid-November. Will not control emerged ryegrass. Mix with paraquat to control emerged ryegrass. Incorporation will be beneficial if an activating rainfall is not received soon after application. Don't incorporate deeper than 2-3 inches. The maximum combined fall and spring metolachlor rate is 2.54 lb. ai/A.
chlorimuron @ 0.005 - 0.02 lb/A + thifensulfuron @ 0.006 - 0.015 lb/A + flumioxazin @ 0.02 - 0.06 lb/A	Envive @ 3.5 oz/A or Enlite @ 2.8 oz/A	Many winter annuals	Apply before planting as part of a burndown program. Consult label for pH, O.M. and recrop restrictions.
chlorimuron @ 0.028 lb/A + tribenuron @ 0.008 lb/A	Canopy EX @ 2 oz/A	Many winter annuals	Apply before planting as part of a burndown program. Do not apply within 7 days of planting. Consult label for pH, O.M. and recrop restrictions.
trifluralin @ 0.5 - 1.5 lb/A	Treflan, Trifluralin, Trific, Trilin, Tri-4 – 4 EC @ 1.0-1.5 pt/A on light soil 1.5-2.25 pt/A on medium soil 2.0-3.0 pt/A on heavy soil	Most annual grasses, seedling johnsongrass; fair control of some broadleaf weeds	Apply before planting and incorporate 2-3 inches deep. Trifluralin can be applied at rates higher than listed to control certain annuals and to suppress rhizome johnsongrass; consult label.
pendimethalin @ 0.5 - 1.5 lb/A	Prowl 3.3 EC @ 1.2-1.8 pt/A on light soil 1.8-2.4 pt/A on medium soil 2.4-3.6 pt/A on heavy soil Prowl H ₂ O @ 1-2 pt/A on light soil 2 pt/A on medium soil 3 pt/A on heavy soil	Most annual grasses, seedling johnsongrass; fair control of some broadleaf weeds	Before planting, incorporate 2-3 inches deep within 7 days of application if sufficient rainfall has not been received. Highest rates for high organic matter soils. Prowl can be applied at rates higher than listed to control certain annuals and to suppress rhizome johnsongrass; consult label.
flumetsulam @ 0.05 - 0.066 lb/A + pendimethalin OR trifluralin	Python 80 WDG @ 0.8-0.89 oz/A on light soil 0.89-1.0 oz/A on med-heavy soil Rates for pendimethalin or trifluralin are listed above.	Most annual grasses, selected broadleaf weeds; provides good horseweed (mare's-tail) control	Apply before planting and incorporate 1-3 inches deep. Do not apply to soils with pH above 7.8. Do not rotate with cotton for 18 months or grain sorghum for 12 months following application. See label for other restrictions. See comments for pendimethalin or trifluralin.

SOYBEAN WEED MANAGEMENT

SOYBEAN

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREPLANT¹ continued:			
chlorimuron @ 0.04 - 0.07 lb/A +metribuzin @ 0.24 - 0.43 lb/A + pendimethalin OR trifluralin	Canopy 75 DF @ 6 oz/A on light soil 8 oz/A on medium soil 10.7 oz/A on heavy soil Rates for pendimethalin or trifluralin are listed above.	Morningglories, yellow and purple nutsedge, pigweeds, prickly sida, wild poinsettia and other broadleaf weeds	Apply and incorporated up to 30 days before. May also be applied at planting or before emergence. DO NOT apply to emerged crop. Do not apply to land to be rotated to cotton the next year. Soil pH > 7.0 greatly reduces rotational flexibility. Do not use on soils with pH > 7.5. Crop stunting may occur if excessive rainfall occurs after application but before soybean emergence. Consult label.
clomazone @ 0.75 - 1.0 lb/A	Command 3ME @ 2.0-2.67 pt/A on light-med. soil 2.67 pt/A on heavy soil	Most annual grasses, some broadleaf weeds	Apply before planting with (1-3 inches deep within 3 hours) or without incorporation. Do not incorporate for itchgrass control. Consult label for rotational restrictions.
PREEMERGENCE:			
chlorimuron @ 0.04 - 0.07 lb/A +metribuzin @ 0.24 - 0.43 lb/A	Canopy 75 DF @ 6 oz/A on light soil 8 oz/A on medium soil 10.7 oz/A on heavy soil Exact rate is dependent on soil organic matter %; consult label	Annual grasses, broadleaf weeds	Apply at preplant incorporated or surface- applied at planting. Do not use postemergence. Follow labeled rotational crop restrictions. Follow sprayer cleanup instructions before spraying subsequent crops. Do not apply to soils with a pH greater than 7.5. Soils with pH of 7.0 – 7.4, use 4 oz./A of Canopy 75 DF to reduce potential injury. Do not apply to metribuzin sensitive varieties.
dimethenamid-P @ 0.76 - 1.3 lb/A	Outlook 6EC @ 12-14 oz/A on light soil 14-18 oz/A on med-heavy soil	Most annual grasses, red rice, johnsongrass from seed; fair control of some broadleaf weeds	Apply after planting before weeds emerge.
flumioxazin @ 0.063 lb/A	Valor SX @ 2 oz/A	Broadleaves, some suppression of annual grasses	Apply after planting before weeds emerge. Consult label for tank-mixes to improve grass control.
S-metolachlor ² @ 0.96 - 1.91 lb/A	Dual II Magnum, Dual Magnum @ 1.0-1.33 pt/A on light soil 1.33-1.67 pt/A on medium soil 1.33-2.0 pt/A on heavy soil	Most annual grasses, red rice, johnsongrass from seed; fair control of some broadleaf weeds	Apply at preplant incorporated, surface applied or preplant. Apply after planting and before weeds emerge. May be incorporated. Shallow incorporation (1-2 inches) with a spike tooth harrow or rolling cultivator is required to control red rice under low rainfall conditions.
metolachlor ² @ 1.5 - 2.5 lb/A	Parallel 7.8EC, others @ 1.5-2.0 pt/A on light soil 2.0-2.6 pt/A on medium soil	See comments above.	See comments above for S-metolachlor.
chlorimuron @ 0.005 - 0.02 lb/A+ thifensulfuron @ 0.006 - 0.015 lb/A + flumioxazin @ 0.02 - 0.06 lb/A	Envive @ 3.5 oz/A or Enlite @ 2.8 oz/A	Broadleaf and grass weeds	Apply before planting. Consult label for pH, organic matter and recrop restrictions to determine whether to use Envive or Enlite.
S-metolachlor @ 0.98 lb/A + metribuzin @ 0.24 lb/A	Boundary 6.5 EC @ 1.5 pt/A	Most annual grasses, selected broadleaf weeds	Apply before planting. Ensure soybean variety is tolerant of metribuzin prior to use.

SOYBEAN WEED MANAGEMENT

SOYBEAN

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE continued:			
flumetsulam @ 0.05 - 0.066 lb/A + metolachlor @ 1.5 -2.5 lb/A	Python 80 WDG @ 0.8-0.89 oz/A on light soil 0.89-1.0 oz/A on med-heavy soil Dual rates are listed above	Most annual grasses, selected broadleaf weeds	Apply at preplant incorporated or surface applied at planting. Consult label for more information on rates and recrop intervals.
linuron @ 0.50 - 1.0 lb/A	Lorox 50DF @ 0.66-1.25 lb/A on light soil 1.0-1.66 lb/A on medium soil 1.25-2.0 lb/A on heavy soil Linex 4L @ 1.0-2.33 pt/A on light-med soil 1.33-2.66 pt/A on heavy soil	Most small seeded annual grasses, broadleaf weeds	Apply at planting. Exact rate depends on soil organic matter. Consult label. Plant seed at least 3/4 inch deep. Not recommended on soils lighter than sandy loams. Injury may occur on light soils if heavy rainfall occurs soon after application. Do not exceed 2 lb./A in a single application.
metribuzin @ 0.25 - 0.75 lb/A	Sencor/Glory/others 75DF formulation @ 0.30 - 0.67 lb/A on medium soil 0.67-1.0 lb/A on heavy soil	Annual grasses, most broadleaf weeds such as cocklebur, prickly sida, hemp sesbania, wild poinsettia	Apply at planting. Plant seed 1 1/2 inches deep. On light soils, organic matter content should be 2% or higher. Best performance expected on river bottom soils and medium- to heavy-soils in the rice area. High rate for Mississippi Delta clays. Do not apply to sensitive varieties. Sencor is labeled for use on light (sandy) soils to control sicklepod at 0.25-0.38 lb./A active ingredient.
pendimethalin @ 0.5 - 1.5 lb/A	Prowl 3.3 or Pendimax @ 1.2-2.4 pt/A on light soil 1.8-2.4 pt/A on medium soil 2.4-3.6 pt/A on heavy soil Prowl H ₂ O @ 1-2 pt/A on light soil 2 pt/A on medium soil 3 pt/A on heavy soil	Most annual grasses, johnsongrass from seed; fair control of some broadleaf weeds	Apply at planting. Highest rates for high organic matter soils.
S-metolachlor @ 1.09 lb/A + fomesafen @ 0.25 lb/A	Prefix 5.3 EC @ 2.0 pt/A	Annual grasses, broadleaf weeds	Before, during or after crop emergence. Must have rainfall for activation. Excellent choice for pigweed control. Postemergence applications must be applied no later than 90 days before harvest.
sulfentrazone @ 0.1 – 0.2 lb/A + S- metolachlor 0.94 – 1.6 lb/A	Authority Elite OR BroadAxe @ 19-25 oz/A on light soil 25-32 oz/A on medium soil 25-32 oz/A on heavy soil	Annual grasses, annual sedges, broadleaf weeds	Before, during or after planting, but before crop emergence. Consult label for recropping intervals.
sulfentrazone @ 0.14 – 0.2 lb/A + metribuzin @ 0.2 – 0.3 lb/A	Authority MTZ @ 12-14 oz/A on light soil 14-16 oz/A on medium soil 16-18 oz/A on heavy soil	Annual grasses, broadleaf weeds such as morningglory and pigweed	Before, during or after planting but before crop emergence. Soybean cultivars may differ in tolerance to Authority MTZ; check label for specific cultivars.

SOYBEAN WEED MANAGEMENT

SOYBEAN

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE continued:			
sulfentrazone @ 0.19 - 0.37 lb/A + chlorimuron @ 0.025 – 0.05 lb/A	Authority XL @ 5-7 oz/A on light soil 6.5-8 oz/A on medium soil 7-9.6 oz/A on heavy soil	Annual grass, broadleaf weeds	Before, during or after planting, but before crop emergence. Consult label for pH, organic matter and recrop restrictions to determine whether to use Authority XL.
sulfentrazone @ 0.25-0.31 lb/A + cloransulam @ 0.03-0.04 lb/A	Authority First OR Sonic @ 6.45-8 oz/A	Broadleaf weeds with grass suppression	Before, during or after planting but before crop emergence. Consult label for recropping intervals.
pyroxasulfone @ 0.08 – 0.19 lb/A	Zidua @ 1.5-2.1 oz/A on light soil 2-3 oz/A on medium soil 2.5-3.5 oz/A on heavy soil	Annual grass, broadleaf weeds	May be applied preplant or preemergence. Must have rainfall for activation. Do not apply if soybeans have begun to emerge. Do not apply more than one application per cropping season.
pyroxasulfone @ 0.08 – 0.11 lb/A + flumioxazin @ 0.06 – 0.08 lb/A	Fierce @ 3 – 3.75 oz/A	Annual grass, broadleaf weeds	May be applied preplant or preemergence. Must have rainfall for activation. Do not apply if soybeans have begun to emerge. Do not apply if products containing metolachlor or S-metolachlor or Outlook have been applied preemergence in the same cropping season.
saflufenacil @ 0.02-0.04 lb/A + dimethenamid-P @ 0.2-0.39 lb/A	Verdict @ 5-10 oz/A	Annual grass, broadleaf weeds	Preplant interval depends upon rate. Soybean can be planted immediately following 5 oz/A, 14 days after 7.5 oz./A and 30 days after 10 oz./A. Do not apply to emerged soybean because severe injury will occur.
POSTEMERGENCE:			
pyroxasulfone @ 0.053 – 0.189 lb/A	Zidua @ 1.0 – 2.1 on light soil 1.5 – 3.0 on medium soil 2.0 – 3.5 on heavy soil	Annual grass, broadleaf weeds	Apply between V1 and V3 soybean growth stages. Optimum timing is V2-V3. Emerged weeds are not controlled and require addition of a labeled postemergence herbicide.
acetochlor @ 1.125 lb/A	Warrant @ 1.5 qt/A See label for rate ranges according to soil type and organic matter content.	Annual grasses, small-seeded broadleaves	Postemergence surface applied from emergence to R2. Optimum timing of application is V2-V3. Emerged weeds are not controlled and require addition of a labeled postemergence herbicide.
bentazon @ 0.75 - 1.5 lb/A	Basagran 5L @ 1.2 – 2.4 pt/A Apply with COC @ 1 gal/100gal	Cocklebur and prickly sida; fair on other broadleaf weeds	Apply after soybean plants have first trifoliolate leaves. Add 1 pt. of nonionic surfactant per 50 gal. of water when targeting weeds other than cocklebur.
acifluorfen @ 0.25 - 0.5 lb/A	Ultra Blazer 2L @ 0.5-1.5 pt/A Apply with NIS @ 1 qt/100gal or COC @ 1 gal/100gal; see label	Hemp sesbania, most morningglories, smelldelon, Pigweed, other broadleaf weeds	Apply when seedling weeds are in 2- to 4-leaf stage and actively growing. Use 1.0 pt./A for hemp sesbania and showy crotonaria that is actively growing but before flowering. Rate is dependent on weed spectrum and size. Consult label. Maximum rate 0.5 pt./A/application and 2 pt./A/season.

SOYBEAN WEED MANAGEMENT

SOYBEAN

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE continued:			
acifluorfen @ 0.25 - 0.5 lb/A + bentazon @ 0.75 - 1.5 lb/A	Storm @ 1.5 pt/A Apply with NIS @ 1 qt/100gal or COC @ 1 gal/100gal; see label	Hemp sesbania, morningglories, smellmelon, pigweed, prickly sida, cocklebur, other broadleaf weeds	Application same as above. Choose most serious weed pest and use the full rate of whichever herbicide is considered most effective plus 1 pt. of the herbicide. Read and follow label instructions. Storm at 1.5 pt./A is equivalent to 1 pt of each herbicide in a tank-mix.
chlorimuron @ 0.008 - 0.012 lb/A	Classic 25DG @ 0.5-0.75 oz/A Apply with NIS @ 1 qt/100 gal.	Morningglories, pigweed, sicklepod, hemp sesbania	Apply after soybeans have first trifoliolate leaves and when weeds have two to six leaves. See label for recrop intervals. Don't apply to soils with a pH higher than 7.5. May tank-mix with glyphosate in Roundup Ready soybeans.
cloransulam-methyl @ 0.016/A	FirstRate @ 0.30 oz/A Apply with NIS @ 1 qt/100 gal	Horseweed (mare's-tail), cocklebur, and morningglories, specifically palmleaf morningglory	Apply before weeds exceed height limitations (generally 2-4 inches tall) and prior to soybeans reaching 50% flowering stage. Application prior to full emergence of first soybean trifoliolate may cause temporary chlorosis. May tank-mix with other soybean herbicides, including glyphosate in Roundup Ready soybeans. May reduce grass control when mixed with some grass herbicides.
imazethapyr @ 0.06 lb/A	Pursuit DG @ 1.44 oz/A Apply with NIS @ 1 qt/100 gal	Annual grasses and certain broadleaf weeds	Apply before weeds are 3 inches tall. See comments in preemergence section. See label for recrop intervals.
lactofen @ 0.15 - 0.19 lb/A	Cobra 2L @ 10.0-12.5 oz/A. Apply with NIS @ 1 qt/100 gal.	Morningglories, cocklebur, pigweeds, prickly sida, ballonvine, smellmelon, copperleaf	Apply before weeds exceed height limitations. Application may cause moderate burn; however, soybeans normally recover in 10 days without loss of yield.
fomesafen @ 0.25 - 0.35 lb/A	Reflex 2L, Dawn @ 1-1.5 pt/A Flexstar, Rhythm 1.88L @ 1-1.5 pt/A Apply with NIS @ 1 qt/100gal or COC @ 1 gal/100gal; see label	Morningglories, cocklebur, pigweed, hemp sesbania, suppression of grasses	Apply before weeds exceed height limitations. Soybeans are very tolerant to Reflex. May be mixed with grass herbicides. Injury may be observed under hot, humid conditions.
fomesafen @ 0.12-0.18 lb/A + fluthiacet-methyl @ 0.007-0.01 lb/A	Marvel SC @ 5-7.25 oz/A Apply 0.25% v/v NIS; see label	Broadleaf weeds	Apply when weeds are 2 inches. Add glyphosate to improve broadleaf control and to provide grass control. Add 0.25 percent v/v of NIS if applied alone.
fluthiacet @ 0.0035 - 0.006 lb/A	Cadet 91 EC @ 0.5 to 0.9 oz/A Apply 0.25% v/v NIS; see label	Morningglories, pigweeds, hemp sesbania	Apply when weeds are 2 inches. Add glyphosate to improve broadleaf control and to provide grass control. Add 0.25% v/v of NIS if applied alone.

SOYBEAN WEED MANAGEMENT

SOYBEAN

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE continued:			
pyraflufen ethyl @ 0.0008 - 0.0012 lb/A	ET @ 0.5 to 0.75 oz/A Apply 0.25% v/v NIS; see label	Morningglories, pigweeds, hemp sesbania	Apply when weeds are 2-4 inches. Add glyphosate to improve broadleaf control and to provide grass control. Add 0.25% v/v of NIS if applied alone. Expect slight burning of soybean leaves for seven to 10 days after application.
fluazifop-P-butyl @ 0.125 - 0.50 lb/A	Fusilade DX @ 0.37-0.75 pt/A Apply with NIS @ 1 qt/100gal or COC @ 1 gal/100gal; see label	Annual and perennial grasses	Apply before grasses exceed height recommended for treatment. Use the highest rate for bermudagrass with runners 4-6 inches long. Application to larger grasses or grasses under stress may result in reduced control.
clethodim @ 0.09 - 0.25 lb/A	Select Max @ 12-32 oz/A. 2 lb/gal formulation @ 6-16 oz/A Apply with NIS @ 1 qt/100gal or COC @ 1 gal/100gal; see label	Annual and perennial grasses	Application same as above. Refer to label for rate for specific grass species. Addition of a spray-grade nitrogen fertilizer or ammonium sulfate may further improve weed control. See label.
sethoxydim @ 0.19 - 0.47 lb/A	Poast Plus @ 1.5-2.25 pt/A Apply with NIS @ 1 qt/100gal or COC @ 1 gal/100gal; see label	Annual and perennial grasses	Apply before grasses exceed height recommended for treatment. In general use 0.5 pt./A for annual grasses up to 4 inches tall, 1.5 pt/A for johnsongrass 1-2 feet tall and 2.25 pt./A for bermudagrass with 4- to 6-inch runners. Application to larger grasses or grasses under stress may result in reduced control. Activity may be reduced if mixed with other herbicides. Consult labels for retreatment rates.
quizalofop @ 0.10 - 0.20 lb/A	Assure II @ 5-10 oz/A Apply with NIS @ 1 qt/100gal or COC @ 1 gal/100gal; see label	Annual and perennial grasses	Apply before grasses exceed height recommended for treatment. Application to larger grasses or grasses growing under stress may result in reduced control.
glyphosate ³ @ 0.7-1.0 lb/A	Roundup PowerMax @ 22 oz/A Touchdown Total @ 24 oz/A 4 lb/gal formulations @ 32 oz/A	Most broadleaf weeds and grasses	FOR USE IN ROUNDUP READY VARIETIES ONLY. See Herbicide-Tolerant Soybean Varieties on last page of this section for further information.
glyphosate ³ @ 0.7-1.3 lb/A + S-metolachlor ² @ 0.94-1.5 lb/A	Sequence 5.25 L @ 2.5-4.0 pt/A OR Glyphosate (4 lb/gal formulations) @ 23-36 oz/A + Dual Magnum @ 1 -1.6 pt/A	Most broadleaf weeds and grasses	FOR USE IN ROUNDUP READY VARIETIES ONLY. Apply from soybean cracking to 90 days before soybean harvest. See Herbicide-Tolerant Soybean Varieties on last page of this section for further information.
glyphosate ³ @ 1-1.5 lb/A + fomesafen @ 0.25-0.38 lb/A	Flexstar GT 3.5 @ 3.5 - 5.3 pt/A OR Glyphosate (4 lb/gal formulations) @ 1-1.5 qt/A + Reflex @ 1-1.6 pt/A	Most broadleaf weeds and grasses; good option for increased control of morningglory, hemp sesbania, smellmelon	FOR USE IN ROUNDUP READY VARIETIES ONLY. See Herbicide-Tolerant Soybean Varieties on last page of this section for further information.

SOYBEAN WEED MANAGEMENT

SOYBEAN

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE continued:			
chlorimuron @ 0.013-0.02 lb/A + thifensulfuron @ 0.013-0.02 lb/A +glyphosate ³ @ 0.7-1.0 lb/A	Synchrony XP @ 0.75-1.125 oz/A + Roundup PowerMax @ 22 oz/A Touchdown Total @ 24 oz/A 4 lb/gal formulations @ 32 oz/A	Broadleaf and grass weed control	Apply only to STS/RR soybean varieties. Apply after first trifoliolate leaf. See Herbicide-Tolerant Soybean Varieties on last page of this section for further information.
glufosinate @ 0.4 lb/A	Liberty 280SL @ 22 oz/A	Most broadleaf weeds; good control of small grasses and pigweed if not taller than 3-inches.	FOR USE IN LIBERTY LINK VARIETIES ONLY. Two to three applications and/or the use of residual herbicides are recommended. Make first application 7-10 days after emergence on 2- to 3-inch weeds. Make the second application 10-14 days later. Make the third application as needed on 2- to 3-inch weeds. Do not exceed 65 oz./A/year. Use residual in burndown or at planting. See Herbicide-Tolerant Soybean Varieties on last page of this section for further information.
glufosinate @ 0.4 lb/A + S-metolachlor @ 0.9 lb/A	Liberty 280SL @ 22 oz/A + Dual Magnum @ 1.0 pt/A	Broadleaf and grass weed herbicide; good option where residual was not used preplant or at planting.	FOR USE IN LIBERTY LINK VARIETIES ONLY. Good option when a residual was not used at burndown or at planting. See comments above for Ignite and Dual II magnum. See Herbicide-Tolerant Soybean Varieties on last page of this section for further information.
DIRECTED POSTEMERGENCE:			
2,4-DB @ 0.2 lb/A	Various formulations @ 1pt/A; consult product labels for correct rate and surfactant requirements,	Annual morningglory, cocklebur, pigweed, prickly sida	Apply after soybeans are 8 inches tall. Apply to lower 3 inches of soybean plants as a directed spray . Repeat once if necessary. Do not apply to soybeans showing root rot symptoms.
paraquat @ 0.07-0.12 lb/A	Paraquat (2 lb/gal formulation) @ 4.5-8 oz/A; paraquat (3 lb/gal formulation) @ 3-5.1 oz/A Surfactant required; consult label	Seedling grasses such as seedling johnsongrass, crabgrasses, signalgrass, barnyardgrass, goosegrass	Apply when grasses and pigweed are 2-4 inches tall and soybeans are at least 8 inches. Directed Spray Only. Good coverage necessary for control. Soybeans treated topically will be killed. Do not exceed 30 lb. pressure. Do not graze treated areas. Apply low rate to weeds 2 inches tall and higher rate to grasses 2-4 inches tall and pigweeds 2-3 inches tall. Consult the label.
linuron @ 0.25 - 1.0 lb/A	Lorox 50DF @ 0.5 - 2.0 lb/A Linex 4L @ 0.5 - 2.0 pt/A Add 0.25% v/v nonionic surfactant	Grasses and small broadleaf weeds	Apply after soybeans are 8 inches and weeds less than 6 inches tall. Directed spray only. Severe injury to soybeans may occur if spray strikes mid- to upper portions of soybean plants. Low rate for smaller weeds, higher rate for larger weeds. Consult the label.
linuron @ 0.25 - 0.5 lb/A + 2,4-DB @ 0.2 lb/A	Linuron and 2,4-DB rates as above Add 0.25% v/v nonionic surfactant	Grasses and small broadleaf weeds	Apply after soybeans are 8 inches tall and weeds less than 6 inches tall. Directed spray only. Severe injury to soybeans may occur if spray strikes mid- to upper portions of soybean plants. Low rate for smaller weeds, higher rate for larger weeds. Consult the label.

SOYBEAN WEED MANAGEMENT

SOYBEAN

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
DIRECTED POSTEMERGENCE continued:			
metribuzin @ 0.25 - 0.50 lb/A	Sencor/Glory @ 0.33 - 0.67 lb/A Add 0.25% v/v nonionic surfactant or 1% v/v crop oil concentrate	Grasses, broadleaf weeds such as cocklebur, dayflower, prickly sida, hemp sesbania and others	Apply After soybeans are 8 inches tall and before grasses are 1 inch tall and broadleaf weeds are 3 inches tall. Directed Spray Only. Spray only the lower quarter to third of soybean plants. Do not apply to sensitive varieties. Higher rate required to control sesbania and prickly sida and to suppress morningglory, spotted spurge and wild poinsettia. Consult the label.
metribuzin @ 0.25 - 0.50 lb/A + 2,4-DB @ 0.2 lb/A	Rates as above Add 0.25% v/v nonionic surfactant or 1% v/v crop oil concentrate	Grasses and small broadleaf weeds	Apply after soybeans are 8 inches tall. Directed Spray Only. Severe injury to soybeans may occur if spray strikes mid- to upper portions of soybean plants. Low rate for smaller weeds, higher rate for larger weeds.
PREHARVEST DESSICANTS:			
carfentrazone @ 0.023 lb/A	Aim 2EC @ 1.5 oz/A Add 1% v/v crop oil concentrate	Better on morningglories than pigweed, sicklepod, etc.	Apply after crop has matured and grain has begun to dry down. More effective on annual vines. Do not apply within 3 days of harvest. Apply in 10 gal. by ground, 5 gal. by air.
saflufenacil @ 0.022-0.045 lb/A	Sharpen @ 1 - 2 oz/A Add 1% MSO + 8.5 lb/100 gal AMS	Morningglories and other broadleaf weeds	Apply once soybean has reached physiological maturity (all pods and seeds have no green color). Indeterminate varieties: 65% brown pods, more than 70% leaf drop, 30% or less seed moisture. Determinate varieties: more than 50% leaf drop and remaining leaves are yellowing. Preharvest interval is 3 days.
paraquat @ 0.126 - 0.25 lb/A	paraquat (2 lb/gal formulation) @ 8 - 16 oz/A; paraquat (3 lb/gal formulation) @ 5.4-10.7 oz/A Add 0.25% v/v nonionic surfactant	Desiccation of weeds and soybeans only	Indeterminate varieties: 65% of pods are mature or moisture content is 30% or less. Determinate varieties: 50% leaf drop and remaining leaves are yellow. Some drought stressed weeds will not be desiccated. Do not graze or harvest for hay. Apply in 20 gal. by ground or 5 gal. by air. Preharvest interval is 15 days. Immature soybeans will be injured.
sodium chlorate @ 6 lb/A	6 lb/gal formulation @ 1 gal/A 5 lb/gal formulation @ 1.2 gal/A 3 lb/gal formulation @ 2 gal/A	Desiccation only. Level of weed control is affected by environmental conditions.	Apply 7-10 days before harvest. Apply in 20 gal. by ground, 5 gal. by air. Check label for environmental conditions most favorable for desiccation. Apply under high temperatures and humidity.

¹ Refer to the burndown section of this guide for suggestions on managing cool-season weeds.

² When metolachlor is manufactured, it contains a 1:1 ratio of two metolachlor isomers; the -R and the -S isomer. The -S isomer has greater herbicidal activity than the -R isomer. Alternatively, according to the Syngenta Crop Protection labels, if the trade names include the word "Magnum," the -S isomer is an active ingredient. If the trade name does not include "Magnum", the metolachlor -R:-S isomer ratio is 1:1.

³ See "Appendix A" for glyphosate products and their surfactant requirements.

SOYBEAN WEED MANAGEMENT

HERBICIDE-TOLERANT SOYBEAN VARIETIES

Roundup Ready Soybeans. These varieties are tolerant to overtop applications of glyphosate herbicide. The initial application of glyphosate should be made at 0.7 to 1 lb/A when weeds are less than 4 inches tall. If the first application is made to weeds 5-12 inches tall, increase the glyphosate rate to 1.5 quarts/acre. Numerous formulations of glyphosate are available for use and are shown in Appendix A; therefore, rates may differ depending upon glyphosate formulation used. Additionally, ensure that the formulation is labeled for use in Roundup Ready soybean. Do not apply past first bloom. Consult the product label for use requirements. Remember that the longer the weeds remain in the field, the larger they become and longer they compete with the soybean. Since some morningglories, hemp sesbania, yellow and purple nutsedge and dayflower are not controlled with one application, two applications of glyphosate often are needed. Sequential treatments may be needed, depending upon weed pressure, growing conditions and other factors. If applying glyphosate by air, be extremely careful to prevent off-site target movement.

Classic + glyphosate tank mix. Classic (active ingredient chlorimuron) at 0.25 to 0.33 oz product/acre + glyphosate may be tank-mixed for improved postemergence and perhaps some preemergence weed control in Roundup Ready soybean. A non-ionic surfactant at 0.25 percent v/v may be needed if glyphosate formulation does not contain a preloaded surfactant. Check the glyphosate to determine if additional surfactant is needed. Apply this tank-mix at the proper weed height and after the first soybean trifoliolate leaf has expanded. Classic and all herbicides that contain chlorimuron have the tendency to persist in the soil if soil pH is higher than 7.0. If soil pH is higher than 7.5, do not apply Classic or chlorimuron containing herbicides.

Other glyphosate tank-mixes. Glyphosate also may be tank-mixed with Ultra Blazer, First Rate, Reflex, etc. for increased broadleaf weed control in Roundup Ready soybean. The best choice depends upon the weed spectrum present. Be certain to scout fields and choose an appropriate herbicide based on weed spectrum. Ultra Blazer is a good choice if hemp sesbania is present, but is somewhat weak on jointvetch. First Rate is a good choice if prickly sida and/or palmleaf morningglory is present. See Table 2 in soybean weed control section for additional information.

Sulfonylurea tolerant soybean (STS). These varieties are tolerant to herbicides such as Classic, Canopy or Synchrony STS (members of the sulfonylurea herbicide family). These varieties allow utilization of the sulfonylurea herbicides in high pH soils in the current crop year and in following crops. Soybean varieties are available that are tolerant to both glyphosate and sulfonylurea herbicides (STS/RR varieties).

Liberty Link soybean. These varieties are tolerant to overtop applications of Liberty 280 (glufosinate). The initial application of Liberty 280 should be made at 22 oz product/A, 7-10 days after soybean emergence. A sequential application of Liberty 280 should follow 10-14 days later or to 2- to 4-inch weeds. A maximum of 65 oz product/A/year can be applied. Do not apply past first bloom. Liberty 280 should provide good control of most broadleaf weeds but is weak on grass weeds. For acceptable grass weed control, Liberty 280 should be applied to grasses less than 3 inches tall. The Liberty Link soybean weed control system works very well with a residual herbicide that provides grass control. Metolachlor or S-metolachlor containing products may be tank-mixed with Liberty 280 to provide residual control of some small-seeded broadleaf and grass weeds. Liberty 280SL may also be tank-mixed with Classic, Flexstar, FirstRate, Ultra Blazer, etc. for increased broadleaf weed control in Liberty Link soybean. If Liberty Link soybean are planted in an area with known large grassy weed populations, a graminicide such Select Max, Fusilade, etc. should be budgeted to control late-season grass problems.

SMALL GRAINS WEED MANAGEMENT

Table 1. Effectiveness of selected small grain herbicides 4 weeks after application.¹

	annual bluegrass	annual ryegrass	canarygrass	little barley	wild garlic	wild onion	henbit	curly dock	swinecress	vetch	buttercup	Shepherd's-purse	bittercress	cutleaf eveningprimrose	chickweed
PREPLANT:															
Finesse	9	7	-	3	5	5	9	8	9	3	9	9	9	9	9
Sharpen	1	1	-	-	-	-	8	8	8	8	8	8	8	8	8
PREEMERGENCE:															
Finesse	9	7	-	3	5	5	9	8	9	3	9	9	9	9	9
POSTEMERGENCE:															
Anthem Flex	8	8	-	-	-	-	8	-	8	5	7	7	-	-	8
Zidua	8	8	-	-	-	-	8	-	8	5	7	7	-	-	8
2,4 – D	0	0	0	0	6	8	7	9	8	9	9	9	9	9	8
dicamba plus 2,4-D	0	0	0	0	8	9	8	9	9	9	9	9	9	9	9
Harmony Extra	0	0	0	0	9	7	8	9	8	8	9	9	9	8	9
Hoelon	0	9 ³	8	5	0	0	0	0	0	0	0	0	0	0	0
metribuzin	9	7 ⁴	6	7	0	0	9	7	8	3	9	9	9	8	9
Osprey	9	9 ⁵	8	5	5	5	9	7	8	3	9	9	6	6	7
Axial	0	9	9	0	0	0	0	0	0	0	0	0	0	0	0
Powerflex HL	8 ⁶	9 ⁵	9	3	5	5	9	9	9	9 ⁷	9	9	9	9	9
Prowl H ₂ O ²	9	7	8	3	0	0	9	3	-	0	-	-	-	3	-
Finesse	9	7 ⁵	-	0	6	6	9	8	8	3	8	9	9	8	9

¹ Not all small-grain herbicides are listed. Not all the herbicides or their use pattern is labeled or safe on all small grains. Following is a summary of which crop/use pattern labeled on small grains grown in Louisiana: **Wheat** all herbicides listed are labeled. **Barely** do not use Osprey or Powerflex at anytime or Finesse preplant or preemergence. **Oats** only 2, 4-D and Harmony Extra are labeled. **Rye** only 2, 4-D is labeled.

²Prowl H₂O will not control emerged weeds. Apply after wheat emerges but before weeds emerge. Use as a residual component with postemergence herbicides.

³Will not control ACCase resistant ryegrass.

⁴This rating is based on fall applications made to wheat with 2-3 leaves before ryegrass emerges. Later applications are not effective.

⁵Will not control ALS resistant ryegrass.

⁶Not listed on the label, but fall applications have controlled small bluegrass in Louisiana. Spring applications do not consistently control bluegrass.

⁷Expect regrowth 4-6 weeks after application; follow up applications of 2,4-D or Harmony are usually required.

SMALL GRAINS WEED MANAGEMENT

Table 2. Control strategies for selected weeds.¹

Weed Problem	Suggested Management Strategies
General weed control	The best weed control and wheat yields are observed when weeds are managed in the fall. Fields should be treated with glyphosate or paraquat prior to or at planting to ensure wheat emerges before weeds.
Ryegrass	Two applications are usually required to manage ryegrass. The first application should be applied in the fall, and the second application should be applied in the winter (January or February). Metribuzin, Finesse, Osprey, Powerflex, Anthem Flex are good choices for managing ryegrass in the fall. Metribuzin must be applied at the 2- to 3-leaf wheat stage before ryegrass emerges. To control ryegrass, Finesse should be applied preplant or preemergence before wheat and ryegrass emerge. When using Finesse, fields must be fallowed or planted to STS soybeans. Powerflex and Osprey should be applied postemergence when ryegrass reaches the 2- to 3-leaf stage. Finesse, Powerflex and Osprey will not control ALS resistant ryegrass. Anthem Flex and Zidua have to be applied as a delay-PRE following 80% wheat emergence. Hoelon and Axial XL are the best choices for managing ryegrass in January or February. Hoelon will not control ACCase-resistant ryegrass or ryegrass that has tillered. Axial has been the most consistent herbicide for managing ryegrass in February.
vetch	Two applications are often required to manage severe infestations. Powerflex and Harmony Extra can be used in the fall for control. In most situations, Powerflex in the fall followed by Harmony Extra in January or February is the best control strategy. 2,4-D can also be used after wheat has finished tillering and before jointing.
little barley	Start clean, and apply metribuzin as soon as wheat reaches the 2- to 3-leaf stage. A second application may be required after wheat begins to tiller. Osprey, Powerflex and Axial may provide some suppression but will not control little barley.

¹See next section for more information regarding specific herbicides. Labels and recommendations may change. Always consult the label before using suggested herbicides.

SMALL GRAINS WEED MANAGEMENT

SMALL GRAINS (Wheat, Barley, Oats, Rye)¹

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREPLANT:			
chlorsulfuron @ 0.016 lb/A + metsulfuron @ 0.003 lb/A	Finesse @ 0.4 oz/A	Most common broadleaf weeds and annual bluegrass. Suppresses ryegrass.	Wheat only: Apply before planting. Drill wheat at least 1 inch deep or injury may occur. Do not use if wheat will be broadcast-seeded. Can be mixed with glyphosate to control emerged weeds. Extremely long rotation interval for most crops grown in Louisiana. STS soybeans can be grown 6 months after application; all other crops can be grown 18 months after application. Do not use an organophosphate insecticide within 60 days of application. Can be applied in a liquid nitrogen solution. No grazing restrictions.
saflufenacil @ 0.02-0.04 lb/A	Sharpen @ 1-2 oz/A Apply with MSO @ 1 gal/100 gal + AMS @ 8.5-17 lb/100 gal	Small, actively growing broadleaf weeds and preemergence activity on broadleaf weeds	Wheat, Barley, Oats: Rainfall required for this herbicide as a preemergence treatment. Use only with drill-planting method. Consult label for recropping restrictions and grazing restrictions.
PREEMERGENCE:			
chlorsulfuron @ 0.0195 lb/A + metsulfuron @ 0.004 lb/A	Finesse @ 0.5 oz/A	Most common broadleaf weeds and annual bluegrass. Suppresses ryegrass.	Wheat only: See comments on preplant section.
POSTEMERGENCE:			
pyroxasulfone @ 0.06-0.131 lb/A + carfentrazone @ 0.004-0.009 lb/A	Anthem Flex @ 2-2.7 oz/A on light soil 2.75-3.5 oz/A on medium soil 3.5-4.5 oz/A on heavy soil	Annual bluegrass, ryegrass, other small-seeded broadleaf weeds	Do not apply until 80% of the wheat has germinated and the shoot is at least 1/2 inch tall. Do not apply seed wheat deeper than 1.5 inches, but seed at least 1 inch deep. Excessive rainfall or poor environmental conditions after application can lead to injury. Do not apply to broadcast seeded wheat.
pyroxasulfone @ 0.053-0.12 lb/A	Zidua @ 1-2 oz/A	Annual bluegrass, ryegrass, other small-seeded broadleaf weeds	Do not apply until 80% of the wheat has germinated and the shoot is at least 1/2 inch tall. Do not apply seed wheat deeper than 1.5 inches, but seed at least 1 inch deep. Excessive rainfall after application or poor environmental conditions can lead to injury. Do not apply to broadcast seeded wheat.

SMALL GRAINS WEED MANAGEMENT

SMALL GRAINS (Wheat, Barley, Oats, Rye)¹

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE continued:			
2,4-D amine @ 0.5 - 1.0 lb/A 2,4-D ester @ 0.5 - 1.0 lb/A 2,4-D acid @ 0.2 - 0.7 lb/A	Various @ 1.0 - 2 pt/A* Various @ 1.0 - 2 pt/A* Barrage @ 6 -13 oz/A Unison @ 1.0 - 3.25 pt/A * Based on 4 lb/gal product. See product labels for correct rate.	Dock, plantain, mustard and other broadleaf weeds, plus winter peas and vetch Wild onion or wild garlic. Use highest labeled rate. Control will not be complete, but aerial bulblet formation will be reduced. Less effective on wild garlic than on wild onion.	Application timing and grazing restrictions may vary; always refer to the label. Most labels allow applications after the onset of tillering. Applications are safest after 2-3 tillers have formed. Do not apply at panicle initiation, panicle differentiation, boot or heading stages. Panicle initiation and differentiation occur around the time the first internode is 0.5 inches long. Choose sunny days for making the application. LVE formulation is more compatible with nitrogen solutions. Do not graze or feed forage from treated fields within 2 weeks after treatment. Do not exceed these rates, or severe injury may occur. If used on oats or rye, make application only after tillering is complete and before jointing.
dicamba @ 0.125 lb/A + 2,4-D amine @ 1 lb/A	Clarity/Banvel @ 4 oz/A + 2,4-D amine @ 2.0 pt/A	Most broadleaf weeds, winter peas, vetch. More effective on wild onion and wild garlic than 2,4-D alone	Wheat, Barley: Do not use unless potential injury is acceptable. Application timing same as for 2,4-D, except that this combination may not be used after jointing.
thifensulfuron @ 0.009- 0.018 lb/A + tribenuron @ 0.0045 - 0.009 lb/A oz/A	Harmony Extra SG @ 0.45-0.9 oz/A Apply with NIS @ 1-2 pt/100 gal	Wild garlic and many broadleaf weeds. Use 0.75 to 0.9 oz/A for wild garlic. Does not control wild onion.	Wheat, Barley, Oats: Apply after the 2-leaf stage but before the flag leaf emerges. Do not use with nitrogen.
diclofop @ 0.80-1.5 lb/A	Hoelon @ 2.0-3.33 pt/A	Annual ryegrass. Does not control annual bluegrass.	Wheat, Barley: Apply 2.0-2.66 pts/A to ryegrass from emergence until the 2-leaf stage. Use 2.66 to 3.33 pt/A from the 3 leaf stage to tillering. Do not mix with other herbicides.
metribuzin @ 0.094-0.14 lb/A	Sencor/Glory/others @ 2-3 oz/A	Annual bluegrass, henbit, chickweed	Wheat, Barley: Apply between the 2-leaf and 2-tiller crop stage before weeds emerge. Injury may occur when applications are made to waterlogged soils. Some varieties may be sensitive to metribuzin. Do not use if wheat has been broadcast-seeded.
mesosulfuron-methyl 0.013 lb/A	Osprey @ 4.75 oz/A Apply with MSO @ 1.5 pt/A	Annual bluegrass, limited broadleaf weed control Good control of non-ALS resistant ryegrass.	Wheat only: Apply when ryegrass is in the 1-leaf to 2-tiller stage. Can be applied from wheat emergence to jointing. Best results are obtained if applications are made before ryegrass tillers. Some transient leaf burn may occur if applied with nitrogen fertilizers. Can be tank-mixed with some broadleaf herbicides, insecticides and fungicides; consult label. See label for rotation intervals.

SMALL GRAINS WEED MANAGEMENT

SMALL GRAINS (Wheat, Barley, Oats, Rye)¹

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE continued:			
pinoxaden @ 0.054	Axial XL @ 16.4 oz/A	Ryegrass – Will not kill Hoelon resistant ryegrass. Does not control annual bluegrass.	Wheat and Barley: Apply between the 2-leaf and pre-boot stage. For optimum control, apply prior to the 3-tiller stage of ryegrass. Can be tank-mixed with some broadleaf herbicides, insecticides and fungicides. Consult label for approved pesticides. Do not graze within 30 days of application or harvest within 60 days of application. Straw can be fed to livestock 60 days after application. Rotation restrictions: 0 days – wheat and Barley; 30 days – leafy and root crops; 120 days – all other crops.
pyroxsulam @ 0.002 lb ai/A	Powerflex HL @ 2 oz/A Apply with NIS @ 0.25 to 0.5 % v/v plus 1 to 2 qt/A UAN or 1.5 to 3 lb/A AMS; COC @ 1 to 1.25 % v/v; or MSO @ 1% v/v.	Most common broadleaf weeds, including vetch. Good annual bluegrass control when applied in the fall. Excellent control of non-ALS resistant ryegrass.	Wheat only. Apply anytime between the 3-leaf stage and jointing. Best results obtained when applied in the fall to actively growing weeds. COC or MSO may be required with spring applications, large weeds or under poor growing conditions. COC and MSO increase the risk of injury. Do not apply liquid fertilizer within 7 days of an application. Do not graze within 7 days or cut hay within 28 days of an application. Do not apply organophosphate insecticides within 5 days of an application. Cotton, soybean, grain sorghum and sunflowers can be planted 3 months after application. Corn can be planted 9 months after application. The rotation interval for rice and sweet potatoes is 12 months.

SMALL GRAINS WEED MANAGEMENT

SMALL GRAINS (Wheat, Barley, Oats and Rye)¹

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
Postemergence continued:			
pendimethalin @ 0.7 to 1.4 lbs ai/A	Prowl H ₂ O: Coarse soil -1 to 2 pts/A Medium soil – 1.5 to 3 pts/A Fine soil- 2 to 3 pts/A In most situations use 1.5, 2.1, or 2.6 pts/A coarse, medium or heavy soil, respectively.	Residual/preemergence control of many broadleaf weeds and annual grasses. Suppresses ryegrass.	Wheat only. Apply after wheat reaches the 1-leaf stage until flag leaf emergence. Wheat should be planted 0.5- to 1-inch deep. Must be applied before weeds emerge. May be applied with any herbicide labeled for wheat. Applications before wheat emerges may result in severe stand reductions. Do not harvest hay or forage within 28 or 11 days of application, respectively. Do not apply within 60 days of harvest.
chlorsulfuron @ 0.016 lb ai/A + metsulfuron @ 0.003 lb ai/A	Finesse @ 0.4 oz/A Apply with NIS @ 1-2 pt/A	Most common broadleaf weeds and annual bluegrass. Suppresses ryegrass.	Wheat, Barley: Apply anytime between the 1-leaf and boot stage. Do not apply in any boot or heading stage. Extremely long rotation interval for most crops grown in Louisiana. STS soybeans can be grown 6 months after application; all other crops can be grown 18 months after application. Do not use an organophosphate insecticide within 60 days of application. Can be applied in a liquid nitrogen solution. No grazing restrictions.

¹ Not all small grain herbicides are listed. Not all the herbicides or their use pattern is labeled or safe on all small grains. Following is a summary of which crop/use pattern labeled on small grains grown in Louisiana. **Wheat:** all herbicides listed are labeled. **Barley:** do not use Osprey or Powerflex at anytime or Finesse preplant or preemergence. **Oats:** only 2, 4-D and Harmony Extra are labeled. **Rye:** only 2, 4-D is labeled.

SUGARCANE WEED MANAGEMENT

The Sugarcane Weed Management Guide is prepared by Dr. Al Orgeron, Area Pest Management Specialist, LSU AgCenter, Hammond, La. The sections in the guide are in chronological order based on the sugarcane growing season from planting through harvest. Also included are sections on fallow and ditch-bank weed control. For additional information concerning herbicides listed in this weed guide, consult the herbicide label. Expected weed control with sugarcane herbicides is provided in Table 1. A listing of various herbicides by common name and trade name is included in Table 2. Provided in Table 3 is a listing of glyphosate products with surfactant recommendations. Information related to weed management programs for crops grown in Louisiana can be found at http://www.lsuagcenter.com/en/communications/publications/management_guides/Louisianas+Suggested+Chemical+Weed+Control+Guide.htm.

Rates for herbicides are expressed on a **broadcast** basis. To calculate **band rate**, for liquid and dry formulations, use this formula:

$$\frac{\text{Band width in inches}}{\text{Row width in inches}} \times \text{Broadcast RATE per acre} = \text{Band RATE per acre}$$

AT-PLANTING WEED CONTROL (AUGUST/SEPTEMBER)

Herbicides may be applied on a band to the top of the row or broadcast. A broadcast application will help reduce weed encroachment from the row middles. Herbicide should be applied immediately after the row has been rolled or packed. When about one-half inch of rainfall is received within 10 days after herbicide application, residual weed control can be expected for about 60 days. A follow-up herbicide application about 60 days after planting can extend the control of summer weeds and also can provide residual control of winter weeds, resulting in cleaner beds in spring. See "At-Planting Preemergence Split Application Programs" and "Postemergence Weed Control (September-November)" sections. Herbicide programs described in this section also can be used in sugarcane harvested for seed and in sugarcane harvested early during grinding.

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled (See Table 1)	Remarks and Precautions
AT-PLANTING PREEMERGENCE (AUGUST/SEPTEMBER):			
atrazine @ 2.0 - 4.0 lb/A	Atrazine /others (See Table 2) 4L @ 2.0 – 4.0 qt/A 90DF @ 2.2 - 4.4 lb/A	Annual summer and winter broadleaf weeds	Use higher rate on heavy soils and when sugarcane is planted prior to early September.
sulfentrazone plus metribuzin @ 0.18 - 0.37 lb/A + 0.27 - 0.56 lb/A	Authority MTZ 45DF @ 16 - 33 oz/A	Morningglory (tie-vine); other broadleaf weeds and nutsedge	Use higher rate on heavy soils and soils with organic matter higher than 2%. At the highest rate of 33 oz/A, the amount of metribuzin in Authority MTZ is not sufficient to provide grass control. A 16 oz rate of Authority MTZ contains 0.36 lb of metribuzin; A 32 oz rate of Authority MTZ contains 0.75 lb of metribuzin.
mesotrione @ 0.19 - 0.24 lb/A	Callisto 4L @ 6 - 7.7 oz/A	Annual summer and winter broadleaf weeds	Use higher rate on heavy soils or when sugarcane is planted prior to early September.
clomazone @ 1.0 - 1.25 lb/A plus diuron @ 2.5 lb/A	Command 3ME @ 2.7 - 3.3 pt/A plus Diuron/Direx /others (See Table 2) 4L at 2.5 qt/A	Seedling johnsongrass, itchgrass, browntop millet; other annual grasses; bermudagrass suppression	Use higher rate on heavy soils and when sugarcane is planted prior to early September. Bleaching can occur when sugarcane has less than 2 inches of soil cover.
clomazone @ 1.0 - 1.25 lb/A plus metribuzin @ 0.75 lb/A	Command 3ME @ 2.7 - 3.3 pt/A plus Metribuzin /others (See Table 2) 75DF @ 1.0 lb/A	Seedling johnsongrass, itchgrass, browntop millet; other annual grasses; bermudagrass suppression	Use higher rate on heavy soils and when sugarcane is planted prior to early September. Bleaching can occur when sugarcane has less than 2 inches of soil cover.

SUGARCANE WEED MANAGEMENT

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled (See Table 1)	Remarks and Precautions
AT-PLANTING PREEMERGENCE (AUGUST/SEPTEMBER):			
diuron @ 2.4 - 3.0 lb/A	Diuron/Direx /others (See Table 2) 4L @ 2.4 – 3.0 qt/A 80DF @ 3.0 - 3.8 lb/A	Broadleaf weeds	Use higher rate on heavy soils and when sugarcane is planted prior to early September.
metribuzin @ 1.5 - 3.0 lb/A	Metribuzin /others (See Table 2) 75DF @ 2.0 - 4.0 lb/A	Seedling johnsongrass; other annual grasses; broadleaf weeds	Safe to sugarcane on all soil types. Use higher rate on heavy soils and when sugarcane is planted prior to early September. Can provide bermudagrass suppression at higher rates. Addition of pendimethalin can improve control of browntop millet and itchgrass.
pendimethalin @ 2.0 - 3.0 lb/A	Prowl/Prowl H₂O /others (See Table 2) 3.3EC @ 2.4 - 3.6 qt/A 3.8CS @ 2.1 - 3.1 qt/A	Seedling johnsongrass, itchgrass, browntop millet; other annual grasses	May be applied to the soil surface or incorporated. Use higher rate on heavy soils. Should be applied with other herbicides for broadleaf weed control. Addition of metribuzin can improve control of bermudagrass.
terbacil @ 0.8 - 1.2 lb/A	Sinbar 80WDG @ 1.0 - 1.5 lb/A (1.0 lb/A on very sandy soils)	Seedling johnsongrass; other grasses and broadleaf weeds; bermudagrass suppression	Use higher rate on heavy soils and when sugarcane is planted prior to early September. Addition of pendimethalin can improve control of browntop millet and itchgrass.
sulfentrazone @ 0.31 - 0.38 lb/A	Spartan 4F @ 10.0 - 12.0 oz/A	Broadleaf weeds; nutsedge	Use higher rate on heavy soils and when sugarcane is planted prior to early September.
sulfentrazone @ 0.31 - 0.38 lb/A plus carfentrazone-ethyl @ 0.035 - 0.041 lb/A	Spartan Charge 3.5 SE @ 12.8 - 15.2 oz/A	Broadleaf weeds; nutsedge	Use higher rate on heavy soils and when sugarcane is planted prior to early September.
trifluralin @ 1.0 - 2.0 lb/A	Treflan/Trifluralin /others (See Table 2) 4L @ 1.0 - 2.0 qt/A	Seedling johnsongrass, itchgrass, browntop millet; other annual grasses; bermudagrass suppression	Roll or pack rows and incorporate herbicide within 24 hours after application. Avoid incorporation at a depth that will damage seed pieces. Other herbicides should be applied to the soil surface for broadleaf weed control.
flumioxazin @ 0.19 - 0.25 lb/A	Valor SX 51WDG @ 6.0 - 8.0 oz/A	Annual broadleaf weeds	Use higher rate on heavy soils or when sugarcane is planted prior to early September. Do not apply after sugarcane emergence.
hexazinone @ 0.5 lb/A plus diuron @ 2.5 lb/A	Velpar 2L @ 1.0 qt/A or Velossa 2.4L @ 1.6 pt/A plus Diuron/Direx /others (See Table 2) 4L at 2.5 qt/A	Seedling johnsongrass, browntop millet; other annual grasses and broadleaf weeds; bermudagrass suppression	Apply before sugarcane emerges. Application to coarse-textured soils that are low in organic matter may result in sugarcane chlorosis (yellowing) and stunting.
hexazinone @ 0.5 lb/A plus metribuzin @ 1.5 lb/A	Velpar 2L at 1.0 qt/A or Velossa 2.4L @ 1.6 pt/A plus Metribuzin /others (See Table 2) 75DF @ 2.0 lb/A	Seedling johnsongrass, browntop millet; other annual grass and broadleaf weeds; bermudagrass suppression	Apply before sugarcane emerges. Application to coarse-textured soils that are low in organic matter may result in sugarcane chlorosis (yellowing) and stunting.

SUGARCANE WEED MANAGEMENT

AT-PLANTING PREEMERGENCE SPLIT APPLICATION PROGRAMS

A split application program with herbicide applied at planting and around 60 days later will provide extended residual control of bermudagrass, johnsongrass and itchgrass. In some cases where split application programs are used, beds in the spring are essentially free of winter weeds. Programs that can be successful in suppressing bermudagrass include:

Command at 3.3 pt/A plus **Diuron/Direx**/others at 2.5 qt/A at planting followed 60 days later by **Metribuzin**/others at 1.5 lb/A.

Command at 3.3 pt/A plus **Metribuzin**/others at 1.0 lb/A at planting followed 60 days later by **Metribuzin**/others at 1.5 lb/A.

Metribuzin/others at 2 to 3 lb/A at planting followed 60 days later by **Metribuzin**/others at 1.5 lb/A.

Velpar at 1 qt/A or **Velossa** at 1.6 pt/A plus **Diuron/Direx**/others at 2.5 qt/A at planting followed 60 days later by **Metribuzin**/others at 1.5 lb/A.

Velpar at 1 qt/A or **Velossa** at 1.6 pt/A plus **Metribuzin**/others at 1.0 lb/A at planting followed 60 days later by **Metribuzin**/others at 1.5 lb/A.

Treflan/Trifluralin/others at 1.5 to 2 qt/A and incorporated at planting followed 60 days later by **Metribuzin**/others at 1.5 lb/A.

Another option for bermudagrass is to apply herbicide at planting on a band and sink the middles prior to the follow-up application. This program will reduce cost up front but will require an additional tillage operation and favorable weather conditions. If tillage cannot be performed, encroachment of bermudagrass from the row middles can result in a severe weed problem the following year.

WEED CONTROL IN SUGARCANE HARVESTED FOR SEED AND IN SUCCESSION PLANTED SUGARCANE

Although shading from the crop canopy will suppress growth of weeds, once sugarcane is harvested for seed, bermudagrass will rapidly initiate new growth. Any of the herbicide programs listed for use at planting also can be used in fields where sugarcane was harvested for seed or where sugarcane was harvested early and delivered to the mill. Herbicides listed for use at planting also may be used when sugarcane is succession planted. Rates may be reduced slightly (25%) due to the later planting date and to minimize the chance of sugarcane injury.

RESIDUAL CONTROL OF WINTER WEEDS (OCTOBER-NOVEMBER)

For residual control of winter grass and broadleaf weeds, apply **Atrazine**/others, **Diuron/Direx**/others, **Velpar** plus **Diuron/Direx**/others, **Metribuzin**/others or **Sinbar** in October-November to early harvested sugarcane, newly planted sugarcane or sugarcane harvested for seed. Herbicide rates specified in the "At-Planting Weed Control (August-September)" section can be reduced by 25% for November applications. Where a follow-up application is being made, selecting a herbicide other than the one previously applied should be considered to reduce risk of crop injury and development of herbicide resistant weeds. If weeds are present, non-ionic surfactant at 1-2 qt/100 gal or crop oil concentrate at 2-4 qt/100 gal should be added to the spray solution.

POSTEMERGENCE WEED CONTROL (SEPTEMBER-NOVEMBER)

Johnsongrass and Itchgrass (September-October): In early planted sugarcane or in sugarcane harvested for seed, johnsongrass may re-infest fields prior to winter. When applied in October to actively growing johnsongrass 12-18 inches tall, **Asulox/Asulam** 3.3L at 3 qt/A or **Envoke** 75WG at 0.2 oz/A plus **Asulox/Asulam** (See Table 2 Glossary of Herbicides) at 2 qt/A plus non-ionic surfactant at 1-2 qt/100 gal of water or crop oil concentrate at 4 qt/100 gal of water has controlled johnsongrass and reduced re-infestation the following spring. **Asulox/Asulam** alone and with **Envoke** also controls large itchgrass (more than 6 inches). For additional information on **Asulox/Asulam** and **Envoke** see the "Postemergence Weed Control - Johnsongrass and Other Grasses (March-April)" section.

Purple and Yellow Nutsedge (September-October): To control purple and yellow nutsedge 4-12 inches in height in early planted sugarcane apply **Permit**/others 75WDG (See Table 2 Glossary of Herbicides) at 1.0 to 1.33 oz/A with non-ionic surfactant at 1-2 qt/100 gal of water or crop oil concentrate at 4 qt/100 gal of water. To control 2- to 6-inch yellow nutsedge or to suppress 2- to 4-inch purple nutsedge, apply **Envoke** 75 WG at 0.2 oz/A with non-ionic surfactant at 1-2 qt/100 gal of water or crop oil concentrate at 4 qt/100 gal of water. The higher rate of **Permit**/others is needed when nutsedge is large and the population is dense. For best results, herbicide application

SUGARCANE WEED MANAGEMENT

should be made before nutsedge is 6 inches tall. If application is delayed until nutsedge forms a dense mat on the soil surface a sizable tuber population will have developed underground and control will be reduced. Activity of both Permit/others and Envoke is slow and four weeks may be needed to maximize control. Sugarcane is very tolerant to over-the-top applications of Permit/others. No more than three applications of Permit/others can be made per year, and no more than 2.33 oz should be applied per acre per year. Envoke can cause some yellowing and white banding on sugarcane leaves as well as slight stunting, but sugarcane growth and emergence in spring has not been affected. Envoke also will provide some residual control of winter weeds. Other herbicides may be applied with Permit/others or Envoke for additional weed control. *For additional information on Permit/others and Envoke see the "Postemergence Weed Control - Purple and Yellow Nutsedge (March-April)" section.*

Yukon, a 67.5% WDG premix of halosulfuron (the active ingredient in Permit/others) and dicamba (the active ingredient in Clarity/Vision), can provide control of both nutsedge and broadleaf weeds. For Yukon, a 4 oz/A rate is equivalent to 0.67 oz/A Permit 75 WDG and 4.5 oz/A Clarity/Vision 4L; a 6 oz/A rate is equivalent to 1 oz/A Permit and 6.6 oz/A Clarity/Vision; and a 8 oz/A rate is equivalent to 1.3 oz/A Permit and 9.0 oz/A Clarity/Vision.

Bermudagrass (September-November): Shielded application of **glyphosate** to row sides and middles after planting or early harvest has provided good-to-excellent control of emerged bermudagrass (See Table 3 **Glyphosate Products**). Apply 2-3 qt/A of the 4 lb ai/gallon formulation or equivalent rate based on active ingredient in 5-20 gal of water per acre as a shielded application. *Information on glyphosate can be found in the "Fallow Weed Control" section.* Severe injury will occur if glyphosate comes in contact with sugarcane foliage.

Broadleaf Weeds (September-November): Apply **Weedmaster/Brash/others** 3.8L at 0.5 to 1 qt/A, **2,4-D** 3.8L at 0.5 to 1.5 qt/A, **Unison** 1.74L at 24 to 64 oz/A or **Clarity/Vision/others** 4L at 0.5 to 1.0 pt/A when air temperature is above 65° F (See Table 2 **Glossary of Herbicides**). *Additional information related to these herbicides is provided in the "After Layby Weed Control (July-Harvest)" section.*

2,4-D Formulations: Acid, amine salt and ester formulations of **2,4-D** are available (See Table 2 **Glossary of Herbicides**). Since only the acid form of 2,4-D is active in controlling weeds, the herbicide concentration on the label is provided in lb of ae (acid equivalent) per gal instead of lb of ai (active ingredient) per gal, as is the case with most other herbicides. Amine salt and ester formulations of 2,4-D range from 3.8 to 5.6 lb ae/gal. These numbers are important in determining the amount of formulated product to apply per acre. The lower the lb ae/gal the more formulated product required. For example, a 32 fluid oz rate (1 qt/A) of a 3.8L formulation would correspond to 21.7 oz for a 5.6L formulation. **Unison** is an acid formulation of 2,4-D and contains 1.74 lb ae/gal. The rate range for Unison is 24 to 64 oz/A and rate, like other formulations, depends on weed spectrum, density and size. Unison is less volatile (susceptible to changing from a liquid to a gas where off-target movement can occur) than other 2,4-D formulations. Caution should be used anytime 2,4-D is applied near sensitive plants regardless of formulation.

POSTEMERGENCE WEED CONTROL WINTER WEED CONTROL (JANUARY-MARCH)

Broadleaf Weeds: Apply **Weedmaster/Brash/others** 3.8L at 0.5 to 1.0 qt/A, **2,4-D** 3.8L at 0.5 to 1.5 qt/A, **Unison** 1.74L at 24 to 64 oz/A, or **Clarity/Vision/others** 4L at 0.5 to 1.0 pt/A after broadleaf weeds have emerged and when air temperature is above 65° F (See Table 2 **Glossary of Herbicides**). The higher rate should be used when broadleaf weeds are large and clover or vetch is present. *Information related to these herbicides and 2,4-D formulations is provided in the "After Layby Weed Control (July-Harvest)" section.*

Atrazine/others, **Diuron/Direx/others**, **Velpar** plus **Diuron/Direx/others**, **Metribuzin/others** or **Valor** (prior to sugarcane emergence) may be added to improve postemergence weed control and to provide soil residual activity.

Grass and Broadleaf Weeds: **Gramoxone SL** 2L at 3 pt/A or **Paraquat/others** 3L (See Table 2 **Glossary of Herbicides**) at 2 pt/A plus nonionic surfactant at 1-2 qt/100 gal or crop oil concentrate at 2-4 qt/100 gal can be applied to sugarcane with no more than 4 leaves to control ryegrass, rescuegrass, timothy grass and winter annual bluegrass as well as some broadleaf weeds. **Atrazine/others**, **Diuron/Direx/others**, **Velpar** plus **Diuron/Direx/others**, **Metribuzin/others** or **Valor** (prior to sugarcane emergence) may be added to improve burndown and provide soil residual activity. **Gramoxone SL/Paraquat/others** also can be applied with **Weedmaster/Brash/others**, **2,4-D** or **Clarity/Vision/others**. Annual bluegrass can be controlled with **Diuron/Direx/others** 4L at 2.5 lb/A, **Velpar** 2L at 0.8 qt/A plus **Diuron/Direx/others** 4L at 1.4 qt/A, **Metribuzin/others** at 1.33 lb/A, or **Sinbar** at 1.25 lb/A plus a non-ionic surfactant or crop oil concentrate. If herbicides with soil residual activity are applied prior to March 1,

SUGARCANE WEED MANAGEMENT

schedule layby cultivation and herbicide application earlier than normal to avoid weed re-infestation. Selection of a herbicide other than the one previously applied should be considered to reduce risk of crop injury and development of herbicide resistant weeds.

SPRING WEED CONTROL (FEBRUARY-MARCH)

Herbicide programs should be implemented in February or March after residue from the previous harvest has been removed. If weeds are present, non-ionic surfactant at 1-2 qt/100 gal or crop oil concentrate at 2- 4 qt/100 gal should be added to the spray solution. In most cases, herbicide is banded on the top of the row following cultivation of the row sides and middles. If winter broadleaf weeds are present, **Weedmaster/Brash**/others 3.8L at 0.5-1.0 qt/A, **2,4-D** 3.8L at 0.5-1.5 qt/A, **Unison** 1.74L at 24 to 64 oz/A or **Clarity/Vision**/others 4L at 0.5 to 1.0 pt/A can be added (See Table 2 Glossary of Herbicides). The higher rate should be used when broadleaf weeds are large and clover or vetch is present.

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE (FEBRUARY/MARCH):			
atrazine @ 2.0 - 4.0 lb/A	Atrazine /others (See Table 2) 4L @ 2 - 4 qt/A 90DF @ 2.2 - 4.4 lb/A	Seedling broadleaf weeds	Use higher rate on heavy soils.
mesotrione @ 0.09lb/A	Callisto 4L @ 3 oz/A	Seedling broadleaf weeds	Addition of atrazine can improve broadleaf weed control.
mesotrione @ 0.08 - 0.09 lb/A plus atrazine @ 0.5 – 0.6 lb/A	Callisto Xtra @ 20 - 24 oz/A	Seedling broadleaf weeds	Use higher rate on heavy soils.
clomazone @ 1.0 - 1.25 lb/A plus diuron @ 2.5 lb/A	Command 3ME @ 2.7 - 3.3 pt/A plus Diuron/Direx /others (See Table 2) 4L at 2.5 qt/A	Seedling johnsongrass, itchgrass, browntop millet; other annual grasses; bermudagrass suppression	Bleaching/whitening of sugarcane can occur if the crop is emerged at application.
clomazone @ 1.0 - 1.25 lb/A plus metribuzin @ 0.75 lb/A	Command 3ME @ 2.7 - 3.3 pt/A plus Metribuzin /others (See Table 2) 75DF @ 1.0 lb/A	Seedling johnsongrass, itchgrass, browntop millet; other annual grasses; bermudagrass suppression	Bleaching/whitening of sugarcane can occur if the crop is emerged at application.
diuron @ 2.4 - 3.0 lb/A	Diuron/Direx /others (See Table 2) 4L @ 2.4 - 3.0 qt/A 80DF @ 3.0 - 3.8 lb/A	Seedling broadleaf weeds	Use higher rate on heavy soils. Application Can be applied over the top of sugarcane until daily maximum temperatures for the week preceding application average 80° F or higher.
metribuzin @ 1.5 - 3.0 lb/A	Metribuzin /others (See Table 2) 75DF @ 2.0 - 4.0 lb/A	Seedling johnsongrass; other annual grass and broadleaf weeds	Safe to sugarcane on all soil types. Use higher rate on heavy soils or when sugarcane is planted prior to early September. Can provide suppression of bermudagrass at higher rates. Addition of pendimethalin can improve control of browntop millet and itchgrass.
pendimethalin @ 2.0 - 3.0 lb/A	Prowl/Prowl H₂O /others (See Table 2) 3.3EC @ 2.4 - 3.6 qt/A 3.8CS @ 2.1 - 3.1 qt/A	Seedling johnsongrass, itchgrass, browntop millet; other annual grasses	May be applied to the soil surface or incorporated. Use higher rate on heavy soils. Should be applied with other herbicides for broadleaf weed control. Addition of metribuzin can improve control of bermudagrass.
trifluralin @ 2.0 lb/A	Treflan/Trifluralin /others	Seedling johnsongrass, itchgrass, browntop millet; other annual grasses	Incorporate within 24 hours after application. Can provide suppression of bermudagrass. Other herbicides

SUGARCANE WEED MANAGEMENT

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE (FEBRUARY/MARCH):			
	(See Table 2) 4L @ 2.0 qt/A		should be applied for broadleaf weed control.
flumioxazin @ 0.13 - 0.25 lb/A	Valor SX 51WG @ 4.0 - 8.0 oz/A	Annual broadleaf weeds	Can provide residual control when applied at 6-8 oz/A. Do not apply after sugarcane emergence.
hexazinone @ 0.5 lb/A plus diuron @ 2.5 lb/A	Velpar 2L @ 1.0 qt/A or Velossa 2.4L @ 1.6 pt/A plus Diuron/Direx /others (See Table 2) 4L at 2.5 qt/A	Seedling johnsongrass, browntop millet; other annual grass; broadleaf weeds; bermudagrass suppression	Apply to sugarcane before active tillering begins. Application to coarse-textured soils that are low in organic matter may result in sugarcane chlorosis (yellowing) and stunting.
hexazinone @ 0.5 lb/A plus metribuzin @ 1.5 lb/A	Velpar 2L at 1.0 qt/A or Velossa 2.4L @ 1.6 pt/A plus Metribuzin /others (See Table 2) 75DF @ 2.0 lb/A	Seedling johnsongrass, browntop millet; other annual grasses; broadleaf weeds; bermudagrass suppression	Apply to sugarcane before active tillering begins. Application to coarse-textured soils that are low in organic matter may result in sugarcane chlorosis (yellowing) and stunting.

POSTEMERGENCE WEED CONTROL (MARCH/APRIL)

Johnsongrass and Other Grasses (March-April): **Asulox/Asulam** can be applied broadcast, banded or as a spot treatment. Non-ionic surfactant at 1-2 qt/100 gal of water or crop oil concentrate at 1 gal/100 gal of water should be added to the spray solution. If the pH of water is above 9.0, addition of a buffer may be beneficial. At application, average air temperature should be at least 60° F. A 20-hour rain-free period following Asulox application may be needed to maximize control.

First Application - Apply 4 qt/A **Asulox/Asulam** 3.3L broadcast (or the correct proportion if applying on a band) in 15-30 gal of water per acre to actively growing johnsongrass 12-18 inches tall and to itchgrass less than 8 inches tall. If applying on a band, outside nozzles should be mounted on drops and band width should be wide enough to ensure thorough wetting of all foliage. Asulox applied at 3-4 qt/A also controls browntop millet, foxtails, goosegrass and barnyardgrass/junglerice when 6-8 inches tall. Vaseygrass that is less than 8 inches tall can be partially controlled with Asulox at 4 qt/A, but activity is very slow.

Second Application - A second application of **Asulox/Asulam** at 3-4 qt/A broadcast (or the correct proportion if applying on a band) can increase johnsongrass control, but may not increase sugarcane yield over that obtained with a single Asulox application in March/April. This may be beneficial in the plant cane or first stubble crop to reduce infestations in subsequent crops. The second application of Asulox should be made to johnsongrass regrowth, usually about 8 weeks after the first application. Sugarcane injury is more likely when Asulox is applied to sugarcane stressed from drought or excessive soil moisture and high temperature, especially after June 1.

Spot Treatment - The most accurate and economical method of spot treating is to use a calibrated sprayer at a constant speed with the operator turning the spray nozzles on and off as needed. If a high-volume "cattle gun"-type nozzle is used for spot treatment, apply a 2% solution of **Asulox/Asulam** (2 gal of herbicide plus 98 gal of water). Spray to wet foliage, but do not drench because sugarcane injury can be worse compared with spot treatment using a calibrated sprayer.

Aerial Application - **Asulox/Asulam** also may be applied by air using the same rates specified above. Spray volume should be a minimum of 5 gal per acre. After calculating the actual sugarcane acreage to be treated, acreage should be increased to account for ditch-banks and headlands also receiving application.

Envoke - **Envoke** 75WG can be applied postemergence over the top to plant or ratoon cane up to 24 inches tall at 0.3 oz/A broadcast (or the correct proportion if applying on a band) or as a directed application at 0.3 to 0.6 oz/A to sugarcane 18 inches tall at layby. Non-ionic surfactant at 1-2 qt/100 gal of water or crop oil concentrate at 4 qt/100 gal of water should be added to the spray solution. **Envoke** applied over the top of sugarcane can cause some yellowing and white banding on leaves present in the whorl at application as well as slight stunting, but recovery is rapid, and no negative effect on sugarcane yield has been observed. Envoke at 0.3 oz/A will suppress but will not control rhizome johnsongrass or large itchgrass. Combinations of **Envoke** with **Asulox/Asulam** provide complementary broadleaf and grass weed control. Envoke at 0.3 oz/A applied with Asulox 3.3 L at 2 qt/A (half rate) plus non-ionic surfactant or crop oil concentrate has improved control of large rhizome johnsongrass (more than 18 inches) when compared with Asulox applied alone at 4 qt/A (full rate). Envoke at 0.2 oz/A applied with Asulox at 2 qt/A controlled large itchgrass (more than 6 inches) better than Asulox

SUGARCANE WEED MANAGEMENT

applied alone at 4 qt/A. For ground application, use a minimum of 10 gal of water per acre (broadcast basis). Higher spray volume of at least 20 gal per acre should be used for heavy weed infestations to ensure adequate spray coverage. **Envoke cannot be applied aerially. For both Asulox/Asulam and Envoke, DO NOT cultivate, fertilize or otherwise disturb the johnsongrass root system 7 days before or after application.**

Purple and Yellow Nutsedge (March/April): Apply **Permit**/others 75WDG at 1.0 to 1.33 oz/A, **Yukon** 67.5 WDG at 6 to 8 oz/A or **Envoke** 75 WG at 0.2 oz/A with non-ionic surfactant at 1-2 qt/100 gal of water or crop oil concentrate at 1 gal/100 gal of water.

Eastern Black Nightshade (March/April): Apply **Clarity/Vision**/others 4L at 1.0 qt/A, **Callisto** 4L at 3 oz/A plus **Atrazine**/others at 2 qt/A, or **Callisto Xtra** at 24 oz/A plus **Atrazine**/others at 1.5 qt/A with nonionic surfactant at 1 to 2 qt/100 gal of water or crop oil concentrate at 1 gal/100 gal of water..

LAYBY WEED CONTROL (MAY-JUNE)

Herbicides at layby are applied broadcast and directed underneath the sugarcane canopy usually following the last cultivation. It is necessary that the lower canopy be contacted by the spray to assure weed control both in the sugarcane drill and in the row middles. If weeds are present, non-ionic surfactant at 1-2 qt/100 gal or crop oil concentrate at 2-4 qt/100 gal should be added to the spray solution for herbicides with postemergence activity. *Information related to postemergence activity of herbicides can be found in the "After Layby Weed Control (July-Harvest)" section.*

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE LAYBY (MAY-JUNE):			
atrazine @ 2.0 - 4.0 lb/A	Atrazine /others (See Table 2) 4L @ 2 - 4 qt/A 90DF @ 2.2 - 4.4 lb/A	Morningglory (tie-vine); other broadleaf weeds	Use higher rate on heavy soils and where morningglory (tie-vine) is a problem weed. Residual red morningglory control can be expected for around 35 days. Residual control of tie-vine can be extended by applying atrazine a few weeks after the layby cultivation.
sulfentrazone plus metribuzin @ 0.18 - 0.37 lb/A + 0.27 - 0.56 lb/A	Authority MTZ 45DF @ 16 - 33 oz/A	Morningglory (tie-vine); other broadleaf weeds; nutsedge	Use higher rate on clay soils and/or soils with organic matter content higher than 2%. At the highest rate of 33 oz/A the amount of metribuzin in Authority MTZ is not sufficient to provide grass control. See information below for Spartan 4F concerning red morningglory control. Injury will occur if herbicide contacts newly emerging sugarcane shoots and leaves. Do not apply more than 33 oz/A in one growing season and within 120 days of harvest.
mesotrione @ 0.09 lb/A	Callisto 4L @ 3 oz/A	Morningglory (tie-vine); other broadleaf weeds	Addition of atrazine can improve broadleaf weed control, as well as provide postemergence control of eastern black nightshade. Should be applied with other herbicides for grass control.
mesotrione @ 0.08 - 0.09 lb/A plus atrazine @ 0.5 - 0.6 lb/A	Callisto Xtra @ 20 - 24 oz/A	Morningglory (tie-vine); other broadleaf weeds	Use higher rate on heavy soils. Should be applied with other herbicides for grass control. Addition of atrazine can improve postemergence control of eastern black nightshade.

SUGARCANE WEED MANAGEMENT

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE LAYBY (MAY-JUNE):			
diuron @ 2.4 - 3.0 lb/A	Diuron/Direx /others (See Table 2) 4 lb/gallon formulation @ 2.4 - 3 qt/A 80 DF formulation @ 3.0 - 3.8 lb/A	Seedling broadleaf weeds	Apply when sugarcane is 30 inches or taller. Injury will occur if herbicide contacts newly emerging sugarcane shoots and leaves.
metribuzin @ 1.5 - 3.0 lb/A	Metribuzin /others (See Table 2) 75DF @ 2.0 - 4.0 lb/A	Seedling johnsongrass; other annual grass; broadleaf weeds	Addition of pendimethalin can improve control of browntop millet and itchgrass. Residual control of red morningglory can be expected for 35 days.
pendimethalin @ 2.0 - 3.0 lb/A	Prowl/Prowl H₂O /others (See Table 2) 3.3EC formulation @ 2.4 - 3.6 qt/A 3.8CS @ 2.1 - 3.1 qt/A	Seedling johnsongrass, itchgrass, browntop millet; other annual grasses	May be applied to soil surface or soil incorporated. Use higher rate if surface applied or if itchgrass is a problem. For additional weed control, such as morningglory, atrazine and diuron, metribuzin or Spartan may be applied with pendimethalin. See precautions for diuron and Spartan.
sulfentrazone @ 0.19 - 0.25 lb/A	Spartan 4F @ 6.0 - 8.0 oz/A	Broadleaf weeds; nutsedge	Use higher rate on heavy soils and where morningglory (tie-vine) is a problem weed. Residual red morningglory control around 90% can be expected for 50 days and control around 80% can be expected at 70 days. Injury will occur if herbicide contacts newly emerging sugarcane shoots and leaves. Do not apply within 120 days of harvest. Can be applied more than once during the growing season but total usage per 12-month period cannot exceed 12 oz/A.
sulfentrazone @ 0.31 - 0.38 lb/A plus carfentrazone-ethyl @ 0.035 - 0.041 lb/A	Spartan Charge 3.5 SE @ 12.8 - 15.2 oz/A	Broadleaf weeds; nutsedge	Use higher rate on heavy soils and where morningglory (tie-vine) is a problem weed. Residual red morningglory control around 90% can be expected for 50 days and control around 80% can be expected at 70 days. Injury will occur if herbicide contacts newly emerging sugarcane shoots and leaves. Do not apply within 120 days of harvest. Can be applied more than once during the growing season but total usage per 12-month period cannot exceed 15.2 oz/A.
trifluralin @ 1.5 - 2.0 lb/A	Treflan/Trifluralin /others (See Table 2) 4L @ 1.5 - 2 qt/A	Seedling johnsongrass, itchgrass, browntop millet; other annual grasses	Incorporate within 24 hours after application. Other herbicides should be applied to the soil surface for broadleaf weed control.
flumioxazin @ 0.10 - 0.25 lb/A	Valor SX 51WDG @ 3.0 - 8.0 oz/A	Broadleaf weeds	Apply when sugarcane is at least 24 inches high and has begun to joint. Spray contact with more than the lower 6 inches of sugarcane plants will result in severe injury. Residual red morningglory control can be expected for around 35 days. Valor can be applied at a maximum rate of 12 oz/A per crop year. Do not apply within 90 days of harvest.

SUGARCANE WEED MANAGEMENT

AFTER LAYBY WEED CONTROL (JULY-HARVEST)

Morningglory or tie-vines can cause significant problems at sugarcane harvest. To control morningglory and other broadleaf weeds, herbicides can be applied over the crop canopy by air or ground sprayer, or herbicides can be directed underneath the crop canopy. Coverage of the entire morningglory plant with spray solution will provide the most consistent control. Non-ionic surfactant at 1-2 qt/100 gal or crop oil concentrate at 2-4 qt/100 gal should be added to the spray solution.

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE AFTER LAYBY (JULY-HARVEST):			
2,4-D @ 0.47 - 1.42 lb/A	2,4-D 3.8L @ 1.0 - 1.5 qt/A (See Table 2) <i>See information below on 2,4-D formulations</i>	Morningglory (tie-vine); other broadleaf weeds	Apply higher rate if vines are climbing sugarcane plants. Surfactant may be added. Note: Use of 2,4-D is restricted in some parishes. Check local restrictions before application. To avoid potential stand and yield loss in the subsequent plant cane crop, do not apply to seed cane sources later than 7 weeks prior to harvest and planting. See information below on 2,4-D formulations.
atrazine @ 2.0 - 4.0 lb/A	Atrazine/others (See Table 2) 4L @ 2 - 4 qt/A 90DF @ 2.2 - 4.4 lb/A	Morningglory (tie-vine); other broadleaf weeds	Apply with surfactant over the top or directed before row closure occurs. Use higher rate if vines are climbing sugarcane plants.
sulfentrazone plus metribuzin @ 0.18 - 0.37 lb/A + 0.27 - 0.56 lb/A	Authority MTZ 45DF @ 16 - 33 oz/A	Morningglory (tie-vine); other broadleaf weeds and nutsedge	Apply with surfactant as a directed treatment. Injury will occur if herbicide contacts newly emerging sugarcane shoots and leaves. Do not apply more than 33 oz/A in one growing season and within 120 days of harvest.
mesotrione @ 0.09 lb/A	Callisto 4L @ 3 oz/A	Morningglory (tie-vine); other annual broadleaf weeds	Can be applied over the top or as a directed spray. Only one application can be made if Callisto was applied preemergence earlier in the season. Do not harvest sugarcane within 114 days following an over-the-top application and within 100 days following a directed spray. Addition of atrazine can improve postemergence control of eastern black nightshade.
mesotrione @ 0.08 - 0.09 lb/A plus atrazine @ 0.5 - 0.6 lb/A	Callisto Xtra @ 20 - 24 oz/A	Morningglory (tie-vine); other broadleaf weeds	Can be applied over the top or as a directed spray. Only one application can be made if Callisto was applied preemergence earlier in the season. Do not harvest sugarcane within 114 days following an over-the-top application and within 100 days following a directed spray. Addition of atrazine can improve postemergence control of eastern black nightshade.

SUGARCANE WEED MANAGEMENT

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE AFTER LAYBY (JULY-HARVEST):			
dicamba @ 0.5 - 0.75 lb/A	Clarity/Vision/others (See Table 2) 4L @ 16 - 24 oz/A	Morningglory (tie-vine); other broadleaf weeds	Apply higher rate if vines are climbing sugarcane plants. Surfactant may be added. Can be used in areas where 2,4-D use is restricted. To avoid potential stand and yield loss in the subsequent plant cane crop, do not apply to seed cane sources later than 7 weeks prior to harvest and planting.
trifloxysulfuron-sodium @ 0.014 - 0.028 lb/A	Envoke 75WG @ 0.3 - 0.6 oz/A	Morningglory (tie-vine); other broadleaf weeds; itchgrass; other annual grasses; purple and yellow nutsedge	Apply as a directed treatment with non-ionic surfactant at 1 qt per 100 gallons. Do not apply within 100 days of harvest. A maximum of 3 applications or 1.5 oz/A may be applied per growing season.
paraquat @ 0.50 - 1.0 lb/A	Gramoxone SL/Paraquat/others (See Table 2) 2L @ 2.0 - 4.0 pt/A 3L @ 1.3 - 2.7 pt/A	Small grass; broadleaf weeds; bermudagrass suppression	Apply with surfactant as a directed treatment to the row middles in late June to desiccate bermudagrass. Herbicide contact to young sugarcane tillers and leaves can cause significant injury.
halosulfuron @ 0.03 - 0.06 lb/A	Permit/others (See Table 2) 75WDG @ 0.67 - 1.33 oz/A	Purple and yellow nutsedge	Apply as a directed treatment at 1-1.33 oz/A with surfactant to nutsedge growing under the crop canopy.
sulfentrazone @ 0.19 - 0.25 lb/A	Spartan 4F @ 6.0 - 8.0 oz/A	Morningglory (tie-vine); other broadleaf weeds; nutsedge	Apply with surfactant as a directed treatment at the higher rate if morningglory is climbing sugarcane plants. Injury will occur if herbicide contacts newly emerging sugarcane shoots and leaves. If applied in the spring or at layby do not reapply. Do not apply within 120 days of harvest.
sulfentrazone @ 0.31 - 0.38 lb/A plus carfentrazone-ethyl @ 0.035 - 0.041 lb/A	Spartan Charge 3.5 SE @ 12.8 - 15.2 oz/A	Broadleaf weeds; nutsedge	Apply with surfactant as a directed treatment at the higher rate if morningglory is climbing sugarcane plants. Injury will occur if herbicide contacts newly emerging sugarcane shoots and leaves. If applied in the spring or at layby do not reapply. Do not apply within 120 days of harvest. Can be applied more than once during the growing season but total usage per 12-month period cannot exceed 15.2 oz/A.
flumioxazin @ 0.10 - 0.25 lb/A	Valor SX 51WDG @ 3.0 - 8.0 oz/A	Morningglory (tie-vine); other broadleaf weeds; some annual grasses	Apply as a directed treatment after sugarcane has begun to joint. Spray contact with more than the lower 6 inches of sugarcane plants will result in severe injury. Residual red morningglory control can be expected for around 35 days. Valor can be applied at a maximum rate of 12 oz/A per crop year. Do not apply within 90 days of harvest.

SUGARCANE WEED MANAGEMENT

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE AFTER LAYBY (JULY-HARVEST):			
2,4-D plus dicamba @ 0.36 - 0.72 lb/A + 0.12 - 0.24 lb/A	Weedmaster/Brash /others (See Table 2) 3.8L @ 0.5 - 1.0 qt/A	Morningglory (tie-vine); other annual broadleaf weeds	Apply higher rate if vines are climbing sugarcane plants. Surfactant may be added. <u>Note:</u> Use of 2,4-D is restricted in some parishes. Check local restrictions before application. To avoid potential stand and yield loss in the subsequent plant cane crop, do not apply to seed cane sources later than 7 weeks prior to harvest and planting.
halosulfuron plus dicamba @ 0.03-0.06 lb/A + 0.14 - 0.28 lb/A	Yukon 67.5WDG @ 4 to 8 oz/A	Purple and yellow nutsedge, small morningglory (tie vines); other broadleaf weeds	Apply as a directed treatment at 1-1.33 oz/A with surfactant to nutsedge growing under the crop canopy. An 8 oz/A rate is equivalent to 1.3 oz/A Permit and 9.0 oz/A Clarity/Vision.

2,4-D Formulations: Acid, amine salt and ester formulations of **2,4-D** are available (See Table 2 Glossary of Herbicides). Because only the acid form of 2,4-D is active in controlling weeds, the herbicide concentration on the label is provided in lb of ae (acid equivalent) per gal instead of lb of ai (active ingredient) per gal, as is the case with most other herbicides. Amine salt and ester formulations of 2,4-D range from 3.8-5.6 lb ae/gal. These numbers are important in determining the amount of formulated product to apply per acre. The lower the lb ae/gal the more formulated product required. For example, a 32 fluid oz rate (1 qt/A) of a 3.8L formulation would correspond to 21.7 oz for a 5.6L formulation. **Unison** is an acid formulation of 2,4-D and contains 1.74 lb ae/gal. The rate range for Unison is 24-64 oz/A and rate, like other formulations, depends on weed spectrum, density and size. Unison is less volatile (susceptible to changing from a liquid to a gas where off-target movement can occur) than other 2,4-D formulations. Caution should be used anytime 2,4-D is applied near sensitive plants regardless of formulation.

FALLOW WEED CONTROL

Weed control programs during the fallow period can include use of tillage (deep plowing/disking) and herbicides. Frequent and timely cultivation, where weeds are destroyed and prevented from reestablishing can be an effective management tool especially in dry years. Tillage, especially tillage just prior to planting, can reduce soil moisture in the seedbed, which in dry years can hinder plant cane emergence and growth. Apply preemergence herbicides to a weed-free and clod-free bed. Packing of the row top prior to application may improve weed control.

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE FALLOW:			
atrazine @ 2 lb/A	Atrazine /others (See Table 2) 4L @ 2 qt/A 90DF @ 2.2 lb/A	Broadleaf weeds	Apply to weed free beds. Do not apply more than 10 qt/A or 11.1 lb/A per crop year.
EPTC @ 3.0 - 6.1 lbs/A	Eptam 7-E @ 3.5 - 7 pt/A	Annual grasses; broadleaf weeds	Must be thoroughly incorporated 2-4 inches deep immediately following application. For bermudagrass and johnsongrass suppression, plants should be turned under and chopped thoroughly prior to treatment. Must be applied 45 days prior to planting sugarcane.

SUGARCANE WEED MANAGEMENT

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE FALLOW:			
halosulfuron @ 0.03- 0.06 lb/A	Permit /others (See Table 2) 75WDG @ 0.67 - 1.33 oz/A	Purple and yellow nutsedge	A rate of 1-1.33 oz/A with surfactant is recommended for control of nutsedge. Can be applied with other herbicides. Do not exceed 2.7 oz/A in one growing season.
pendimethalin @ 2.5 lb/A	Prowl/Prowl H₂O /others (See Table 2) 3.3EC @ 3 qt/A 3.8CS @ 2.6 qt/A	Seedling johnsongrass, itchgrass, browntop millet; other annual grasses	Apply to clean seedbed or incorporate 4 inches deep at least 60 days prior to planting.

POSTEMERGENCE FALLOW:

Glyphosate and Glyphosate Mixtures: Postemergence herbicides should be applied to actively growing weeds. Several formulations of **glyphosate** are available with the most common being 4L and 5.5L formulations (See Table 3 *Glyphosate Products*). A 32 oz/A rate (1 qt/A) of a 4L formulation would correspond to 26 oz/A of a 5L formulation and 23 oz/A of a 5.5L formulation. Most formulations of glyphosate contain some surfactant. The need for additional surfactant is based on how much surfactant is present in the formulation and the quality of the surfactant. The herbicide label may state that no additional surfactant is needed or recommended, that surfactant may be added, or that surfactant is required and the amount is specified. See Table 3 for information concerning need for surfactant with the various glyphosate products. Always consult the label for specific information on the need for surfactants and other adjuvants.

Johnsongrass in Fallow: For control of johnsongrass and other weeds, rates of 1-2 qt/A of the 4L glyphosate formulation is sufficient (See Table 3 *Glyphosate Products*). Do not cultivate for 7 days after application to allow adequate time for the glyphosate to be taken into the plant and moved to underground rhizomes. Under heavy weed infestation, 2-3 weeks between glyphosate application and planting will allow time for johnsongrass to desiccate and will promote more efficient opening of rows and covering of planted sugarcane. When applying 2,4-D in combination with glyphosate for additional broadleaf weed control, use the high end of the glyphosate rate to avoid a possible reduction in grass control (antagonism).

Broadleaf Weeds in Fallow: **Atrazine**/others 4L at 1-2 qt/A, **Aim** 2EC at 1-2 oz/A, **Valor** 51WDG at 3-4 oz/A, and **Classic** 25DG at 0.5-2.0 oz/A can be applied to control broadleaf weeds and in particular morningglory (tie-vine). The higher rates should be applied to control large vining weeds. Atrazine/others and Aim can be applied any time during the fallow period. Valor can be applied from 2 weeks prior to planting to before sugarcane emerges. Classic can be applied up to 60 days prior to planting. Some residual weed control can be expected with **Atrazine**/others, **Valor** or **Classic**; however, **Aim** has no soil residual activity. Non-ionic surfactant at 1-2 qt/100 gal or crop oil concentrate at 2-4 qt/100 gal should be added to the spray solution. If applied with glyphosate, surfactant present in the glyphosate formulation may be adequate. See Table 3 for information concerning need for surfactant with the various glyphosate products. Always consult the label for specific information on the need for surfactants and other adjuvants.

Bermudagrass in Fallow: In fields where bermudagrass population is high, tillage in combination with glyphosate is most effective. Apply 2-3 qt/A of the 4L glyphosate formulation for control of bermudagrass with less than 8 inch runners. See Table 3 for information concerning need for surfactant with the various glyphosate products. Always consult the label for specific information on the need for surfactants and other adjuvants. Retreatment with 2-3 qt/A may be necessary to maintain control. Do not cultivate for 7 days after application to allow adequate time for the glyphosate to be taken into the plant and moved to underground rhizomes. Under heavy weed infestation, 2-3 weeks between glyphosate application and planting will allow time for bermudagrass to desiccate and will promote more efficient opening of rows and covering of planted sugarcane.

Multiple applications of glyphosate are more effective in controlling bermudagrass than a single application.

Purple and Yellow Nutsedge in Fallow: **Permit**/others 75 WDG at 1.0-1.33 oz/A, **Yukon** 67.5 WDG at 6-8 oz/A and **Envoke** 75WG at 0.15-0.2 oz/A applied with nonionic surfactant at 1-2 qt/100 gal of water or crop oil concentrate at 4 qt/100 gal of water will provide some control of nutsedge. The higher rate is needed when nutsedge is large and the population is dense. For best results, herbicide application should be made before nutsedge is 6 inches tall. If application is delayed until nutsedge forms a dense

SUGARCANE WEED MANAGEMENT

mat on the soil surface a sizable tuber population will have developed underground and control will be reduced. **Classic 25DG** at 0.5-2.0 oz/A will provide some control of yellow nutsedge; however, application is limited up to 60 days prior to planting. **Permit/others, Yukon, Envoke and Classic** can be applied with glyphosate products without negatively affecting grass control. If applied with glyphosate, surfactant present in the glyphosate formulation may be adequate. See Table 3 for information concerning need for surfactant with the various glyphosate products. Always consult the label for specific information on the need for surfactants and other adjuvants. If two applications of glyphosate are planned, **Permit/others, Yukon, Envoke** or **Classic** should be applied with glyphosate in the first application. The follow-up application of glyphosate alone should be effective on nutsedge regrowth. **Yukon**, a premix of halosulfuron (the active ingredient in Permit) and dicamba (the active ingredient in Clarity/Vision/others) and Envoke will also provide some control of broadleaf weeds. For **Yukon**, a 6 oz/A rate is equivalent to 1.0 oz/A **Permit 75WDG** and 6.6 oz/A **Clarity/Vision 4L**, and an 8 oz/A rate is equivalent to 1.3 oz/A **Permit** and 9.0 oz/A **Clarity/Vision**. As also noted for glyphosate, do not cultivate for 7 days after application of **Permit/others, Yukon** or **Envoke** to allow adequate time for movement of herbicide to underground nutsedge tubers.

In situations where nutsedge and other weeds may interfere with row opening at planting, **Gramoxone SL 2L** at 3 pt/A or **Paraquat/others 3L** at 2 pt/A plus non-ionic surfactant at 1-2 qt/100 gal or crop oil concentrate at 2- 4 qt/100 gal can be applied 1-2 weeks before planting to desiccate weeds. Because the herbicides do not move to underground nutsedge tubers, rapid reestablishment should be expected. Consider applying Authority MTZ or Spartan at planting or using **Permit/others, Yukon** or **Envoke** in September or October. See “At-Planting Weed Control (August-September)” and “Postemergence Weed Control (September-November)” sections.

Doveweed in Fallow: Doveweed is a summer annual weed that emerges from mid-June through September. Doveweed as well as many other members of the dayflower family are poorly controlled with glyphosate. In fallow programs where glyphosate is the only herbicide used for weed control, doveweed can form a dense mat across the row and can interfere with row opening at planting. In fields with a known history of doveweed, **glyphosate** should be applied with **Metribuzin/others 75DF** at 1.3 lb/A or **Valor SX 51WDG** at 6-8 oz/A in June to control weeds on formed beds. Metribuzin/others 75DF should provide preemergence control of doveweed up to 60 days after application. For emerged doveweed, effective control may be obtained with **Gramoxone SL 2L** at 3 pt/A or **Paraquat/others 3L** at 2 pt/A, **Atrazine/others 4L** at 2 qt/A or **Metribuzin/others** at 1.5 lb/A applied 1-3 weeks before planting. Non-ionic surfactant at 1-2 qt/100 gal or crop oil concentrate at 2-4 qt/100 gal should be added to the spray solution for postemergence applications. Application of **Gramoxone SL 2L** at 2 pt/A or **Paraquat/others 3L** at 1.33 pt/A with **Atrazine/others** at 2 qt/A or application of **Metribuzin/others 75DF** at 1 lb/A with **Weedmaster/Brash/others 3.8L** at 1.5 pt/A were effective when planting was delayed beyond 3 weeks after application.

No-Tillage Fallow Program: In a no-tillage program, sugarcane stubble must be destroyed with herbicide. To obtain around 90% control of sugarcane stubble, glyphosate 4L should be applied at 1.0 qt/A (6 inch stubble), 1.5 qt/A (10 inch stubble), 2.0 qt/A (16-inch stubble) and 2.5 qt/A (18-inch stubble) (See Table 3 *Glyphosate Products*). Typically in a no-tillage program, a second glyphosate application will be needed to control weeds and any sugarcane regrowth that might occur. It is important that the first glyphosate application be made by the end of April to allow for sugarcane to completely decompose before rows are worked at planting. In fields where bermudagrass population is high, a no-tillage program where glyphosate is used for weed control may not be as effective as glyphosate in combination with tillage.

Note: Glyphosate herbicides can be applied by air, but extreme caution should be used due to problems with off-target movement and damage to sugarcane and other crops in areas adjacent to treated fields.

SUGARCANE WEED MANAGEMENT

DITCH-BANK WEED CONTROL

Problem weeds such as johnsongrass, itchgrass, bermudagrass, poppingweed (*Equisetum*/horsetail) and *Rubus* species (briars) should be controlled on ditch-banks. This will aid in field drainage and prevent weed movement into adjacent sugarcane fields. These recommendations are for non-irrigation, drainage ditch use only. **DO NOT** apply herbicides to a ditch when water is present unless specifically allowed based on the herbicide label. Herbicides should be applied in a minimum of 20 gal of water per acre spray volume.

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
DITCH-BANK WEED CONTROL:			
2,4-D plus triclopyr @ 2.0 + 1.0 lb/A	Crossbow 3L @ 4.0 qt/A	Poppingweed, briars, woody species	Best control obtained when applied to young poppingweed, less than 2 years old. For control of briars and smaller diameter woody species, apply at 1.0-1.5 gal/100 gal of water and add non-ionic surfactant at 1 qt/100 gal of water. Apply in a spray volume of 40-60 gal per acre to thoroughly soak all stems and plant crowns at the soil line. This product contains 2,4-D, and use may be restricted in some areas of the state.
diuron @ 2.0 - 15.0 lb/A	Diuron/Direx /others (See Table 2) 4L @ 2.0 - 15.0 qt/A 80DF @ 2.5 - 18.8 lb/A	Annual grasses, broadleaf weeds	Provides residual control of many annual weeds. Addition of non-ionic surfactant at 1-2 qt/100 gal of water or crop oil concentrate at 2-4 qt/100 gal of water will increase contact activity on small, emerged weeds no more than 3 inches tall. Herbicide activity will be improved if soil in the ditch is moist at application. Do not allow herbicide to contact roots of desirable plants when applied at the higher rates.
triclopyr @ 2.0 - 3.0 lb/A	Garlon /others (See Table 2) 4L @ 2.0 - 3.0 qt/A or 3L @ 2.7 - 4.0 qt/A	Poppingweed, briars, woody species	Control is greater when applied to young poppingweed, less than 2 years old. For control of briars and smaller diameter woody species, apply at 1.5 pt/A of 4L formulation or 2 pt/A of 3A formulation plus non-ionic surfactant at 1-2 qt/100 gal of water. Apply in a spray volume of 40-60 gal per acre to thoroughly soak all stems and plant crowns at the soil line. <u>Note:</u> Garlon 4 at 1 gal. per 80 gal. water plus 1% Roundup has been effective on poppingweed when plants were thoroughly wetted.

SUGARCANE WEED MANAGEMENT

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
DITCH-BANK WEED CONTROL:			
triclopyr plus glyphosate	Garlon /others (See Table 2) Roundup /others (See Table 3) See Remarks and Precautions for rates and mixing instructions	Poppingweed and other ditch-bank weeds	For a 100 gal. total spray mix, include 5 qt of Garlon 4, Triquad 4L or other triclopyr product with a 4L concentration and 4 qt of a Roundup/glyphosate product with a 5.5L concentration or 5.5 quarts of a 4L glyphosate product. If the glyphosate formulation does not contain surfactant, add non-ionic surfactant at 2 quarts per 100 gallons of water. Because herbicide rates are <u>not</u> specified in product per acre, spray volume (gallons per acre) will affect herbicide rate per unit area treated, number of acres of ditch-bank treated and cost per acre. In general, spray volume should be in the range of 20-40 gallons per acre. A standard multi-nozzle spray boom positioned over the ditch, a hand gun (cattle gun sprayer) or a single stationary nozzle sprayer can be used for application. It is important that poppingweed foliage be well-covered. Herbicide should not be applied to a ditch when water is present unless specifically allowed based on the herbicide label. Note: Treating only the bottom of the ditch and not the sides will allow for water movement and will also help to reduce ditch-bank erosion.
pendimethalin @ 2.5 - 3.3 lb/A	Prowl/Prowl H₂O /others (See Table 2) 3.3EC @ 3.0 - 4.0 qt/A 3.8CS @ 2.6 - 3.5 qt/A	Seedling johnsongrass, itchgrass, other annual grasses	Apply in a minimum of 20 gal per acre spray volume prior to weed emergence; will NOT control emerged weeds. May apply with postemergence herbicides to provide residual activity.
glyphosate @ 1.0 - 5.0 lb/A	Roundup /others (See Table 3) 4L @ 1.0 to 5.0 qt/A 5L @ 0.8 to 4.0 qt/A 5.5L @ 0.7 to 3.6 qt/A	Johnsongrass, itchgrass, other weeds	Johnsongrass, itchgrass and most other weeds are controlled at 1-2 qt/A of the 4L glyphosate formulation. Apply 2-3 qt/A for control of bermudagrass with less than 8-inch runners. Retreatment with 2-3 qt/A may be necessary to maintain bermudagrass control. Application with diuron at 5.0 lb ai/A (see information on diuron) or Velpar 2L at 1.0 qt/A or Velossa 2.4L at 1.6 pt/A and Diuron/Direx/others 4L at 2.5 qt/A can increase initial control and provide extended control of many annual weeds. Do not allow herbicide to contact foliage of desirable plants.

SUGARCANE WEED MANAGEMENT

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
DITCH-BANK WEED CONTROL:			
hexazinone @ 0.5 lb/A plus diuron @ 2.5 lb/A	Velpar 2L @ 1.0 qt/A or Velossa 2.4L @ 1.6 pt/A plus Diuron/Direx /others (See Table 2) 4L at 2.5 qt/A	Most ditch-bank weeds including some control of poppingweed	Will not control rhizome johnsongrass or curly dock. Do not use on out-flow ditches or ditches not directly between two cane fields. Very slow activity on poppingweed. Inclusion of 2 qt/A of a 4L glyphosate formulation or 2.67 qt/A of a 6L MSMA formulation has increased rhizome johnsongrass and curly dock control. Apply in a spray volume of at least 40 gal per acre to thoroughly cover the soil and foliage and soak all stems and plant crowns at the soil line. Non-ionic surfactant at 1 qt/100 gal of water or crop oil concentrate at 1 gal/100 gal of water should be added.
2,4-D plus dicamba @ 0.36 - 2.15 lb/A + 0.12 - 0.75 lb/A	Weedmaster/Brash /others (See Table 2) 3.8L @ 0.5 - 3.0 qt/A	Broadleaf weeds	Use 1 qt/A to control annual broadleaf weeds and 1-3 qt/A for suppression of perennial weeds. This product contains 2,4-D and use may be restricted in some areas of the state.

SUGARCANE WEED MANAGEMENT**TABLE 1. EFFECTIVENESS OF SELECTED SUGARCANE HERBICIDES APPLIED PREEMERGENCE AND POSTEMERGENCE IN-CROP AND IN-FALLOW.**

Weed control estimates represent 28-35 days after application of preemergence herbicides and 14-21 days after application of postemergence herbicides at the high end of the rate range. A value of 0 = no control and 10 = 100% control.

	Seedling johnsongrass	Rhizome johnsongrass	Itchgrass (raoulgrass)	Bermudagrass ¹	Browntop millet	Annual grasses	Morningglory (tie-vines)	Other broadleaf weeds	Nutsedges	Doveweed	Winter grasses ²	Winter broadleaf weeds ³
PREEMERGENCE APPLICATION:												
Atrazine/others	2	0	2	0	4	5	8	9	2	5	8	9
Authority MTZ	5	0	2	1	5	5	9	8	7	-	5	8
Callisto	2	0	0	0	5	5	5 ⁶	8	2	8	3	7
Command	8	2	8	6	8	8	3	3	2	-	7	2
Command plus Diuron/Direx/ others or Metribuzin/others	9	2	8	8	9	9	6	8	2	-	7	8
Diuron/Direx/others	7	0	5	1	6	6	6	8	2	3	7	8
Eptam ⁴	8	6	-	6	-	-	7	6	5	-	2	2
Prowl/others	8	2	8	2	8	9	2	2	3	0	6	2
Prowl plus Velpar/Velossa + Diuron/Direx/others	8	2	8	5	9	9	7	8	3	9	7	8
Prowl plus Metribuzin/others	9	2	8	5	9	9	8	9	4	9	8	8
Metribuzin/others	9	0	2	6	6	9	8	9	5	9	8	8
Sinbar	9	0	2	8	3	9	7	7	5	-	6	5
Spartan	4	0	2	0	3	4	9	8	7	-	4	8
Spartan Charge	4	0	2	0	3	4	9	8	7	-	4	8
Treflan/Trifluralin/others ⁴	9	6	9	7	9	9	2	2	5	-	8	2
Valor	3	0	2	0	3	4	8	9	2	-	8	9
Velpar/Velossa + Diuron/Direx/ others or Metribuzin/others	8	2	7	7	8	9	7	8	5	9	8	8

SUGARCANE WEED MANAGEMENT

	Seedling johnsongrass	Rhizome johnsongrass	Itchgrass (raoulgrass)	Bermudagrass ¹	Browntop millet	Annual grasses	Morningglory (tie-vines)	Other broadleaf weeds	Nutsedges	Doveweed	Winter grasses ²	Winter broadleaf weeds ³
POSTEMERGENCE APPLICATION:												
Aim	0	0	0	0	0	0	9	8	0	0	-	-
Asulox/Asulam ⁵	8	7	7	2	8	9	0	0	0	-	-	-
Atrazine/others	2	0	2	0	2	6	9	9	2	7	4	7
Callisto	0	0	1	0	4	4	6 ^{6,7}	8	2	-	-	8
Callisto + Atrazine/others	2	0	2	0	6	7	9	8	2	7	4	7
Clarity/Vision/others	0	0	0	0	0	0	9	9	3	6	0	9
Diuron/Direx/others	6	2	5	0	5	8	7	8	2	-	6	6
Envoke ⁵	7	4	8	1	7	9	6	8	7	2	-	-
Envoke + Asulox/Asulam ⁵	8	7	9	2	8	9	6	8	7	2	7	7
Glyphosate herbicides	9	9	9	8	9	9	6	7	6	4	8	8
Gramoxone SL/ Paraquat/others	8	2	8	4	8	9	8	8	2	8 ⁶	8	8
Permit/others	1	0	0	0	0	1	4	4	8	0	0	0
Spartan	2	0	2	0	2	4	9	8	7	-	3	8
Spartan Charge	2	0	2	0	2	4	9	8	7	-	3	8
Valor	2	0	2	0	3	4	9	8	2	5 ⁶	2	8
Weedmaster/Brash/others	0	0	0	0	0	0	9	9	3	6	0	9
Yukon	0	0	0	0	0	0	8	8	8	6	0	8
2,4-D/others	0	0	0	0	0	0	9	9	3	6	0	9

¹ Expected control level with application at planting prior to weed emergence and following a good fallow program or when applied in late winter prior to weed emergence from the winter dormant period.

² Winter grasses include ryegrass, rescuegrass and timothy grass.

³ Winter broadleaf weeds include sowthistle, wild geranium and clovers.

⁴ Herbicide must be incorporated.

⁵ Requires 28-35 days to reach maximum control.

⁶ Addition of atrazine improves control.

⁷ For best results, apply before morningglory exceed 5 inches tall.

SUGARCANE WEED MANAGEMENT**TABLE 2. GLOSSARY OF HERBICIDES REGISTERED FOR USE IN SUGARCANE IN LOUISIANA.¹**

Common name	Trade name	Manufacturer or distributor	Group no. based on mechanism of action	EPA registration no.
2,4-D	SAVAGE DRY SOLUBLE	Loveland Products, Inc.	Group 4	34704-606
2,4-D	UNISON NOVEL BROADLEAF	Helena Chemical Company	Group 4	5905-542
2,4-D, 2-ethylhexyl ester	LO-VOL 4 SOLVENTLESS	TENKOZ, Inc.	Group 4	71368-14-55467
2,4-D, 2-ethylhexyl ester	WEEDONE LV4 SOLVENTLESS	Nufarm Agricultural Products	Group 4	71368-14
2,4-D, diethanolamine salt + 2,4-D, dimethylamine salt	HI-DEP	PBI Gordon Corporation	Group 4; Group 4	2217-703
2,4-D, dimethylamine salt	2,4-D AMINE 4 (AGRI STAR)	Albaugh, Inc./Agri Star	Group 4	42750-19
2,4-D, dimethylamine salt	2,4-D AMINE-4	Winfield Solutions LLC	Group 4	1381-103
2,4-D, dimethylamine salt	AMINE 4 2,4-D	Loveland Products, Inc.	Group 4	34704-120
2,4-D, dimethylamine salt	AMINE 4 2,4-D HERBICIDE	TENKOZ, Inc.	Group 4	42750-19-55467
2,4-D, dimethylamine salt	AMINE 4 2,4-D, TENKOZ	TENKOZ, Inc.	Group 4	71368-1-55467
2,4-D, dimethylamine salt	CLEAN AMINE	Loveland Products, Inc.	Group 4	34704-120
2,4-D, dimethylamine salt	OPTI-AMINE	Helena Chemical Company	Group 4	5905-501
2,4-D, dimethylamine salt	SABER	Loveland Products, Inc.	Group 4	34704-803
2,4-D, dimethylamine salt	SOLUTION WATER SOLUBLE	Nufarm Agricultural Products	Group 4	228-260
2,4-D, dimethylamine salt	WEEDAR 64	Nufarm Agricultural Products	Group 4	71368-1
2,4-D, dimethylamine salt	WEDESTROY AM-40 AMINE SALT	Nufarm Agricultural Products	Group 4	228-145
2,4-D, dimethylamine salt + Dicamba, dimethylamine salt	BRASH HERBICIDE	Winfield Solutions LLC	Group 4; Group 4	1381-202
2,4-D, dimethylamine salt + Dicamba, dimethylamine salt	RANGESTAR	Albaugh, Inc./Agri Star	Group 4; Group 4	42750-55
2,4-D, dimethylamine salt + Dicamba, dimethylamine salt	RIFLE-D	Loveland Products, Inc.	Group 4; Group 4	34704-869
2,4-D, dimethylamine salt + Dicamba, dimethylamine salt	WEEDMASTER	Nufarm Agricultural Products	Group 4; Group 4	71368-34
2,4-D + Dicamba	LATIGO	Helena Chemical Company	Group 4; Group 4	5905-564
Asulam-sodium	ASULAM HERBICIDE	Loveland Products, Inc.	Group 18	34704-904
Asulam-sodium	ASULOX	United Phosphorus, Inc.	Group 18	70506-139
Atrazine	AATREX 4L HERBICIDE	Syngenta Crop Protection, LLC	Group 5	100-497
Atrazine	AATREX NINE-O	Syngenta Crop Protection, LLC	Group 5	100-585
Atrazine	ATRAZINE 4 L	Winfield Solutions LLC	Group 5	1381-158

SUGARCANE WEED MANAGEMENT**TABLE 2. GLOSSARY OF HERBICIDES REGISTERED FOR USE IN SUGARCANE IN LOUISIANA.¹**

Atrazine	ATRAZINE 4 L HERBICIDE	Helena Chemical Company	Group 5	5905-470
Atrazine	ATRAZINE 4L	Loveland Products, Inc.	Group 5	34704-69
Atrazine	ATRAZINE 4L (DREXEL)	Drexel Chemical Company	Group 5	19713-11
Atrazine	ATRAZINE 4L HERBICIDE	MANA - Makhteshim Agan of North America, Inc.	Group 5	66222-36
Atrazine	ATRAZINE 4L HERBICIDE	TENKOZ, Inc.	Group 5	100-497-55467
Atrazine	ATRAZINE 90 DF	Winfield Solutions LLC	Group 5	9779-253
Atrazine	ATRAZINE 90 DF HERBICIDE	MANA - Makhteshim Agan of North America, Inc.	Group 5	66222-37
Atrazine	ATRAZINE 90 WDG	Loveland Products, Inc.	Group 5	34704-622
Atrazine	ATRAZINE 90DF HERBICIDE	TENKOZ, Inc.	Group 5	100-585-55467
Atrazine	HELENA ATRAZINE 4F	Helena Chemical Company	Group 5	100-497-5905
Carfentrazone-ethyl	AIM EC HERBICIDE	FMC Corporation Agricultural Products Group	Group 14	279-3241
Carfentrazone-ethyl	AIM EW HERBICIDE	FMC Corporation Agricultural Products Group	Group 14	279-3242
Clomazone	COMMAND 3 ME	Helena Chemical Company	Group 13	279-3158-5905
Clomazone	COMMAND 3ME	FMC Corporation Agricultural Products Group	Group 13	279-3158
Dicamba	VISION HERBICIDE	Helena Chemical Company	Group 4	5905-576
Dicamba, diglycolamine salt	CLARITY HERBICIDE	BASF Ag Products	Group 4	7969-137
Dicamba, diglycolamine salt	CLASH	Nufarm Agricultural Products	Group 4	228-615
Dicamba, diglycolamine salt	DETONATE	TENKOZ, Inc.	Group 4	7969-137-55467
Dicamba, diglycolamine salt	STERLING BLUE	Winfield Solutions LLC	Group 4	7969-137-1381
Dicamba, diglycolamine salt	STRUT	Loveland Products, Inc.	Group 4	34704-1043
Dicamba, dimethylamine salt	BANVEL HERBICIDE	Arysta LifeScience North America LLC	Group 4	66330-276
Dicamba, dimethylamine salt	DIABLO HERBICIDE	Nufarm Agricultural Products	Group 4	228-379
Dicamba, dimethylamine salt	RIFLE	Loveland Products, Inc.	Group 4	34704-861
Diuron	DIREX 4 L	MANA - Makhteshim Agan of North America, Inc.	Group 7	66222-54
Diuron	DIREX 4L HERBICIDE	DuPont Crop Protection	Group 7	352-678
Diuron	DIURON 4 L	Winfield Solutions LLC	Group 7	9779-329
Diuron	DIURON 4L	Drexel Chemical Company	Group 7	19713-36
Diuron	DIURON 4L HERBICIDE	MANA - Makhteshim Agan of North	Group 7	66222-54

SUGARCANE WEED MANAGEMENT**TABLE 2. GLOSSARY OF HERBICIDES REGISTERED FOR USE IN SUGARCANE IN LOUISIANA.¹**

		America, Inc.		
Diuron	DIURON 80	Drexel Chemical Company	Group 7	19713-274
Diuron	DIURON 80 WDG WEED KILLER	Loveland Products, Inc.	Group 7	34704-648
Diuron	DIURON 80DF	MANA - Makhteshim Agan of North America, Inc.	Group 7	66222-51
Diuron	DIURON-4L HERBICIDE	Loveland Products, Inc.	Group 7	34704-854
Diuron	PARROT DF	MANA - Makhteshim Agan of North America, Inc.	Group 7	66222-51
Diuron	SEKOR 4L	MANA - Makhteshim Agan of North America, Inc.	Group 7	66222-54
Diuron	SUPERDI 4L	MANA - Makhteshim Agan of North America, Inc.	Group 7	66222-54
EPTC	EPTAM 7-E	Gowan Company	Group 8	10163-283
Flumioxazin	VALOR SX	Valent U.S.A. Corporation Agricultural Products	Group 14	59639-99
Halosulfuron-methyl	PERMIT	Gowan Company	Group 2	81880-2-10163
Halosulfuron-methyl	SANDEA	Gowan Company	Group 2	81880-18-10163
Halosulfuron-methyl + Dicamba, sodium salt	YUKON HERBICIDE	Gowan Company	Group 4; Group 2	81880-6-10163
Hexazinone	VELOSSA	Helena Chemical Company	Group 5	5905-579
Hexazinone	VELPAR DF	DuPont Crop Protection	Group 5	352-581
Hexazinone	VELPAR L HERBICIDE	DuPont Crop Protection	Group 5	352-392
Mesotrione	CALLISTO	Syngenta Crop Protection, LLC	Group 27	100-1131
Mesotrione + Atrazine	CALLISTO XTRA	Syngenta Crop Protection, LLC	Group 5; Group 27	100-1359
Metribuzin	DIMETRIC DF 75%	Winfield Solutions LLC	Group 5	1381-197
Metribuzin	GLORY	MANA - Makhteshim Agan of North America, Inc.	Group 5	66222-106
Metribuzin	METRI 4F	United Phosphorus, Inc.	Group 5	70506-68
Metribuzin	METRI DF HERBICIDE	United Phosphorus, Inc.	Group 5	70506-103
Metribuzin	METRIBUZIN 75	Loveland Products, Inc.	Group 5	34704-876
Metribuzin	METRIBUZIN 75DF	MANA - Makhteshim Agan of North America, Inc.	Group 5	66222-106
Metribuzin	TRICOR 4F	United Phosphorus, Inc.	Group 5	70506-68
Metribuzin	TRICOR DF	United Phosphorus, Inc.	Group 5	70506-103
MSMA	MSMA-6 PLUS	Drexel Chemical Company	Group 17	19713-42

SUGARCANE WEED MANAGEMENT**TABLE 2. GLOSSARY OF HERBICIDES REGISTERED FOR USE IN SUGARCANE IN LOUISIANA.¹**

Paraquat dichloride	BONFIRE	United Phosphorus, Inc.	Group 22	70506-239
Paraquat dichloride	FIRESTORM	Chemtura USA Corporation	Group 22	82557-1-400
Paraquat dichloride	GRAMOXONE INTEON	Syngenta Crop Protection, LLC	Group 22	100-1217
Paraquat dichloride	GRAMOXONE SL	Syngenta Crop Protection, LLC	Group 22	100-1217
Paraquat dichloride	GRAMOXONE SL 2.0	Syngenta Crop Protection, LLC	Group 22	100-1431
Paraquat dichloride	HELMQUAT 3SL	HELM AGRO US, Inc.	Group 22	74530-48
Paraquat dichloride	PARAQUAT CONCENTRATE	Solera Source Dynamics, LLC	Group 22	82542-3
Paraquat dichloride	PARA-SHOT 3.0	Sharda USA LLC	Group 22	83529-27
Paraquat dichloride	PARAZONE 3SL	MANA - Makhteshim Agan of North America, Inc.	Group 22	66222-130
Paraquat dichloride	QUIK-QUAT	Drexel Chemical Company	Group 22	19713-617
Pendimethalin	ACUMEN	TENKOZ, Inc.	Group 3	241-337-55467
Pendimethalin	FRAMEWORK 3.3 EC	Winfield Solutions LLC	Group 3	1381-216
Pendimethalin	PENDANT 3.3 EC	Winfield Solutions LLC	Group 3	241-337-1381
Pendimethalin	PENDIPRO 3.3 EC	Independent Agribusiness Professionals, Inc.	Group 3	241-337-71058
Pendimethalin	PROWL 3.3 EC HERBICIDE	BASF Ag Products	Group 3	241-337
Pendimethalin	PROWL H2O	BASF Ag Products	Group 3	241-418
Pendimethalin	STEALTH	Loveland Products, Inc.	Group 3	34704-868
Sulfentrazone	SPARTAN 4F HERBICIDE	FMC Corporation Agricultural Products Group	Group 14	279-3220
Sulfentrazone + Metribuzin	AUTHORITY MTZ DF	FMC Corporation Agricultural Products Group	Group 5; Group 14	279-3340
Terbacil	SINBAR WDG	Tessengerlo Kerley, Inc. (NovaSource)	Group 5	61842-27
2,4-D, butoxyethyl ester+ Triclopyr, butoxyethyl ester	CANDOR	Nufarm Agricultural Products	Group 4; Group 4	228-565
2,4-D, butoxyethyl ester+ Triclopyr, butoxyethyl ester	CROSSBOW HERBICIDE	Dow AgroSciences LLC	Group 4; Group 4	62719-260
2,4-D, butoxyethyl ester+ Triclopyr, butoxyethyl ester	CROSSBOW L	Loveland Products, Inc.	Group 4; Group 4	62719-260-34704
2,4-D, butoxyethyl ester+ Triclopyr, butoxyethyl ester	CROSSBOW, TENKOZ	TENKOZ, Inc.	Group 4; Group 4	62719-260-55467
2,4-D, dimethylamine salt+ Triclopyr, triethylamine salt	AQUASWEEP	Nufarm Agricultural Products	Group 4; Group 4	228-316

SUGARCANE WEED MANAGEMENT**TABLE 2. GLOSSARY OF HERBICIDES REGISTERED FOR USE IN SUGARCANE IN LOUISIANA.¹**

Triclopyr	ELEMENT 4	Dow AgroSciences LLC	Group 4	62719-40
Triclopyr	RELEGATE RTU	Nufarm Agricultural Products	Group 4	228-552
Triclopyr, butoxyethyl ester	GARLON 4	Dow AgroSciences LLC	Group 4	62719-40
Triclopyr, butoxyethyl ester	GARLON 4 ULTRA	Dow AgroSciences LLC	Group 4	62719-527
Triclopyr, butoxyethyl ester	PATHFINDER II	Dow AgroSciences LLC	Group 4	62719-176
Triclopyr, butoxyethyl ester	REMEDY ULTRA	Dow AgroSciences LLC	Group 4	62719-552
Triclopyr, butoxyethyl ester	TAHOE 4E HERBICIDE	Nufarm Agricultural Products	Group 4	228-517
Triclopyr, triethylamine salt	GARLON 3A	Dow AgroSciences LLC	Group 4	62719-37
Triclopyr, triethylamine salt	PLATFORM HERBICIDE	Nufarm Agricultural Products	Group 4	228-520
Triclopyr, triethylamine salt	TAHOE 3A	Nufarm Agricultural Products	Group 4	228-520
Trifloxysulfuron-Sodium	ENVOKE	Syngenta Crop Protection, LLC	Group 2	100-1132
Trifluralin	DINTEC TREFLAN 4D HERBICIDE	Dintec Agrichemicals	Group 3	68156-4
Trifluralin	TREFLAN 4 EC HERBICIDE	Helena Chemical Company	Group 3	5905-532
Trifluralin	TREFLAN 4L	Loveland Products, Inc.	Group 3	34704-853
Trifluralin	TREFLAN HFP	Dow AgroSciences LLC	Group 3	62719-250
Trifluralin	TREFLAN TR-10 HERBICIDE	Dow AgroSciences LLC	Group 3	62719-131
Trifluralin	TRIFLURALIN 10G	Loveland Products, Inc.	Group 3	34704-790
Trifluralin	TRIFLURALIN 4 E.C., HELENA	Helena Chemical Company	Group 3	5905-519
Trifluralin	TRIFLURALIN 4 EC (AGRI STAR)	Albaugh, Inc./Agri Star	Group 3	42750-32
Trifluralin	TRIFLURALIN 4 EC, TENKOZ	TENKOZ, Inc.	Group 3	62719-250-55467
Trifluralin	TRIFLURALIN 4EC, TENKOZ	TENKOZ, Inc.	Group 3	66222-46-55467
Trifluralin	TRIFLURALIN HF	Loveland Products, Inc.	Group 3	34704-792
Trifluralin	TRIFLUREX HFP	MANA - Makhteshim Agan of North America, Inc.	Group 3	66222-46
Trifluralin	TRUST 10G	Winfield Solutions LLC	Group 3	62719-131-1381
Trifluralin	TRUST HERBICIDE	Winfield Solutions LLC	Group 3	1381-146

¹Information provided by the Louisiana Department of Agriculture and Forestry through the [Pesticide Registration](#) website and from the [CDMS](#) website. This list is not inclusive of all products available. See herbicide label for specific crops and uses. The LSU AgCenter does not recommend or endorse specific herbicide brands.

SUGARCANE WEED MANAGEMENT

TABLE 3. GLYPHOSATE PRODUCTS REGISTERED FOR USE IN LOUISIANA WITH SURFACTANT RECOMMENDATIONS.¹

Trade name	Manufacturer or distributor	Glyphosate concentration ²			Rate equivalent based on 4 lb ai/gal product		
		Acid equivalent (a.e.)	Active ingredient (a.i.)	Need for non-ionic surfactant ³	1.0 qt	1.5 qt	2.0 qt
Abundit Extra	Nufarm	3	4	No	1.0	1.5	2.0
Atila	Nufarm	3	4	May be added*	1.0	1.5	2.0
Atila Extra	Nufarm	3	4	No	1.0	1.5	2.0
Atila Plus	Nufarm	3	4	No	1.0	1.5	2.0
Buchaneer	Tenkoz	3	4	May be added**	1.0	1.5	2.0
Buchaneer Plus	Tenkoz	3	4	May be added***	1.0	1.5	2.0
Buchaneer 5	Tenkoz	-	5	May be added*	0.8	1.2	1.6
Cornerstone	AgriSolutions (Winfield)	3	4	May be added**	1.0	1.5	2.0
Cornerstone Plus	AgriSolutions (Winfield)	3	4	May be added***	1.0	1.5	2.0
Cornerstone 5 Plus	AgriSolutions (Winfield)	4	5.5	Can be added****	0.75	1.1	1.5
Credit 4I	Nufarm	3	4	No	1.0	1.5	2.0
Credit 4I Extra	Nufarm	3	4	No	1.0	1.5	2.0
Credit Mixed Salt	Nufarm	3	3.4	May be added*	1.15	1.7	2.3
Credit Extra Mixed Salt	Nufarm	3	3.4	May be added*	1.15	1.7	2.3
Credit Duo	Nufarm	3	4	May be added*	1.0	1.5	2.0
Credit Duo Extra	Nufarm	3	4	No	1.0	1.5	2.0
Credit Systemic	Nufarm	3	4	May be added*	1.0	1.5	2.0
Credit Systemic Extra	Nufarm	3	4	No	1.0	1.5	2.0
Credit Xtreme	Nufarm	-	4.5	No	0.9	1.3	1.8
Crop-Sure Glyphosate Plus	Universal Crop Protection	3	4	May be added***	1.0	1.5	2.0
Czar	Fusion Technologies	3	4	No	1.0	1.5	2.0
Deal	Tenkoz	3	4	May be added**	1.0	1.5	2.0
Deal Plus	Tenkoz	3	4	May be added***	1.0	1.5	2.0
Debit TMF	Nufarm	4	5.4	Yes*	0.75	1.1	1.5
Durango	Dow AgroSciences	4	5.4	No	0.75	1.1	1.5

SUGARCANE WEED MANAGEMENT

TABLE 3. GLYPHOSATE PRODUCTS REGISTERED FOR USE IN LOUISIANA WITH SURFACTANT RECOMMENDATIONS.¹

Trade name	Manufacturer or distributor	Glyphosate concentration ²			Rate equivalent based on 4 lb ai/gal product		
		Acid equivalent (a.e.)	Active ingredient (a.i.)	Need for non-ionic surfactant ³	1.0 qt	1.5 qt	2.0 qt
Durango DMA	Dow AgroSciences	4	5.4	No	0.75	1.1	1.5
Four Power Plus	Loveland	3	4	No	1.0	1.5	2.0
Genesis Extra	Farm Advantage	3	4	May be added**	1.0	1.5	2.0
Genesis Extra II	Farm Advantage	3	4	May be added**	1.0	1.5	2.0
Gly-4	Universal Crop Protection	3	4	May be added**	1.0	1.5	2.0
Gly-4 Plus	Universal Crop Protection	3	4	May be added***	1.0	1.5	2.0
Glycana Plus 4I	Arcana	3	4	No	1.0	1.5	2.0
Glyfine Plus	Aceto	3	4	May be added***	1.0	1.5	2.0
Glyfos	Cheminova	3	4	May be added**	1.0	1.5	2.0
Glyfos X-tra	Cheminova	3	4	No	1.0	1.5	2.0
Glypho 4I	UPI	3	4	May be added***	1.0	1.5	2.0
Glyphogan	Makhteshim Agan of N.A.	3	4	May be added**	1.0	1.5	2.0
Glyphomax XRT	Dow AgroSciences	4	5.4	No	0.75	1.1	1.5
Glyphosate 4	Alligare	3	4	May be added**	1.0	1.5	2.0
Glyphosate 4I Plus	CropSmart	3	4	May be added**	1.0	1.5	2.0
Glyphosate Plus	Crop-Sure	3	4	May be added***	1.0	1.5	2.0
Glyphosate 5.4	Alligare	4	5.4	Yes**	0.75	1.1	1.5
Gly Pho-Sel Pro 41%	Agrisel	3	4	No	1.0	1.5	2.0
Glysort	Glysortia	3	4	May be added**	1.0	1.5	2.0
Glysort Plus	Glysortia	3	4	No	1.0	1.5	2.0
Gly Star Gold	Albaugh	3	4	No	1.0	1.5	2.0
Gly Star Original	Albaugh	3	4	May be added**	1.0	1.5	2.0
Gly Star Plus	Albaugh	3	4	No	1.0	1.5	2.0
Gly Star Pro	Albaugh	3	4	No	1.0	1.5	2.0
GlySupreme Plus	MEY Corp.	3	4	No	1.0	1.5	2.0
Grandslam 4XS	AGRI Packaging & Logistics	3	4	May be added***	1.0	1.5	2.0

SUGARCANE WEED MANAGEMENT

TABLE 3. GLYPHOSATE PRODUCTS REGISTERED FOR USE IN LOUISIANA WITH SURFACTANT RECOMMENDATIONS.¹

Trade name	Manufacturer or distributor	Glyphosate concentration ²			Rate equivalent based on 4 lb ai/gal product		
		Acid equivalent (a.e.)	Active ingredient (a.i.)	Need for non-ionic surfactant ³	1.0 qt	1.5 qt	2.0 qt
Helosate 70	Helm Agro US	4.72	6.3	May be added**	0.64	1.0	1.3
Helosate 75 SG	Helm Agro US	68.9	75	May be added**	1.3 ⁴	2.0 ⁴	2.6 ⁴
Helosate Plus	Helm Agro US	3	4	May be added**	1.0	1.5	2.0
Helosate Pro	Helm Agro US	3	4	May be added**	1.0	1.5	2.0
Honcho	Monsanto	3	4	May be added***	1.0	1.5	2.0
Honcho Plus	Monsanto	3	4	May be added***	1.0	1.5	2.0
Hoss Ultra	Helena	3	4	No	1.0	1.5	2.0
Lajj Plus	Northmoose Chemicals	3	4	No	1.0	1.5	2.0
Mad Dog	Loveland	3	4	May be added**	1.0	1.5	2.0
Mad Dog Plus	Loveland	3	4	No	1.0	1.5	2.0
Makaze	Loveland	3	4	No	1.0	1.5	2.0
Meychem 41% Glyphosate	MEY Corporation	3	4	Can be added****	1.0	1.5	2.0
Mirage	Loveland	3	4	May be added**	1.0	1.5	2.0
Mirage Plus	Loveland	3	4	No	1.0	1.5	2.0
Rascal	Winfield Solutions	3	4	May be added***	1.0	1.5	2.0
Rascal Plus	Winfield Solutions	3	4	May be added***	1.0	1.5	2.0
Rascal Plus Glyphosate 41%	Agriliance	3	4	May be added***	1.0	1.5	2.0
Reserve 41 Plus	National Ag Chem Assoc.	3	4	No	1.0	1.5	2.0
Roughneck	Nufarm	3	4	No	1.0	1.5	2.0
Roundup Original	Monsanto	3	4	May be added***	1.0	1.5	2.0
Roundup OriginalMax	Monsanto	4.5	5.5	May be added*****	0.75	1.1	1.5
Roundup PowerMax	Monsanto	4.5	5.5	May be added*****	0.75	1.1	1.5
Roundup WeatherMax	Monsanto	4.5	5.5	No	0.75	1.1	1.5
StrikeOut Loaded	Libertas Now	3	4	May be added**	1.0	1.5	2.0
Tomahawk	United Suppliers	3	4	May be added****	1.0	1.5	2.0
Tomahawk 5	United Suppliers	4	5.4	Yes***	0.75	1.1	1.5

SUGARCANE WEED MANAGEMENT

TABLE 3. GLYPHOSATE PRODUCTS REGISTERED FOR USE IN LOUISIANA WITH SURFACTANT RECOMMENDATIONS.¹

Trade name	Manufacturer or distributor	Glyphosate concentration ²			Rate equivalent based on 4 lb ai/gal product		
		Acid equivalent (a.e.)	Active ingredient (a.i.)	Need for non-ionic surfactant ³	1.0 qt	1.5 qt	2.0 qt
Touchdown HiTech	Syngenta	5	--	Yes****	0.6	0.9	1.2
Touchdown Total	Syngenta	4.17	--	No	0.72	1.1	1.44
Traxion	Syngenta	4.17	--	No	0.72	1.1	1.44
Willowood Glyphosate 41%	Willowood LLC	3	4	No	1.0	1.5	2.0
Wise Up Plus	MEY Corporation	3	4	No	1.0	1.5	2.0
Z-Glyphosate 41 Max	Fusion Technologies	3	4	No	1.0	1.5	2.0

¹ Information provided by the Louisiana Department of Agriculture and Forestry through the [Pesticide Registration](#) website and the [CDMS](#) website. This list does not include all available glyphosate products. See herbicide label for specific crops and uses. The LSU AgCenter does not recommend or endorse specific herbicide brands.

² Glyphosate concentration can be expressed based on “acid equivalent” (a.e.) or on “active ingredient” (a.i.). Both concentrations usually are provided on the herbicide label. For glyphosate products, the active portion of the herbicide molecule (the part that provides weed control) is the acid. To formulate a usable and stable product, the glyphosate parent acid is attached to a salt (e.g., isopropyl amine, potassium, etc.), increasing the molecular weight of the molecule but not affecting herbicidal activity. Therefore, the a.i. designation is always a larger number.

³ Most formulations of glyphosate contain some surfactant. The need for additional surfactant is based on how much surfactant is present in the formulation and the quality of the surfactant. The herbicide label may state that no additional surfactant is needed or recommended, that surfactant may be added or that surfactant is required and the amount is specified. It is critical that surfactant be added if required. Always consult the label for specific information on the need for surfactants and other adjuvants. For the products listed in Table 3 in regard to the need for surfactant, **No**= Label specifies that surfactant is not needed or nothing is included in reference to surfactant. **Yes**= * For surfactant at least 80% active, add 2 or more quarts unless otherwise indicated in specific crop or noncrop directions for using the product; ** For surfactant at least 50% active, add 2 or more quarts per 100 gal. water; *** For surfactant at least 70% active, add 2-4 quarts per 100 gal. water; **** For surfactant at least 75% active, add at 0.25-0.5%. **May be or Can be applied**= * For surfactant at least 80% active, add at 0.375% volume; ** For surfactant at least 70% active, add at 0.5% volume; less than 70% active ingredient add at 1% volume. *** Use surfactant at least 70% active. **** Surfactant active ingredient and rate not specified. ***** Recommended when carrier volume is above 30 gal per acre or when product application rate is less than 16 oz/A; use surfactant at least 70% active and add at 0.25-0.5% volume; less than 70% active ingredient, add at 1% volume. Note: 0.25% volume = 1 qt/100 gal; 0.375% volume = 1.5 qt/100 gal; 0.5% volume = 2 qt/100 gal; 1% volume = 4 qt (1 gal) /100 gal.

⁴ Rate in pounds/A.

Note: For AMS (ammonium sulfate), labels for all glyphosate products state that addition of AMS may increase performance.

PEANUT WEED MANAGEMENT

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREPLANT:			
ethalfluralin @ 0.56-1.13 lb/A	Sonalan HFP @ 1.5-3.0 pt/A	Most annual grasses; many small-seed annual broadleaf weeds	Soil incorporate 2-3 inches deep soon after application. Bedding must not expose untreated soil. Use low rate for light and high rate for heavy soils.
pendimethalin @ 0.74-0.99 lb/A	Prowl 3.3 EC @ 1.8-2.4 pt/A	Annual grasses; small-seeded broadleaves	Apply at preplant incorporated up to 45 days before planting. For best performance incorporate within 7 days of applications.
PREPLANT or PREEMERGENCE:			
diclosulam @ 0.024 lb/A	Strongarm @ 0.45 oz/A	Broadleaf weeds	Soil incorporate 1-3 inches deep. Should be tank-mixed with a grass herbicide. If surface-applied, at least 0.25-0.5 inches of supplemental moisture is needed for activation. See label for complete rotation restrictions: cotton = 10 months; corn = 18 months (IR hybrids = 10 months); soybean = 0 months.
flumioxazin @ 0.096lb/A	Valor @ 3 oz/A	Pigweeds, sida; other broadleaf weeds; some grass suppression.	Apply after planting, but no later than 2 days after planting. Do not irrigate when peanuts are cracking. Rainfall or irrigation at cracking will cause temporary crop injury that should result in reduced yields if applied according to the label.
imazethapyr @ 0.0625 lb/A	Pursuit 2E @ 4 oz/A Rate may be split 4 oz/A preplant incorporated or preemergence followed by 4 oz/A postemergence	Several broadleaf weeds, many annual grasses, yellow nutsedge, purple nutsedge	Do not apply more than 4 oz./A of Pursuit during the growing season. Do not graze or feed treated forage to livestock. See label for complete rotation restrictions: cotton = 18 months; wheat = 4 months.
S-metolachlor @ 0.95 - 1.27 lb/A	Dual Magnum @ 1-1.33 pt/A	Annual grasses and pigweed; poor control of large-seeded broadleaf weeds	For preplant incorporation, apply within 14 days of planting. For preemergence (soil surface), apply after planting and before weeds emerge. May be tank-mixed with other PRE herbicide; consult label.
POSTEMERGENCE:			
2,4-DB @ 0.2-0.4 lb/A	1.75 lb/gal formulation @ 0.9-1.75 pt/A	Cocklebur, morningglory; fair control of other broadleaf weeds	Apply when weeds are small and actively growing, 2-12 weeks after planting. Low rates control cocklebur, highest rate for other weeds. Do not apply within 30 days of harvest. See label for restrictions.
acifluorfen @ 0.25-0.50 lb/A	2 lb/gal formulation @ 0.8-1.6 pt/A Ultra Blazer @ 1.0-2.0 pts/A Adjuvant required; see label	Pigweed, morningglory, wild poinsettia, sesbania	Apply when weeds have 2-4 leaves. Do not apply to crop or weeds under stress. Do not apply Ultra Blazer within 75 days of harvest. Do not apply more than 2 pts/A during growing season. Rainfall received within 6 hours of application may reduce control. Do not graze or feed treated foliage to livestock.

PEANUT WEED MANAGEMENT

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE continued:			
bentazon @ 0.75-1.0 lb/A	Basagran 4E @ 1.5-2.0 pt/A	Several broadleaf weeds; little to no control of morningglory species	Early postemergence when weeds are small and actively growing. Thorough coverage of weeds is essential. Do not apply if peanuts are under stress.
bentazon @ 0.5 lb/A + aciflurofen @ 0.25 lb/A	Storm 4EC @ 1.5 pt/A Apply with 1-2 pt of NIS/100 gallons of water	Several broadleaf weeds; increased control of morningglories over Basagran alone	Do not apply if peanuts are under stress. Do not apply more than a total of 1.5 pints of Storm within 75 days of peanut harvest.
clethodim @ 0.09 – 0.25 lb/A	Select 2EC @ 6–16 oz/A Apply with COC @ 2 pt/A	Annual and perennial grasses	Apply before grasses exceed height limit. Do not apply within 40 days of harvest. Other clethodim formulations have similar labeling.
imazapic @ 0.063 lb/A	Cadre @ 4 oz/A Apply with 1 qt of NIS/100 gallons of water	Several broadleaf species and nutsedge species; control or suppression of some grass species	See label for details, precautions and plant-back intervals. For sicklepod, apply in combination with 2,4-DB.
imazethapyr @ 0.063 lb/A	Pursuit 2E @ 4 oz/A Rate may be split 2 oz/A preplant incorporated or preemergence followed by 2 oz/A postemergence	Several broadleaf weeds, many annual grasses, yellow nutsedge, purple nutsedge	Do not (1) apply more than 4 oz./A of Pursuit during the growing season; (2) graze or feed treated forage to livestock; or (3) apply within 45 days of harvest. See label for complete rotation restrictions: cotton = 18 months; wheat = 4 months.
lactofen @ 0.195 lb/A	Cobra 2EC @ 12.5 oz/A Apply with 1% COC.	Control of pigweeds, morningglories, copperleaf, wild poinsettia, eclipta	Apply after peanuts reach the 6 true-leaf stage. Preharvest interval is 90 days.
paraquat @ 0.125 lb/A	paraquat (2 lb/gal formulation) @ 8 oz/A; paraquat (3 lb/gal formulation) @ 5.33 oz/A Apply with NIS @ 1 qt/100 gal	Several grass and broadleaf weeds; when used alone, not effective on prickly sida or tropic croton	Apply at cracking or early postemergence up to 14 days after ground cracking. After that time, use in combination with Basagran or Storm. Peanut foliage injury is usually temporary. Conditions of high humidity, wet foliage and/or wet soils result in greater foliage burn. Thrips injury retards crop recovery.
paraquat @ 0.189 lb/A + bentazon @ 0.25-0.5 lb/A OR + bentazon @ 0.33-0.5 lb/A + aciflurofen @ 0.17-0.25	paraquat (2 lb/gal formulation) @ 12 oz/A; paraquat (3 lb/gal formulation) @ 8 oz/A + Basagran @ 0.5-1.0 pt/A OR + Storm @ 1.0-1.5 pt/A Apply with NIS @ 1 qt/A/100 gal	Small, emerged annual grass and many broadleaf weeds	Apply at cracking or early postemergence up to 28 days after ground cracking. Do not apply after flower initiation. Do not make more than 2 applications per crop. One pint is needed for nutsedge control. Use 0.5 pt./A of Basagran if added only as a safener.
sethoxydim @ 0.19-0.38 lb/A	Poast Plus @ 1.0-2.0 pt/A Apply with COC @ 2 pt/A	Annual and perennial grasses	Apply before grasses exceed height limit. Do not apply to grasses under stress. Do not apply within 70 days of harvest.

HOME GARDEN WEED MANAGEMENT

HOME GARDENS

Active Ingredient	Product Rate per 1000 sq ft/1 gal ¹	Remarks and Precautions
BURNDOWN:		
glyphosate ¹	Roundup Ultra/others @ 0.5-1 oz/1000 sq ft. Several brands available; consult labels for proper rates.	Apply postemergence on weeds. A nonselective, post-emerge to be used before planting or crop emergence on actively growing weeds. Consult product label for plant back intervals. Avoid spray drift to desirable plants. Spray weeds to wet but not to drip. Crops labeled include beets, carrots, celery, corn, cole crops, English and southern peas, Irish potatoes, Jerusalem artichoke, lima and snap beans, lettuce, greens, okra, onion, garlic, peanuts, radish, soybeans, sweet potatoes and asparagus (before spears appear).
PREPLANT INCORPORATED:		
trifluralin	Treflan 4 EC @ 1/3 fl oz/1,000 sq ft on medium soil 1/2 fl oz/1,000 sq ft on heavy soils	Apply before planting and incorporate. Use on snap or lima beans, cole crops, Irish potatoes, sunflowers and greens. Incorporate before transplanting tomatoes, cole crops, pepper and celery. Also for asparagus beds and at half rate postemergence (crop) between onion rows. Treflan controls many small-seeded broadleaf weeds (pigweeds) and annual grasses.
PREEMERGENCE (before crops or weeds emerge):		
metolachlor	Dual 8E @ 1/2 oz/1,000 sq ft on sandy soil 1.0 fl. oz/1,000 sq ft on medium-heavy soil	Apply before or after planting snap or lima beans, soybeans, sweet corn, peanuts, popcorn, Irish potatoes, southern peas, English peas and chickpeas. Apply after planting snap or lima beans, sweet corn, peanuts, popcorn, Irish potatoes, southern pecans, English peas and chickpeas. Provides good residual grass control and controls some broadleaf weeds. Will not control emerged weeds.
DCPA	Dacthal 75% WP @ 4.0 oz/1,000 sq ft on sandy soil 5.0 oz./1,000 sq. ft. on med-heavy soil	Apply after planting snap beans (not limas), southern peas, greens, radish, garlic, onion, cole crops, Irish or sweet potatoes. Apply after transplanting tomatoes, peppers, cole crops and cucurbits. Apply 4-6 weeks after transplanting eggplants. Controls many annual grasses and some broadleaf weeds.
POSTEMERGENCE (after crop and weeds emerge):		
bentazon	Basagran 4 EC @ 1/2-3/4 oz/1,000 sq ft	Snap or lima beans, mint, southern peas, peanuts, English peas and corn. Apply to small actively growing broadleaf weeds and yellow nutsedge. This treatment will not kill grasses. Very effective on yellow nutsedge. May need an adjuvant; see label.
fluazifop	Fusilade DX @ 0.5 oz/1,000 sq ft Apply with NIS @ 0.33 oz/gal	Spray on young actively growing grassy weeds. Spray to wet weed foliage. Use on asparagus, carrots, onions, spinach, sweet potatoes, hot peppers and non-bell peppers.

HOME GARDEN WEED MANAGEMENT

HOME GARDENS

Active Ingredient	Product Rate per 1000 sq ft/1 gal ¹	Remarks and Precautions
POSTEMERGENCE (after crop and weeds emerge) continued:		
sethoxydim	Poast & various other trade names @ 1 oz/1000 sq ft Consult product label concerning surfactants	Spray on young, actively growing grassy weeds. Spray to wet weed foliage. Use on asparagus, beans, cole crops, cabbage, cucumbers, peanuts, greens, lettuce, melons, peas, peppers, pumpkins, potatoes, squash or tomatoes. Sethoxydim may be found under various trade names like Poast, Hi-Yield Grass Killer and Ferti-lome Over the Top II

¹ The rates given in column 2 (Product Rate) are based on the amount of material needed to treat 1,000 square feet. This amount of herbicide plus adjuvant (if required) should be diluted in 1 gal. of water and evenly distributed over 1,000 sq. ft. To find the amount of product needed if the area treated is different from 1,000 sq. ft., use the following formula: [product rate, in oz. (column 2) x (area to be treated, in sq. ft. ÷ 1,000)]. To find the volume necessary to spray, use the following formula: [area to be treated, in sq. ft. ÷ 1,000]. Example: area to be treated is 2,500 sq. ft. Want to spray Fusilade DX @ 0.5 oz/1,000 sq. ft. Total product needed: [0.5 x (2,500 ÷ 1000)] or 1.25 oz. Total volume needed is [2,500 ÷ 1,000] or 2.5 gal..

² Refer to "Appendix A" for more information on various glyphosate brands and formulations.

LAWN AND TURF WEED MANAGEMENT

TABLE I. Turfgrass tolerance to selected herbicides*

	Bermudagrass	Centipedegrass	St. Augustinegrass	Zoysiagrass		Bermudagrass	Centipedegrass	St. Augustinegrass	Zoysiagrass
PREEMERGENCE HERBICIDES					POSTEMERGENCE HERBICIDES				
atrazine	D	T	T	T	2,4-D	T	I	I	T
benefin	T	T	T	T	2,4-D + mecoprop + dicamba	T	I	I	T
benefin + oryzalin	T	T	T	T	atrazine	D	T	T	T
bensulide	T	T	T	T	bentazon	T	T	T	T
bensulide + oxadiazon	T	NR	NR	T	carfentrazone	T	T	T	T
dithiopyr	T	T	T	T	chlorsulfuron	T	T-I	T-I	T
isoxaben	T	T	T	T	clopyralid	T	T	T	T
metolachlor	T	T	T	T	dicamba	T	I	I	T
oryzalin	T	T	T	T	diclofop	T	NR	NR	NR
oxadiazon	T	NR	T	T	fenoxaprop	NR	NR	NR	T
pendimethalin	T	T	T	T	fluazifop	NR	NR	NR	I
prodiamine	T	T	T	T	foramsulfuron	T	NR	NR	T
simazine	I	T	T	T	imazaquin	T	T	T	T
sulfentrazone + prodiamine	T	T	NR	T	iodosulfuron + thiencazone + dicamba	T	T	T	T
indaziflam	T	T	T	T	metribuzin	T-I	NR	NR	NR
*Abbreviations:					metsulfuron				
T= tolerant at labeled rates					MSMA				
I = Intermediate safety					pronamide				
NR = Not recommended/labeled – severe injury potential					rimsulfuron				
D = Dormant					sethoxydim				
					sulfentrazone				
					sulfosulfuron				
					triclopyr + clopyralid				
					trifoxylfuron				
					thiencazone + foramsulfuron +				
					halosulfuron				

LAWN AND TURF WEED MANAGEMENT

GENERAL HOME LAWN WEED CONTROL

Home lawn broadleaf weed control can often be accomplished using selective postemergence formulations that contain two or more herbicides. Formulations are available for most southern grasses. Examples are Bayer Advanced Southern Weed Killer, GreenLight Wipe Out, Trimec Southern, Ferti-lome's Weed Free Zone, Ortho Weed-B-Gon, Atrazine, MSM Turf (metsulfuron). Most labels will stress their use on younger weeds growing in the cooler mid-spring to early summer period. A temporary discoloration of the lawn usually occurs. Repeat application in 3-4 weeks if needed on persistent weeds. **WARNING:** Some of these products contain phenoxy herbicides; avoid drift, keep away from gardens and clean sprayers thoroughly with ammonia. Atrazine-containing products enter through roots and leaves and work more slowly. **Note that MSMA is no longer available for home lawn use; however, existing quantities purchased prior to 2010 with an old label that allows application to home lawns is allowed.**

Many manufacturers offer herbicides impregnated on fertilizer for homeowner use. These products, however, have to be applied according to their intended use. Products containing a preemergence herbicide have to be applied before the weed emerges. For crabgrass, application is typically early March in northern areas of Louisiana and mid-to late February in the southern portion of the state. A good rule of thumb is that *Forsythia plants begin to bloom just prior to crabgrass emergence*. If sufficient rainfall is not received, irrigation should be applied to activate the herbicide. Be sure to read and follow the manufacturer's label for maximum weed control and application instructions. Use a good quality spreader, and make every effort to apply the product uniformly to the lawn. A good practice to ensure uniform application is to apply one-half of the desired amount in one direction across the lawn and the second half of the desired amount perpendicular to the first application.

Virginia buttonweed infesting St. Augustinegrass, centipedegrass, bermudagrass and zoysiagrass lawns:

An herbicide program approach is necessary for managing Virginia buttonweed. Apply "trimec" type products such as Weed B Gon, Weed Free Zone on newly emerged buttonweed starting in mid- to late April when temperatures are less than 85 F. Repeat application within 2 weeks if possible. Once temperatures exceed 85 F, apply metsulfuron or Celsius every 4-6 weeks in lawns with very high buttonweed populations.

The best defense against weeds in a home lawn is to have a dense, healthy turf canopy. Be certain to remove no more than one third of the height of the turf in a single mowing. Maintain St. Augustinegrass at 3 inches. St. Augustinegrass will not tolerate short mowing. Centipedegrass, common bermudagrass and zoysiagrass should be maintained at 1.5 inches tall. Follow a recommended fertility regimen for your specific turf species and location.

LAWN AND TURF WEED MANAGEMENT

LAWNS and OTHER TURF AREAS

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE:			
atrazine @ 1.0-2.0 lb./A	Aatrex and Various other formulations (See labels) @ 1.0-2.0 qt./A or 0.75-1.5 fl oz/1000 sq. ft.	<i>Poa</i> , winter annuals such as henbit, chickweeds and lawn burweed.	Restricted use. Use only 1 qt./A per application. Safely applied to St. Augustine, centipede, zoysiagrass and dormant bermudagrass late fall or early winter. Do not use in overseed areas. Do not apply near drip-line of trees and shrubs.
benefin @ 2.0 – 3.0 lb./A	Balan 2.5 G @ 120 lb./A or 2.75 lb./1,000 sq. ft.	Crabgrass, goosegrass, <i>Poa annua</i> (annual bluegrass) and certain other annuals	Apply in late Feb. to early March in south La. and early to mid-March in north La. for many summer annual grasses and broadleaf weeds. Retreat in mid-Sept. in north La. and early to mid-Oct. in south La. for winter annuals. Do not seed treated areas within 4 months of last application. Use on established turf only.
bensulide @ 7.5 - 12.5 lb./A	Bensumec 4 EC @ 1.9 – 3.1 gal./A or 5.6 oz. to 11.2 oz./1,000 sq. ft. Pre-San 7 G @ 107 – 180 lb./A or 2.46 lb to 4.1 lb/1000 sq. ft.	Crabgrass, goosegrass, <i>Poa annua</i> and small seeded broadleaves	Apply in Feb. to early March in south La. and early March in north La. Apply in mid-Sept. in north La. and early Oct. in south La. for <i>Poa</i> . Do not seed treated areas within 4 months of last application. Use on established turf only. Labeled for established bermudagrass greens.
dimethenamid @ 1.0 - 1.5 lb./A	Tower 6 EC @ 21 - 32 oz./A or 0.48 – 0.73 oz./1,000 sq. ft.	Preemergence on most annual grasses, certain broadleaf weeds, doveweed, yellow nutsedge	Most established southern grasses grown in La. Good preemergence control of yellow nutsedge. Apply in Feb. to early March in south La. & early March in north La. Apply in mid-Sept. in north La. & early Oct. in south La. for <i>Poa</i> .
dimethenamid + pendimethalin @ 1.75 – 3.5 lb./A	FreeHand @ 100 – 200 lb./A or 2.3 lb. – 4.6 lb./1,000 sq. ft.	Preemergence on most annual grasses, certain broadleaf weeds, doveweed, yellow nutsedge	Most established southern grasses grown in La. Good preemergence control of yellow nutsedge. Apply in Feb. to early March in south La. and early March in north La. Apply in mid-Sept. in north La & early Oct. in south La. for <i>Poa</i> .
dithiopyr @ 0.38 lb./A	Dimension I EC @ 2 qt./A or 1.5 oz./1,000 sq. ft. Dimension Ultra 40 WP @ 0.95 lb./A or 0.35 oz./1000 sq. ft.	Crabgrass, <i>Poa</i> , foxtail, crowfoot, barnyardgrass, goosegrass, small-seeded annual broadleaves	May tank-mix with compatibles. Delay overseeding or sprigging for 3 mos. after application. Provides PRE control of several annual grasses and limited POST control of crabgrass. Apply on established turf only. May be used on all southern turf species.
indaziflam 0.015 – 0.04 lb./A	Specticle 20 WSP @ 1.2 – 3.5 oz./A or 0.028 – 0.080 oz./1,000 sq. ft. Specticle Flo @ 6 – 10 oz/A or 0.14 – 0.23/1000 sq. ft.	Crabgrass, <i>Poa</i> , foxtail, crowfoot, barnyardgrass, goosegrass, several annual broadleaves	Apply prior to weed emergence. Consider split applications approximately 60 days after the initial. Apply on established turf only. May be used on most southern turf species. Do not use on greens.
isoxaben @ 0.5-1.0 lb./A	Gallery 75 DF @ 0.7 – 1.3 lb./A or 0.25-0.5 oz./1,000 sq. ft.	Many broadleaves. No grasses are controlled.	Do not apply through irrigation. Keep in agitation. Can tank-mix with other products. All established turfgrasses are tolerant.

LAWN AND TURF WEED MANAGEMENT

LAWNS and OTHER TURF AREAS

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE continued:			
oxadiazon + bensulide @ 6 + 1.5 lb./A	Goosegrass/Crabgrass Control @ 6.56 G @ 116 lb./A or 2.6 lb./1,000 sq. ft.	Crabgrass, goosegrass, <i>Poa annua</i>	Apply on established zoysiagrass, perennial ryegrass and bermudagrass. May be applied to established greens and tee boxes.
prodiamine @ 0.75 - 1 lb./A	Barricade 65 WG @ 0.75 – 1.5 lb./A or 0.28 - 0.4 oz./1,000 sq. ft. Barricade 4L @ 0.625 – 3 pt/A or 0.23 – 1.1 oz/1000 sq. ft.	Crabgrass, <i>Poa annua</i> , foxtail, crowfootgrass, barnyardgrass, goosegrass, small-seeded annual broadleaves	On established turf, including ryegrass. Long residual. Use caution if winter kill of existing turf is suspected. All southern grasses are tolerant. Split applications for goosegrass.
pronamide @ 0.5 lb./A	Kerb 50W @ 1 lb./A or 0.37 oz./1,000 sq. ft.	Pre- or early post- in fall or winter for control of <i>Poa annua</i>	May be applied to established greens and tee boxes. Use on dormant or active bermudagrass for <i>Poa</i> . Ryegrass overseed, fescues and bentgrass will be injured. Acts mainly through root absorption. Beware of runoff onto sensitive grasses. Do not use within 70 days prior to overseeding. Postemergence activity is slow (1-2 mos). Restricted use.
pendimethalin @ 1.7 – 3.0 lb./A	Pendulum 3.3 EC @ 3.6–4.8 pt./A or 1.3–1.8 oz./1,000 sq. ft. Pendulum AquaCap 3.8 @ 3.1 – 6.2 pt./A or 1.15 oz. – 2.3 oz./1,000 sq. ft. Pendulum 2G @ 75–150 lb./A or 1.7 – 3.4 lb./1,000 sq. ft.	Goosegrass, crabgrass, small-seeded broadleaves	For established warm-season grasses. Not for spring use when turf suffers from severe winter kills. Irrigate after application. All southern grasses are tolerant.
metolachlor @ 1.2 – 2.6 lb./A	Pennant Magnum 7.62 EC @1.3 - 2.6 pt./A or 0.48-0.96 oz./1,000 sq. ft.	<i>Poa</i> , goosegrass, crabgrass, yellow nutsedge, some annual sedges, small-seeded broadleaves	For warm season turfs. Not for tees or greens. Do not overseed 4 months prior or 6 months after. Also for ornamentals.
sulfentrazone + prodiamine	Echelon 4 SC @ 0.5 – 2.25 pt./A or 0.184 – 0.826 oz/1,000 sq. ft.	Annual grasses, annual sedges, yellow nutsedge, certain broadleaf weeds	Apply safely to bermudagrass, centipedegrass, zoysiagrass and seashore paspalum after the second mowing. Do not apply on St. Augustinegrass.
oxadiazon @ 2.0-4.0 lb./A	Ronstar 2 G @ 100 – 200 lb./A or 2.3 – 4.6 lb./1,000 sq. ft. Regal Ronstar 2 G @ 100 – 200 lb/A or 2.3 – 4.6 lb/1000 sq. ft. Ronstar 50 WP@ 4 – 6 lb/A or 1.5 – 2.2 oz/1000 sq. ft.	<i>Poa annua</i> , crabgrass, goosegrass, oxalis, many other annual grasses and broadleaf weeds	For use on established St. Augustine, Zoysia and bermudagrass only. Do not exceed 150 lb./A (3 lb. active) on St. Augustine turf. May cause temporary discoloration. Do not apply to centipedegrass or bermudagrass golf greens. Can split applications 30 days apart. 50WP for dormant turf. Apply 50 WP several weeks prior to greenup. Commercial turf only.

LAWN AND TURF WEED MANAGEMENT

LAWNS and OTHER TURF AREAS

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE continued:			
fenarimol @ 1.4 - 2.0 lb./A	Rubigan 50WSP @ 44 – 65 oz./A or 1 – 1.5 oz./1,000 sq. ft.; repeat in 10-14 days.	<i>Poa annua</i>	Apply to greens and tees prior to overseeding in 2-3 applications. Final application should be made 2 weeks prior to overseed. Acts by reducing <i>Poa annua</i> growth to allow overseed to dominate on Bermuda greens. Rubigan is an effective, locally systemic, broad spectrum fungicide for dollarspot and brown patch. Single, double or triple split application. Single applications provide poor <i>Poa annua</i> control.
oryzalin @ 3.0 lb./A	Surflan 4 AS @ 3 qt./A or 2.2 oz./1,000 sq. ft.	Crabgrass, rye, goosegrass, barnyard grasses, foxtails and <i>Poa annua</i> as well as many broadleaves	Not for greens or tees. Delay reseeding 3-4 mos. Safe for all established warm-season grasses.
simazine @ 1 – 2 lb./A	Simazine 4 L @ 1 – 2 qt./A or 0.75 – 1.5 oz./1,000 sq. ft.	Provides excellent control of <i>Poa annua</i> as well as many winter broadleaves	Safely applied to St. Augustine, centipede, zoysiagrass and bermudagrass late fall or early winter. Do not use in overseeded areas. May be applied Sept. 1 to June 1.
SELECTIVE POSTEMERGENCE:			
atrazine @ 1.0-2.0 lb./A	Aatrex and Various other formulations (See labels) @ 1.0 – 2.0 qt./A or 0.75 – 1.5 fl oz./1,000 sq. ft.	Florida betony, <i>Poa</i> , dollarweed, lespedeza, henbit, lawn burweed	Restricted use. Do not apply more than 1 qt./A per application. Safely applied to St. Augustine, centipede, zoysiagrass and dormant bermudagrass in early winter for several winter weeds. Do not use in overseed areas. Do not apply near drip-line of trees and shrubs.
simazine @ 1 – 2 lb./A	Simazine 4 L @ 1 – 2 qt./A or 0.75 – 1.5 oz./1,000 sq. ft.	Good post control of <i>Poa annua</i> and many winter broadleaves	Safely applied to St. Augustine, centipede, zoysiagrass and bermudagrass late fall or early winter. Do not use in overseeded areas. Apply after last home game on non-overseeded football fields.
fenoxaprop @ 0.57 – 0.174 lb./A	Acclaim 0.57 EC @ 13 – 39 fl. oz./A or 0.75 – 1 fl. oz./1,000 sq. ft.	Early postemergence: several annual grasses and bermudagrass suppression.	Can be safely applied to zoysiagrass. Suppresses bermudagrass infesting zoysiagrass.
asulam @ 1.7– 2.1 lb./A	Asulox 3.3 EC @ 4 – 5 pt./A or 1.5 – 1.8 oz./1,000 sq. ft.	Crabgrass, goosegrass, sandbur	Postemergence: use in Tifway 419 bermuda and St. Augustinegrass sod. Do not apply to residential turf. Do not apply to freshly mowed or stressed turf. Do not use surfactant. One application per season. Some discoloration may occur, especially in hot weather.

LAWN AND TURF WEED MANAGEMENT

LAWNS and OTHER TURF AREAS

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
SELECTIVE POSTEMERGENCE continued:			
dicamba @ 0.25 – 0.5 lb./A	Banvel 4S @ 0.5 – 1 pt./A or 1-2 tsp./1,000 sq. ft.	Annual and biennial broadleaves, woody brush and vines. Chickweed, white clover, henbit, burweed, wild strawberry, curly dock, spotted spurge	Use on deep-rooted, stubborn broadleaves. Apply sufficient gallons to coat foliage down to base of plant. Repeat application may be needed. Do not exceed 0.5 lb. per acre per year. Applications over 0.25 lb./A may temporarily stunt and discolor some grasses. Apply no more than 0.5 pt./A to St. Augustinegrass. May be tank-mixed with 2,4-D, MCP, MCPA (consult label).
bentazon @ 1.0 – 2.0 lb./A	Basagran T/O or Lescogran 4 SL 1 – 2 qt./A or 0.75-1.5 oz./1,000 sq. ft.	Yellow nutsedge and annual sedges; green kyllinga with repeat applications	Use on established warm-season grasses turf. Can repeat at 10-14 days. Do not apply more than 3 qt./A/season. Do not mow 3-5 days before or after application. May add crop oil concentrate.
sulfosulfuron @ 0.05 – .09 lb./A	Certainty 75 WG @ 1.25 – 2.0 oz./A or 0.03 – 0.04 oz./1,000 sq. ft.	Yellow and purple nutsedge, green kyllinga, johnsongrass	Safe on all warm-season turfgrasses and very effective on most sedges including green kyllinga also controls johnsongrass.
ethofumesate @ 1.0 – 2.0 lb./A	Prograss 1.5 F @ 1.0 – 2.0 gal./A or 3 – 6 oz./1,000 sq. ft. on lt soil 3.5 – 4 oz./1,000 sq. ft. on med-hvy soil	Annual grasses (<i>Poa annua</i>), pigweed, chickweed, purslane, barnyardgrass, crabgrass, foxtail; suppresses nutsedge	Apply pre- or early postemerge. Hastens or extends dormancy in bermudagrass. Therefore, apply 3-4 wks after overseeding. Do not overlap. Repeat once for extended control. Overseed only with perennial ryegrass. Maximum 8 pt./A/season. Seasonal influences on bermudagrass recovery can be significant for Baton Rouge and southward.
dicamba diglycolamine @ 0.09 – 1 lb./A	Clarity @ 3 – 32 oz./A or 0.07 – 0.74 oz./1,000 sq. ft.	Same weeds controlled with Banvel	After green-up. To avoid injury to newly emerged grasses, wait until after the second mowing to apply. Applications of more than 16 oz./A may discolor susceptible grasses. Consult label. Do not exceed 32 oz./A/yr. See recommendations for sensitive grasses.
triclopyr plus clopyralid @ 0.09 – 0.19 lb./A.	Confront 3 SL @ 1.5-2.0 pt./A or 0.5-0.75 oz./1,000 sq. ft. or pump-up sprayer @ 1 tbsp./gal. for spot treatments	Many annual and perennial Broadleaves; black medic, white clover, chickweed, burweed, lespedeza, wild violet, Virginia buttonweed	Postemerge on active weeds. Repeat if necessary. May be used on bermudagrass, centipedegrass and zoysiagrass. Do not apply on St. Augustinegrass. Avoid drift and contact of shrubs. Not for golf greens or tees. A maximum 2 qt./A/yr. Do not apply to residential turf.
quinclorac @ 0.75/A	Drive 75 DF 1 lb./A or 0.367 oz./1,000 sq. ft.	Crabgrass, barnyardgrass, lespedeza, clover; suppression of torpedograss	For bermudagrass and zoysiagrass. Do not apply to centipede, St. Augustine or bahiagrass. Three applications needed for torpedograss management.
quinclorac, sulfentrazone, dicamba, 2,4-D @ 1.1 – 1.6 lb./A	Drive XLR 8 @ 64 oz/A or 1.45 oz/1000 ft ² Q4 Plus @ 5 – 7 pt./A or 1.8 – 2.6 oz./1,000 ft ²	Crabgrass, barnyardgrass, broadleaf signalgrass, foxtail, lespedeza, clover, Florida betony, yellow nutsedge	Warm-season application is limited to bermudagrass. Reduced crabgrass control at 3 to 4 tillers. Apply at least 2 days before mowing or 2 days after. Do not apply to centipedegrass or St. Augustinegrass.

LAWN AND TURF WEED MANAGEMENT

LAWNS and OTHER TURF AREAS

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
SELECTIVE POSTEMERGENCE continued:			
diclofop @ 0.75 – 1.5 lb./A	Illoxan 3EC @ 32 – 44 oz./A 0.75 – 1.0 oz./1,000 sq. ft.	Goosegrass infesting bermudagrass on golf courses including greens	Postemergence control of goosegrass up to 1 tiller. Apply on established bermudagrass. Do not tank-mix with fertilizers or other pesticides. Do not overseed treated area for at least 2 months following application. Avoid mowing treated areas for 36 hours. Restricted use.
imazaquin @ 0.38 – 0.5 lb./A	Image 70 DG @ 8.6 – 11.4 oz. or 0.2 – 0.26 oz./1,000 sq. ft.	Chickweed, henbit, geranium, pigweed, onions, purple nutsedge, burweed, sandbur; suppression of kyllinga and dollarweed	Can be used on all warm-season grasses. However, do not apply to dormant or transitional St. Augustinegrass. Do not tank-mix with other postemergence herbicides. Not for cool-season grasses or golf greens. Some yellowing may occur especially in tire tracks or low areas. Repeat for improved control.
clopyralid @ 0.09 – 0.5 lb./A	Lontrel 3 EC @ 0.25 – 1.33 pt./A 0.1 – 0.5 oz./1,000 sq. ft.	Broadleaf weeds, including legumes and buttonweed	Safely applied to all warm-season grasses. Do not use on putting greens or tees. No surfactant is needed. Can provide effective control of Virginia buttonweed but repeated applications may be necessary. Avoid drift to susceptible ornamental plants. Do not apply to residential turf.
metsulfuron @ 0.01 – 0.038 lb./A	Various trade names including: Blade, Manor, Mansion, MSM etc. 60 WDG @ 0.33 – 1 oz./A or 0.007 – 0.023 oz./1,000 sq. ft.	Pensacola bahiagrass, clovers, rose (pink) woodsorrel, many winter Broadleaves; suppression of buttonweed with 2 applications sprayed 6 weeks apart	Controls a wide range of broadleaf weeds. Labeled for St. Augustinegrass, bermudagrass, zoysiagrass, centipedegrass. Do not exceed 0.5 oz./A on centipedegrass. Do not overseed for 8 weeks after application.
MSMA @ 2.0 – 3.0 lb./A	MSMA 6 SL @ 1.3 – 2 qt./A or 1.0 – 1.5 oz./1,000 sq. ft. MSMA 6.6 SL @ 1.2 – 1.8 qt./A or 1.0 – 1.3 oz./1,000 sq. ft.	Bahiagrass, crabgrass, dallisgrass, nutsedges	Bermudagrass and zoysiagrass are tolerant. A 6 lb./gal. formulation has surfactant, but 6.6 lb./gal. formulation does not. Best performance can be expected when air temperatures are at least 80 F. Repeat applications are required 7-10 days apart. Dallisgrass control requires multiple applications. Emerald zoysiagrass is susceptible to MSMA. See new application restrictions on label.
halosulfuron @ 0.03 – 0.06 lb./A	Sedgehammer 75 WDG @ 0.6 – 1.33 oz./A or 0.138 – 0.03 oz./1,000 sq. ft. or 0.25 tsp./gal. spot	Nutsedges (purple & yellow); suppression of kyllinga species	Postemergence with repeat application necessary within 6 weeks with heavy infestations. Use non-ionic surfactant. Can be used on all warm-season grasses.
chlorosulfuron @ 0.05 – 0.25 lb./A	Corsair 75 WDG @ 1 – 5.33 oz./A or 0.02 – 0.122 oz./1,000 sq. ft.	Va. buttonweed suppression with 2 applications spaced 6 weeks apart; white clover, wild garlic	Some discoloration and delayed greenup in St. Augustinegrass. Good activity on most broadleaf weeds.

LAWN AND TURF WEED MANAGEMENT

LAWNS and OTHER TURF AREAS

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
SELECTIVE POSTEMERGENCE continued:			
trifloxysulfuron @ 0.015 – 0.02 lb./A	Monument 75 WG @ 0.33 – 0.56 oz./A or 0.007 – 0.011 oz./1,000 sq. ft. Spot treatment @ 0.0176 oz./gallon + 2 teaspoons of non-ionic surfactant.	Purple, yellow, annual sedges; green kyllinga, oxalis, white clover, spotted spurge, <i>Poa</i> , ryegrass overseed, Virginia buttonweed	Bermudagrass and zoysiagrass only. Excellent sedge and green kyllinga control. Suppresses Virginia buttonweed. Repeat applications may be needed 4 wks after initial application for buttonweed. Use rates 0.1 – 0.3 oz./A for overseed removal. Allow 6 wks between last application and overseeding with ryegrasses. May be applied on bermudagrass golf greens.
rimsulfuron @ 0.031– 0.062 lb./A	TranXit GTA and generics 25 DF @ 1 – 2 oz./A or 0.046 – 0.09 oz./1000 sq. ft.	<i>Poa annua</i> , perennial ryegrass overseed	<i>Poa annua</i> control in non-overseeded bermudagrass. Transitional aid for the removal of ryegrass overseed. May be used on established bermudagrass golf greens and tees.
iodosulfuron + thiencazone + dicamba @ 0.10 – 0.21 lb./A	Celsius 68 WG @ 2.5 – 4.9 oz./A or 0.057 – 0.113 oz./1,000 sq. ft.	Broadleaf weeds such as white clover, chickweed, buttonweed; suppression of dallisgrass with sequential applications or applied as spot	Excellent safety on most lawn grasses grown in La. except carpetgrass. Good safety on St. Augustinegrass in hot weather. Do not apply to a turf overseeded with cool-season grasses such as perennial ryegrass. Do not apply to carpetgrass.
thiencazone + foramsulfuron+halosulfuron @ 0.037 – 0.121 lb./A	Tribute Total 60.5 WDG @ 1.0 – 3.2 oz./A or 0.02 – 0.07 oz./1000 sq. ft.	Several grassy and broadleaf weeds including ryegrass, <i>Poa</i> , clovers, buttonweed; suppression of dallisgrass	Bermudagrass only. Use a non-ionic surfactant. Provides good suppression of dallisgrass when applied in 2 applications in late summer to early fall @ 3.2 oz./A per application. Can be helpful in the management of buttonweed.
flazasulfuron @ 0.012 – 0.047 lb./A	Katana 25 DF @ 0.75 – 3.0 oz./A or 0.0172 – 0.068 oz./1000 ft ²	Effective removal of perennial ryegrass and <i>Poa trivialis</i> overseed; also controls annual bluegrass, blue-eyed grass and newly emerged crabgrass.	Bermudagrass or zoysiagrass with some limited low rate use in centipede grass. Do not apply on golf greens.
metribuzin @ 0.2 – 0.5 lb./A	Sencor 75 DF @ 5.3-10.5 oz./A or 0.12 – 0.24 oz./1,000 sq. ft.	Chickweed, henbit, burweed, Speedwell, goosegrass when tankmixed with MSMA	Postemergence on dormant bermudagrass turf (use higher rates). Actively growing turf (mid-spring) bermudagrass only. Do not apply on golf greens, tees or aprons. Delay mowing for at least 3 days before spray. Do not exceed 1.5 lb./A/season or more than 1 application on dormant or 2 applications on active turf. Mix with MSMA at 0.1 – 0.2 lb./A for goosegrass control.
2,4-D + MCPP + dicamba @ 0.68 – 1.35 lb./A	Trimec Classic 2.7 EC @ 2 – 4 pt./A (consult label for other turf) or 0.75 – 1.5 oz./1,000 sq. ft. for hybrid Bermuda and 1 oz./1,000 sq. ft. for St. Augustinegrass or centipede grass	Virginia buttonweed, Henbit, lespedeza, clovers, dandelion, dock, burweed, bull thistle, wild strawberry and many other broadleaves	Consult label for specific turf rates. Provides good control of many broadleaf weeds. Avoid nontarget drift. For clover, 4 pt./A is recommended. Maximum of 2 applications per year. Do not apply when temperatures exceed 85 F.

LAWN AND TURF WEED MANAGEMENT

LAWNS and OTHER TURF AREAS

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
SELECTIVE POSTEMERGENCE continued:			
2,4-D + MCPP + dicamba @ 0.375 – 0.75 lb./A	Trimec Southern 3 EC @ 1 – 2 pt./A or 0.37 – 1 oz./1,000 sq. ft. (consult label for specific turf)	Henbit, lespedeza, clovers, dandelion, dock, lawn burweed, bull thistle, wild strawberry and many other broadleaves	May be applied to most southern turf. However, use rates vary for particular grass species. Use 1.5 pt./A in St. Augustinegrass. Contains less 2,4-D than Trimec Classic. Do not apply when temperatures exceed 90 F.
2,4-D + MCPP + dicamba + carfentrazone @ 0.1519 – 0.6075 lb./A	Speed Zone South 2.2 EC @ 1.5 – 6 pt./A or 0.55 – 2.2 oz./1,000 sq. ft. for hybrid Bermuda 1 oz./1,000 sq. ft. for St. Augustinegrass or centipedegrass	Virginia buttonweed, Henbit, lespedeza, clovers, dandelion, dock, lawn burweed, bull thistle, wild strawberry and many other broadleaves	May be used in most warm-season turfgrass. Consult label for specific turf rates. Provides good control of many broadleaf weeds. Avoid nontarget drift. Do not apply when temperatures exceed 85 F.
2,4-D amine @ 0.75 – 1 lb./A	2,4-D amine 3.84 EC @ 1.5 – 2.0 pt./A or 1.0 oz. or 2 tbsp./2 gal. water/1,000 sq. ft. Spot treatments @ 0.5 oz/gallon/1000 sq. ft in St.	Many annual, biennial and perennial broadleaf weeds.	St. Augustinegrass is the most sensitive warm-season turf. Use spot treatments instead of broadcast. Apply on sunny days when the temperature is well above 60 F and there is little wind presence. Observe regional rules concerning 2,4-D use in cotton-producing areas of the state.
sethoxydim @ 0.28/A	Segment 1 EC @ 2.25 pt./A or 0.83 fl oz./1,000 sq. ft.	Crabgrass, goosegrass; other annual grasses; temporary suppression of torpedograss; poor control of carpetgrass	Postemergence on grassy weeds in centipede. May be used on seedling centipedegrass (delay application until 3 in. of new stolon growth) and established centipedegrass. Apply at 1.5 pt./A rate for seedling centipedegrass. Ensure good coverage of target foliage. Use during good growing conditions. If centipede is cold-stressed, delay application until 3 weeks after green up. A maximum 2 applications/year on established centipede. Only suppresses torpedograss. For bahiagrass suppression, reapply 10 – 14 days after first application. Some limited torpedograss suppression with 2 applications spaced 3 weeks apart.
NONSELECTIVE POSTEMERGENCE:			
cacodylic acid @ 8 lb./A	Phytar 560 2.48 EC @ 12 TBL in 3 gal. water for 816 sq. ft.	Most annual vegetation contacted	REFER TO LABEL FOR COMPLETE INSTRUCTIONS. A nonselective contact herbicide to control top growth of weeds. Similar to paraquat in activity. One tablespoon of surfactant/3 gal. water is usually beneficial for spot treatments.
dazomet @346.5 lb./A	Basamid 99 G @ 350 lb./A or 8 lb./1,000 sq. ft.	Soil treatment that kills most weeds prior to planting.	Follow label carefully. Apply prior to planting. Fall for early spring planting. Soil fumigant used 2-4 weeks ahead of planting depending on soil temperature. Toxic to fish.

LAWN AND TURF WEED MANAGEMENT**LAWNS and OTHER TURF AREAS**

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
NONSELECTIVE POSTEMERGENCE continued:			
diquat 0.25 – 0.5 lb./A	Reward 2 SL @ 1 – 2 pt./A 0.4 – 4.4 fl oz./1,000 sq. ft.	Most annual weeds	Use on dormant bermudagrass and for edging. Top burn kill; same as paraquat. Presently a 24C label. Add a non-ionic surfactant, if advised. Not effective on perennial weeds.
	Various other formulations		
glufosinate – ammonium @ 0.75 – 1.5 lb./A	Finale I SL @ 3 – 6 qt./A or spot treatment 1.5 – 4.0 oz./gal.	Most weeds, including Asian jasmine	Nonselective burndown like paraquat. Locally systemic. Many tank-mix combinations. Use 20 – 40 g/A for sufficient coverage.
glyphosate ¹ @ 1.0-5.0 lb.	Roundup Pro 4 SL and others @ 1– 1.5 qt./A for annuals or 2.5 – 5 qt./A for perennials and turf renovation 0.75 – 3 oz./1,000 sq. ft. or Spot treatments @ 1 – 2% solution	Most grasses and herbaceous broadleaves	This nonselective herbicide is systemic. Spray foliage to wet. Leaves should have no heavy dust cover. Use when no rain is expected for at least 6 hours. Plants should not be stressed. Use when target vegetation is actively growing. For turf renovation, wait 7-10 days before cultivating. Not for use on dormant St. Augustine, Centipede or Carpetgrass.

¹ See “Appendix A” for glyphosate products and their surfactant requirements.

FRUIT CROPS WEED MANAGEMENT

STRAWBERRY Directed

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
FALLOW BED:			
oxyfluorfen @ 0.25-0.50 lb./A	Goal 1.6E @ 1.25-2.5 pt./Ainches	Winter annual broadleaf weeds such as Carolina geranium and evening primrose	Apply to fallow beds. May retreat on 30-day intervals up to planting. Apply to clean, smooth, established beds. Rainfall (0.25 inch) is necessary to activate chemical.
PREEMERGENCE:			
simazine @ 1-2 lb./A	Princep 4L @ 1-2 qt/A	Annual bluegrass, large crabgrass, henbit, evening-primrose, chickweed, other weeds listed on the label	Apply to furrows between raised beds covered with plastic mulch in a min. of 20 gal. of water/acre after transplanting when the furrows are firm, free of standing water and prior to weed emergence. (Section 24C label).
napropamide @ 4.0 lb./A	Devrinol 50DF @ 8.0 lb/A Devrinol 2 EC @ 2 gal/A	Annual grasses, broadleaf weeds	Apply after planting or to established beds before weeds emerge. Mechanically incorporate or irrigate into the soil to a depth of 1-2 inches within 24 hr. of application. Do not apply from bloom through harvest. Do not exceed a maximum application rate of 8 lb. per acre per crop cycle.
flumioxazin @ 0.1lb./A	Chateau WDG and SW @3 oz/A	Broadleaf weeds	Apply to row middles with a hooded sprayer for preemergence control for broadleaf weeds before weeds emerge. Do not apply after fruit set. Do not allow spray or spray drift to come in contact with the fruit foliage. Crop spotting may occur if an adjuvant is added. Application after fruit set may result in spotting of fruit and should be avoided. Do not make more than one application per growing season.
pendimethalin @ 0.72 1.44 lb./A	Prowl H ₂ O@ 1.5 -3.0 pt./A Coarse soil 1.5 pt./A Medium soils 2.0 to 2.5pt./A Fine soils 2.5 to 3.0 pt./A	Broadleaf weeds, annual grasses	Apply to row middles. Do not apply within 35 day of harvest. DO NOT apply more than 3.0 pt. per acre per application. DO NOT apply more than 6.0 pt. per acre per season. Do not feed forage or graze livestock in treated fields.
POSTEMERGENCE:			
sethoxydim @ 0.28-0.47 lb./A	oast @ 1.5-2.5 pt./A Apply with COC @ 2 pt./A Pump up sprayer: .3-2 oz/gal Poast + 1.3 oz/gal COC	Perennial and annual grasses	Apply to actively growing grasses before they exceed labeled heights. Bearing and nonbearing. Use flat fan nozzle tips. Do not apply within 7 days of harvest. Do not exceed 2.5 pt. of Poast per season.
clethodim @ 0.1-0.125 lb./A	Select @ 6-8oz/A Apply with COC @ 2 pt./A Pump up sprayer: 0.33-0.66 oz/gal Select + 1.3 oz/gal COC)	Annual and perennial grasses, annual bluegrass	Apply at postemergence to actively growing grasses. Do not apply under stressed conditions or if rainfall is expected within 4 days of harvest. Do not apply more than 8 oz./A in a single application. For repeat applications make at a minimum of 14-day intervals.

FRUIT CROPS WEED MANAGEMENT

STRAWBERRY

Directed

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
DIRECTED POSTEMERGENCE:			
simazine @ 1-2 lb./A + paraquat @ 0.49 lb./A	Princep 4L @ 1-2 qt/A + Gramoxone SL @ 2 pt./A Apply with NIS @ 1-2 pt./100 gal	Weeds controlled by Princep 4L plus those controlled by Gramoxone SL	Apply between beds covered with plastic mulch as a directed spray in 20 GPA. Apply after transplanting when furrows are firm and free of standing water. See comments above for paraquat and simazine.
carfentrazone @ 0.008-0.025/A	Aim 2EC @ 0.5-.6 oz Apply with COC @ 1 gal/100 gal or NIS @ 2 pt./100 gal.	Postemergent control of broadleaf weeds	May be applied as a preplant burndown treatment and/or as a postdirected spray on row middles. May be tank- mixed with other registered herbicides.
paraquat @ 0.49 lb./A	Gramoxone SL @ 32 oz/A Apply with NIS @ 1 pt./100 gal Pump up sprayer: 0.5 oz/gal Gramoxone + 0.5 oz/gal NIS	Annual broadleaf and grasses; suppression of perennials in the interspaces and around base of bushes or vines	Apply in a minimum of 20 gal. water/A as a directed spray between rows. Use shields to avoid injury. Do not apply within 21 days of harvest. Do not apply more than 3 times per season. Do not allow spray to contact plants.

FRUIT CROPS WEED MANAGEMENT

BLACKBERRY: Erect and Trailing Blackberry (Dewberry)

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE:			
simazine @ 2-4 lb./A	Simazine 4L, Princep @ 2-4 qt/A Simazine 90DF, Princep 90, Caliper @ 2.2-4.4 lb./A	Annual weeds and grasses	Apply as preemergence spring application or as split applications once in spring and once in fall. On plants less than 6 months old, use one-half rate. Do not apply when fruit is present or illegal residues may result. Do not contact fruit, foliage or stems. Use minimum of 40 gal. of water per acre.
oryzalin @ 2-6 lb./A	Surflan A.S. @ 2.0-6.0 qt/A Oryzalin 4 A.S. @2.0-6.0 qt/A	Annual grasses, certain annual broadleaf weeds	Apply before annual weeds emerge. Can be applied to new plantings after soil has settled and no cracks are present. Use low rate for short-term control (2-4 months); high rate for long-term control (6-8 months). Apply in strip in plant rows; do not apply to row middles or drive rows.
norflurazon @ 2.0–3.9 lb./A	Solicam DF @ 2.5-5.0 lb/A	Annual grasses, broadleaf weeds	Apply prior to weed seed germination and rainfall or irrigation is likely within 4 weeks of application. Apply postharvest in the fall or early spring. Delay application to newly established vines until 18 months after planting if west of the Mississippi River, and 6 months if east of the river. The soil should be settled, firm and relatively free of weeds and debris at the time of application. Do not apply within 60 days of harvest. Use the low rate on coarse-textured soils, high rate on fine-textured soils. Make one application per year. Solicam may result in temporary bleaching or chlorosis of the leaves from which the plant will recover. DO NOT graze treated areas.
napropamide @ 4.0 lb./A	Devrinol 50DF @ 8.0 lb/A Devrinol 2 EC @ 2 gal/A	Annual grasses and broadleaf weeds	Apply to a weed free soil surface. May be applied to newly planted or to established crop. Do not exceed a maximum application rate of 8 lb. per acre per crop cycle.
POSTMERGENCE:			
fluazifop @ 0.25-0.37 lb./A	Fusilade DX @ 16-24 fl oz/A Add COC or NIS; see label	Perennial and annual grasses	Apply at postemergence to NONBEARING plants that will not be harvested within 1 year. DO NOT contact foliage. Perennial grasses may require sequential applications for adequate control. Does not control nutsedge. Fusilade DX herbicide is rainfast 1 hour after application.
sethoxydim @ 0.3-0.5 lb/A	Poast @ 1.5-2.5 pt./A Add COC or NIS; see label	Perennial and annual grasses	Apply at postemergence. Do not apply within 30 days of harvest.

FRUIT CROPS WEED MANAGEMENT

BLACKBERRY: Erect and Trailing Blackberry (Dewberry)

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE continued:			
clethodim @ 0.07-0.12 lb/A	Select Max @9-16 fl. oz./A	Annual and perennial grass weeds	Apply as a directed spray to the base of the canes. Select Max can be applied to bearing and nonbearing plants; however, Arrow and Select can only be applied to nonbearing plants. Include a non-ionic surfactant at 0.25% v/v. The PHI for Select Max is 7 days.
DIRECTED POSTEMERGENCE:			
paraquat @ 0.5-1.0 lb/A	Gramoxone SL @ 2-4 pt./A Firestorm 3SL @1.3-4 pt./A Apply with approved adjuvant; see label.	Annual weeds and grasses; top kill and suppression of perennials in the interspaces and around base of bushes or vines	Apply at postemergence as a coarse directed spray to avoid injury. Apply before emergence of new canes or shoots. Do not allow spray to contact green bark of canes or foliage. Apply in 50 gal. of water. Maximum number of applications per year is 5.
carfentrazone @ up to 0.1 lb/A	Aim 2EC @ up to 6.4 oz Apply with COC @ 1 gal/100 gal or NIS @ 2 pt./100 gal.	Postdirected application for control of primocanes and broadleaf weeds.	May be applied to the bottom 18 inches of the canes and also to contact the soil out to 24 inches on each side of the plant row as a postdirected spray at intervals of 14-21 days. Apply when primocanes are 6 inches high using the maximum rate in a minimum of 20 gal. of water. Most sensitive annual weeds can be controlled using a 1- to 2-oz. rate.

FRUIT CROPS WEED MANAGEMENT

BLUEBERRY

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE:			
simazine @ 2-4 lb./A	Simazine 4L, Princep @ 2-4 qt/A	Annual weeds and grasses	Make single application in spring before bud break and before weed emergence or split applications once in spring and once in fall. On plants less than 6 months old use one-half rate.
	Simazine 90DF, Princep 90, Caliper @ 2.2-4.4 lb./A		
norflurazon @ 2.0-3.9 lb./A	Solicam DF @ 2.5-5.0 lb./A	Annual grasses, broadleaf weeds	Apply in fall or early spring prior to weed emergence. Delay applications until 6 months after planting. Avoid contact of fruit or and foliage. Rainfall or irrigation is required within 4 weeks of application. Do not apply within 60 days of harvest.
oryzalin @ 2-6 lb./A	Surflan A.S. @ 2-6 qt./A Oryzalin 4 A.S. @2-6 qt./A	Annual grasses, broadleaf weeds	Apply at preemergence. DO NOT apply to newly established plants until soil has settled. Apply before annual weeds emerge.
flumioxazin @ 0.188-0.38 lb/A	Chateau SW @6-12 oz./A	Broadleaf and grass weeds	Do not apply to blueberries established less than 2 years. Do not allow spray or spray drift to come in contact with the fruit foliage. Crop spotting may occur if an adjuvant is added. Application after fruit set may result in spotting of fruit and should be avoided. Do not apply within 7 days of harvest.
diuron @ 1.6-2.2 lb./A	Diuron 4L @ 1.2-1.6 qt/A Karmex DF, Diuron DF @ 1.5-2.0 lb/A	Annual weeds	Use only where blueberries have been established for at least 1 year. Apply as directed spray to the base of the bush, avoiding contact of fruit and foliage with spray. Apply in late fall or early spring before weeds have emerged. Do not use on sand, loamy sand, gravelly soils or exposed subsoils.
napropamide @ 4.0 lb./A	Devrinol 50DF @ 8.0 lb/A Devrinol 2 EC @ 2 gal/A	Annual grasses, broadleaf weeds	Apply to a weed-free soil surface. May be applied to newly planted or to established crop. Do not exceed a maximum application rate of 8 lb. per acre per crop cycle.
POSTEMERGENCE:			
fluzifop @ 0.25-0.37 lb./A	Fusilade DX @ 16-24 fl oz/A	Perennial and annual grasses	Apply at postemergence. Apply to NONBEARING bushes only that will not be harvested within one year. Direct spray. DO NOT contact foliage. Always use a crop oil concentrate or a non-ionic surfactant. Broadleaf weeds and nutsedge will not be controlled.
sethoxydim @ 0.28-0.47 lb/A	Poast @ 1.5-2.5 pt./A	Perennial and annual grasses	Apply at postemergence. Apply to bearing or nonbearing bushes. Direct spray. Use flat nozzle tips. Always use a non-phytotoxic oil concentrate. Broadleaf weeds and nutsedge will not be controlled.

FRUIT CROPS WEED MANAGEMENT

BLUEBERRY

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE continued:			
clethodim @ 0.07-0.12 lb/A	Select Max @ 9-16 fl oz./A	Annual and perennial grasses	Apply before grasses exceed height limitations. Always add an adjuvant or crop oil concentrate to the spray application. Refer to label. Apply to bearing and nonbearing plants. Do not apply within 14 days of harvest.
DIRECTED POSTEMERGENCE:			
paraquat @ 0.5 – 1.0 lb/A	Gramoxone SL @ 2–4 pt./A	Annual broadleaf weeds and grasses; top kill and suppression of perennials in the interspaces around base of bushes or vines	Apply as a directed spray before emergence of new canes or shoots. Apply in water at 50 GPA. Add an approved non-ionic surfactant at 1-2 pt./100 gal. spray. Apply as a coarse directed spray to avoid drift injury from the fine spray mist. Maximum number of applications per year is 5.
carfentrazone @ 0.016-0.031 lb/A	Aim 2EC @ 1-2 oz/A Apply with COC @ 1 gal/100 gal or NIS @ 2 pt./100 gal.	Postdirected application for control of susceptible broadleaf weeds	Lower rates may be used to control small seedling weeds at the 2- to 3-leaf stage. Higher rate is needed for larger weeds up to the 6-leaf stage. Applications to weeds beyond the 6-leaf stage may result in only partial control. Carfentrazone may also be applied broadcast to the base of the trunk to control emerged and actively growing weeds during the dormant stage of the crop.
glufosinate-ammonium @ 0.88-1.02 lb/A	Rely 280 @ 48-56 oz/A	Postemergent control of grass and broadleaf weeds	Lower rates may be used to control weeds less than 3 inches tall. Higher rate is needed for larger weeds 3-6 inches tall. Efficacy is reduced when temperatures are cool or when weeds are under drought stress. Do not apply this product within 14 days of berry harvest. Do not graze, harvest and/or feed treated orchard cover crops to livestock.

FRUIT CROPS WEED MANAGEMENT

CITRUS

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE:			
bromacil @ 1.6-4.8 lb./A + diuron @ 1.6-4.8 lb./A	Krovar I DF @ 2-6 lb/A Trees 3 years old and older: 2-4 lb/A on light soil 4-6 lb/A on heavy soil Make two applications (spring & summer) to control perennial weeds: 2 lb./A on coarse soils 3 lb./A on fine soils Use 2-4 lb/A on trees 1-3 years old	Most annual weeds and perennials such as johnsongrass and bermudagrass. Contact activity enhanced by surfactant.	Apply at late winter/early spring, shortly before weeds emerge. Spray on bare ground. Apply with a properly calibrated fixed boom power sprayer as a band or broadcast treatment beneath and/or between trees. Use a minimum of 30 gal/A. Avoid overlapping, and shut off spray boom while starting, turning, slowing or stopping or injury to trees may result. Continuous agitation in the spray tank is required to keep the material in suspension. Best results are obtained if treatment is made to moist soil, or moisture is supplied within 2 weeks after application. Use higher rates for maximum suppression of perennials. NOTE: Avoid contact with fruit and foliage. Temporary yellowing of citrus leaves may occur following treatment. Because injury to citrus trees may result, do not use on soils low in organic matter (less than 1%), poorly drained soils, gravelly soils or thinly covered or exposed subsoils. Do not treat diseased trees such as those with root rot. Do not use in citrus groves interplanted with other trees or desirable plants or in home citrus plantings or in areas where roots of valuable plants or trees may grow into the treated soil.
bromacil @ 1.6-4.6 lb./A	Hyvar X @ 4-5 lb./A on light soils 5-6 lb./A on medium soils 6-8 lb./A on heavy soils Rates are for trees established 4 or more years. If two applications (spring and summer) apply at least 60 days apart at 3-4 lb./A. Use 2/3 lb/A on trees established 1-3 years.	Annual grasses, broadleaf weeds, perennial weeds and sedges	Apply on grapefruit, kumquat, lemon, lime, orange, tangelo, tangerine or satsuma as a single preemergence treatment in late winter/early spring. Apply just before weed growth to bare ground. Two applications required to control perennial weeds. Hyvar is toxic to many trees and plants. Consult label before use. Apply with a properly calibrated fixed-boom sprayer as a band treatment beneath the trees. Use a minimum of 30 gal./A to obtain uniform coverage. Continuous agitation in the spray tank is required to keep the material in suspension. NOTE: Avoid contact with fruit and foliage. Temporary yellowing of citrus leaves may occur following treatment. Because injury to citrus trees may result, do not use on soils low in organic matter (less than 1%), poorly drained soils, gravelly soils or thinly covered or exposed subsoils. Do not treat diseased trees.

FRUIT CROPS WEED MANAGEMENT

CITRUS

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE continued:			
norflurazon @ 2.0–3.9 lb/A	Solicam DF @ 2.5-5.0 lb/A	Annual grasses and broadleaf weeds; suppression of established nutsedge and perennial grasses	Apply as a directed spray to the soil. Avoid contact with fruit or foliage. The soil should be settled, firm and relatively free of weeds and debris at the time of application. Solicam DF will not control emerged weeds. Soil should be free of depressions around trees where rain or irrigation water can concentrate. Solicam DF must be moved into the weed seed germination zone to be effective. If no rainfall occurs within 4 weeks after application, the product must be incorporated by flood or sprinkler irrigation.
pendimethalin	Prowl H ₂ O @ 2.0 to 6.3qts/A Rate 2.0 qts/A Rate 4.0 to 6.3 qts/A	Annual grasses, certain broadleaf weeds	Citrus-bearing trees. Apply Prowl H ₂ O as a broadcast or banded treatment using ground equipment before weed emergence. Apply the spray directly to the ground beneath the trees and/or in areas between rows. Prowl H ₂ O may be applied either in a single application or sequentially with an interval of 30 days or more. Apply Prowl H ₂ O at between 2.0-6.3 qt. per acre depending on the grower's weed control program, level of weed infestation and desired use strategy. Do not to exceed a total of 6.3 qt./A per year in citrus. DO NOT apply within 1 day of harvest of citrus fruit. Spectrum of broadleaf weeds controlled can be increased by tank-mixing with other preemergence chemicals. Tank-mixes with postemergence herbicides should be used to control existing weeds
pendimethalin	Prowl H ₂ O @ 2.0 to 6.3qts/A Rate 2.0qts/A Rate 4.0 to 6.3qts/A Pendimax 3.3, Prowl 3.3 Short-term control (4 months)- 2.4qts/A Long-term control (6 to 8 months) 4.8qts/A	Annual grasses, certain broadleaf weeds No post activity; destroy existing weeds before or during application. May be used in combination with a herbicide registered for use in the specific nonbearing crop to remove existing vegetation.	Nonbearing and newly transplanted trees. Preemergence after planting. Apply the spray in a band directly to the ground under trees. Do not apply to newly transplanted trees or vines until ground has settled and no cracks are present. Preplant surface, prior to transplanting. Uniformly apply in a band or broadcast before planting. Avoid root contact with treated soil when placing transplants into the hole or injury may occur. Preplant Incorporated. Incorporate to a depth of 1-2 inches. Application and incorporation must be made prior to transplanting to avoid mechanical injury to the

FRUIT CROPS WEED MANAGEMENT

CITRUS

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
			<p>crop. Avoid root contact with treated soil when placing transplants into the hole or injury may occur. May be applied either in a single application or sequentially with an interval of 30 days or more.</p> <p>DO NOT apply more than 6.3 qt. of Prowl H₂O per acre per year in citrus. DO NOT apply more than 7.3 qt. of Prowl 3.3 EC per acre per year in citrus. Do not apply to newly seeded nursery stock.</p>
oxyfluorfen @ 1.5 lb./A	Galigan 2E, Goal 2 XL @ 6 pt./A Apply with NIS @ 2 pt./100 gal	Broadleaf weeds	<p>Apply on grapefruit, kumquat, lemon, lime, orange, tangelo, tangerine or satsuma only after foliage has fully hardened off. Nonbearing trees: do not apply during periods of new foliage growth. Use a low pressure sprayer and direct at base of plant. Avoid spray contact on foliage. Use 40 gal. water/A for PRE applications and 40-100 gal. for Post applications. Do not apply more than 16 pt. Goal in one year. Check label for approved tank-mixes with other herbicides.</p>
POSTEMERGENCE:			
paraquat @ 0.64-1.0 lb./A	Gramoxone SL @ 2.5-4 pt./A Apply with NIS @ 1-2pt./100gal or COC @ 1 gal/100 gal Pump up sprayer: 0.5-1 oz./gal. Gramoxone + 0.33 0.66 oz. NIS/gal)	Annual grasses and broadleaf weeds and grasses; top kill and suppression of perennials	Apply to emerged weeds when they are small (1-6 inches tall). Apply in 30 gal. water. Do not allow spray to contact green stems, fruit or foliage because injury may result. Do not spray under windy conditions. Use a shield for young trees. Do not allow animals to graze treated areas. Do not apply this product through any type of irrigation system. Check label for tank-mixes with other herbicides. Maximum number of applications per year is 5.
carfentrazone @ 0.008-0.025/A	Aim 2EC @ 0.5-2.0 oz./A Apply with COC @ 1 gal./100 gal. or NIS @ 2 pt./100 gal.	Broadleaf weeds, bristly mallow	<p>Apply on grapefruit, kumquat, lemon, lime, orange, tangelo, tangerine or satsuma to control broadleaves between rows. Apply to actively growing weeds up to 4 inches tall and rosettes less than 3 inches across. Does not control grasses. Apply with hooded sprayer to protect crop. Extreme caution must be used during applications when desirable fruit and/or foliage are present in order to avoid fruit spotting and/or leaf necrosis. Do not allow spray mist of Aim EC to come in contact with green stem tissue, foliage, blooms or fruit. On seedling or newly transplanted trees do not allow spray to contact green bark of trunk area. Coverage is</p>

FRUIT CROPS WEED MANAGEMENT

CITRUS

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
sethoxydim @ 0.28-0.47/A	Poast 1.5 EC @ 1.5-2.5 pt./A Apply with COC @ 2 pt./A Pump up sprayer: 1.3 oz/gal Poast + 1.3 oz/gal COC	Annual and perennial grasses	essential for satisfactory performance. Can be tank-mixed with other registered herbicides. Do not apply more than 7.9 oz./A/season; 3-day preharvest limit. Apply postemergence on grapefruit, kumquat, lemon, lime, orange, tangelo, tangerine or satsuma. Check label for maximum weed height and rates. Bearing and nonbearing trees, 15 days to harvest. Apply in 10-20 gal. water per acre with 40-60 psi. Direct away from foliage and fruit. A slight leaf speckling or burn can occur.
glyphosate ¹ @ 0.5-5 lb/A	4L formulations: @ 1-3 pt./A on annual weeds 4-10 pt./A on perennial weeds 5.5L formulations: 0.75-2 pt./A on annual weeds 3-7 pt./A on perennial weeds	Most emerged annual and perennial grass and broadleaf weeds	In grapefruit, kumquat, lemon, lime, orange, tangelo, tangerine or satsuma apply to actively growing weeds at the recommended growth stage for each species. Recommended for established groves (See label instructions). Provides top kill plus destruction of roots, rhizomes, etc. Not a residual herbicide. Follow with a label-approved program for effective annual and perennial seasonlong weed control. Spray may come in contact with brown bark area of trunk without injury. Do not spray green bark. Do not allow spray to contact foliage of tree. Avoid contact with root suckers or water sprouts growing at base of tree. Do not mow or till prior to treatment.
fluazifop @ 0.094-0.375 lb./A	Fusilade DX @ 12-24 oz/A Adjuvant required; see label	Perennial and annual grasses	Apply at postemergence to bearing and nonbearing calamondin, citrus hybrids, grapefruit, kumquat, lemon, lime, mandarin (tangerine), orange (all), pummelo and satsuma trees. Use flat fan nozzle; do not contact foliage. Maintain a minimum of 21 days between applications. Do not apply more than 72 fl. oz. of Fusilade DX per acre per season to grapes. Do not harvest citrus fruit within 14 days of last application.

FRUIT CROPS WEED MANAGEMENT

GRAPE (Muscadine and Bunch)

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE:			
diuron @ 1.6-4 lb./A	Diuron 4L @ 1.6-4 qt/A Karmex DF, Diuron 80 DF @ 2-5 lb./A	Annual weeds	Apply only under vines established 3 years in the spring before annual weeds emerge. DO NOT apply to vines with trunks less 1.5 inches in diameter. DO NOT use on soils with less than 1% organic matter. Severe injury may occur if heavy rainfall or more than 1 inch of irrigation water follows treatment.
oxyfluorfen @ 1.2-2 lb./A	Goal 2XL, Galigan @ 5-6 pt./A Goal Tender @ 2.5 -4.0 pt./A	Preemergence control of broadleaf and some grass weeds; provides burndown of young, emerged weeds.	DORMANT SEASON APPLICATION ONLY. Apply prior to bud swell or after vines have initiated dormancy in the fall. Use in minimum of 20 gal. of water per acre or 40 gal. if weeds are present. Vines must be on trellis wire a minimum of 3 feet from soil surface.
simazine @ 2-4.8 lb./A	Princep Caliper 90, Simazine 90 DF @ 2.2-5.3 lb./A Princep 4L, Simazine 4L @ 1.6-4 qts/A	Annual grasses, certain broadleaves	Use only under vines established for 3 years. Apply in fall or spring. If applied in the fall, follow with a different preemergence herbicide in spring. DO NOT use on sandy, sandy loam or gravelly soils.
oryzalin @ 2-6 lb./A	Surflan A.S., Oryzalin 4 A.S. @ 2-6 qts/A	Annual grasses, certain annual broadleaf weeds	Apply in spring to bearing vines. DO NOT apply to newly established vines until soil is settled. Existing weed growth should be destroyed by shallow tillage or other treatment. Irrigation needed (1 1/2 inches) within 21 days to move Surflan into weed germination zone.
norflurazon @ 2.0–3.9 lb/A	Solicam DF @ 2.5-5.0 lb./A	Annual grasses, broadleaf weeds; suppression of established nutsedge and perennial grasses	Apply as a directed spray to the soil. Avoid contact with fruit or foliage. Soil should be settled, firm and relatively free of weeds and debris at the time of application. Solicam DF will not control emerged weeds. Soil should be free of depressions around trees where rain or irrigation water can concentrate. Solicam DF must be moved into the weed seed germination zone to be effective. If no rainfall occurs within 4 weeks after application, the product must be incorporated by flood or sprinkler irrigation.
flumioxazin @ 0.188-0.38 lb./A	Chateau 51WDG @6-12 oz./A	Broadleaf and grass weeds	Do not allow spray or spray drift to come in contact with the tree foliage. Grapes established less than 2 years must be trellised and trunk protected with a grow tube or waxed container. Do not make a sequential application within 60 days of the first application or apply less than 60 days before harvest. Moisture is necessary to activate herbicide on soil.

FRUIT CROPS WEED MANAGEMENT

GRAPE (Muscadine and Bunch)

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE continued:			
pendimethalin @ 3.04-5.99lb/A	Prowl H ₂ O @ 3.2 -6.3 qts/A	Broadleaf weeds, annual grasses	Do not feed forage or graze livestock in treated vineyards. Do not apply within 90 days of harvest. Prowl H ₂ O may be applied as a single application or sequentially with a 30-day interval between applications. DO NOT apply more than 6.3 qt. per acre per season.
POSTEMERGENCE:			
fluazifop @ 0.25-0.375 lb./A	Fusilade DX @ 16-24 oz/A Adjuvant required; see label	Perennial and annual grasses	Apply at postemergence to bearing and nonbearing vines. Use flat fan nozzle and do not contact foliage. Maintain a minimum of 14 days between applications. Do not apply more than 72 fl. oz. of Fusilade DX per acre per season to grapes. Do not harvest grapes within 50 days of last application.
sethoxydim @ 0.3-0.5 lb./A	Poast @ 1.5-2.5 pt./A Always use nonphytotoxic oil concentrate.	Annual grasses, some perennial grasses	Apply at postemergence to bearing and nonbearing vines. Use flat fan nozzle tips. Use low rate on annual grasses up to 6 inches tall; high rate on annual grasses up to 12 inches tall.
DIRECTED POSTEMERGENCE:			
paraquat @ 0.64-1.0 lb./A	Gramoxone SL @ 2.5-4 pt./A Add an approved nonionic surfactant at 1-2 pt./100 gal. spray	Annual grasses, broadleaf weeds; top kill and suppression of perennials in the interspaces and around base of bushes or vines	Apply when grasses are succulent and new growth is from 1- to 6-inches high. Apply as directed spray in 30 gal. water. For mature, woody weeds, late germinating weeds and perennials, retreatment or spot treatment may be necessary. Do not allow spray to contact green stems, fruit or foliage. Do not spray under windy conditions and use shield for young vines. Do not allow animals to graze on treated areas.
glyphosate @ 1-5 lb./A	Glyfos, Honcho, Glyphyogan and various generic 4lb/gal formulations @ 1-5 qts/A. Various Roundup formulations, See label for rates.	Annual and perennial weeds	Apply at postemergence. Use lower rates for easier-to-control annual easier-to-control weeds and higher rates on harder to control weeds. DO NOT allow spray to contact foliage or green bark of canes. Allow a minimum of 14 days between last application and harvest. Wiper applicator: 33% solution can be used.
glufosinate-ammonium @ 0.88-1.5 lb/A	Rely 280 @48-82 oz/A	Postemergent control of grass and broadleaf weeds, both annual and perennial	Lower rates may be used to control weeds less than 3 tall. Higher rate is needed for larger weeds 3- to 6-inches tall. Do not allow spray drift to contact leaves or green canes; can result in severe damage. Do not make more than 3 applications per year. Do not apply this product within 14 days of grape harvest. Do not graze, harvest and/or feed treated vineyard cover crops to livestock.

FRUIT CROPS WEED MANAGEMENT

MAYHAW

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE			
oxyfluorfen @ 1.25-2.0 lb/A	Goal 2XL, Galigan @ 5-6 pt./A GoalTender @ 2.5-4 pt./A	Preemergence control of broadleaf and some grass weeds; provides burndown of young, emerged weeds.	Dormant season application only. Apply prior to bud swell or after trees have initiated dormancy in the fall. Use in minimum of 20 gal. of water per acre or 40 gal. if weeds have emerged.
oryzalin @ 2-6 lb/A	Surflan A.S., Oryzalin 4 A.S. @ 2.0-6.0 qts/A	Annual grasses, certain annual broadleaf weeds	Apply before annual weeds emerge. Can be applied to new plantings after soil has settled. Use low rate for short-term control; high rate for long-term control. Apply in strip in tree rows; do not apply to row middles or drive rows.
DIRECTED POSTEMERGENCE:			
glyphosate ¹ @ 1-5 lb/A	Glyfos, Honcho, Glyphogan and other 4 lb/gal formulations @ 1-5 qt/A. Various Roundup formulations, See label for rates.	Annual and perennial weeds	For use on bearing and nonbearing trees. DO NOT allow spray to contact green shoots or foliage. Allow a minimum of 1 day between application and harvest. Use lower rates for easier to kill annuals and higher rates for harder to kill weeds.
carfentrazone @ 0.016-0.031 lb/A	Aim 2EC @ 1-2 oz/A Apply with COC @ 1 gal./100 gal. or NIS @ 2 pt./100 gal.	Postdirected application for control of susceptible broadleaf weeds	Lower rates may be used to control small seedling weeds at the 2-3 leaf stage. Higher rate is needed for larger weeds up to the 6 leaf stage. Applications to weeds beyond the 6-leaf stage may result in only partial control.
pyraflufen ethyl @ 0.02-0.08 oz./A	Venue @ 1-4 oz./A	Broadleaf weeds	Trees established less than 1 year should be protected with nonporous wraps, grow tubes or waxed containers. Do not exceed 6.8 fluid oz. per acre per season.

FRUIT CROPS WEED MANAGEMENT

PEACH

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE:			
diuron @ 1.6-2.2 lb./A	Diuron 4L @ 1.6-2.2 qt/A Karmex DF, Diuron DF @ 2-2.75 lb/A	Annual weeds	Use only where peach trees have been established for at least 3 years. Apply as directed spray, avoiding contact of fruit and foliage with spray. Do not use on sand, loamy sand, gravelly soils or exposed subsoils. Do not use on soils with less than 1% organic matter. Can also be tank-mixed with other soil active herbicides for improved control of a wider range of weed species.
terbacil @ 1.6-3.2 lb./A	Sinbar 80W @ 2-4 lb./A	Annual weeds	Apply in the spring. Use Sinbar only under trees established in the orchard for at least 3 years. Some chlorosis of weakened trees occurs. Control of established perennial weeds may be erratic. DO NOT use on sandy, sandy loam, gravelly soils, on eroded areas where subsoil tree roots are exposed or on any soil with less than 1% organic matter.
diuron @ 0.8-1.6 lb./A + terbacil @ 0.08-1.6 lb./A	Karmex DF @ 1.0-2.0 lb./A + Sinbar 80W @ 1.0-2.0 lb./A	Annual weeds	Apply in spring or after harvest in the fall before weeds emerge or less than 2 inches tall. Use this tank-mix only under trees established for at least 2 years. The combination provides improved weed control over Karmex or Sinbar alone. DO NOT USE on sandy, loamy or gravelly soils.
norflurazon @ 2.0–3.9 lb./A	Solicam DF @ 2.5-5.0 lb./A	Annual grasses, broadleaf weeds	Apply prior to weed seed germination and rainfall or irrigation is likely within 4 weeks of application. Apply postharvest in the fall or early spring. Delay application to newly established trees until 18 months after planting if west of the Mississippi River, and 6 months if east of the river. Do not apply within 60 days of harvest. Use the low rate on coarse-textured soils, high rate on fine-textured soils. Make one application per year. DO NOT graze treated areas.
oryzalin @ 2-6 lb./A	Surflan A.S., Oryzalin 4 A.S. @ 2.0-6.0 qt./A	Annual grasses, certain annual broadleaf weeds	Apply before annual weeds emerge. Can be applied to new plantings after soil has settled. Apply in strip in tree rows; do not apply to row middles or drive rows.
simazine @ 2.0-4.0 lb./A	Princep Caliber 90 @ 2.2-4.4 lb./A Princep 4L, Simazine 4L @ 1.6-4 qts/A	Annual grasses, certain broadleaf weeds	Use simazine ONLY under trees established in the orchard for 1 year. Apply in fall or spring. Fall application controls a broader weed spectrum than a spring application. If applied in the fall, follow a different preemergence herbicide in the spring. Use the low rate on coarse-textured soils. Some chlorosis may be observed in areas where little or no topsoil is present. DO NOT apply to gravelly, sandy or sandy loam soils.

FRUIT CROPS WEED MANAGEMENT

PEACH

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE continued:			
oxyfluorfen @ 1.25-2 lb/A	Goal 2XL @ 5-8 pt./A	Preemergence control of broadleaf and some grass weeds; provides burndown of young emerged weeds.	Apply as a directed spray to the soil and the base of trees. For additional postemergence weed control, Goal 2XL may be tank-mixed with Simazine or Surflan. When tank-mixing, always read and follow all product labels. APPLY ONLY TO DORMANT TREES prior to bud swell.
pendimethalin @ 1.9-3.99 lb./A	Prowl H ₂ O @ 2.0 -4.2 qt./A	Broadleaf weeds, annual grasses	Do not feed forage or graze livestock in treated orchards. Do not apply within 60 days of harvest. DO NOT apply more than 4.2 qt. per acre per season.
POSTEMERGENCE:			
clethodim @ 0.07-0.12 lb./A	Select Max @ 9-16 fl oz./A	Annual and perennial grasses	Apply before grasses exceed height limitations. Always add an adjuvant or crop oil concentrate to spray. Refer to label. Apply to bearing and nonbearing plants. The PHI for Select Max is 14 days.
DIRECTED POSTEMERGENCE:			
paraquat @ 0.64-1.0 lb./A	Gramoxone SL @ 2.5-4 pt./A	Annual grasses, broadleaf weeds; top kill and suppression of perennials	Apply as a directed spray when weeds and grasses are succulent and new growth is from 1- to 6-inches high. Apply in water at 30-150 GPA. For mature, woody weeds, green suckers, late germinating weeds, re-treatment or spot treatment may be necessary. Do not allow spray to contact green stems, fruit or foliage. Do not spray under windy conditions. Use a shield for young trees. Do not harvest within 14 days of application. No more than 3 applications per year may be used.
fluazifop @ 0.19-0.37 lb./A	Fusilade DX @ 12-24 oz./A Apply with COC @ 1 qt./25 gal. or NIS @ 0.5 pt./25 gal.	Perennial and annual grasses	Apply to trees that will not be harvested within 14 days of application. Apply as a directed spray using 25 gal. water/acre 30 to 60 psi pressure. Use flat fan nozzle tips, and do not contact tree foliage.
sethoxydim @ 0.3-0.5 lb./A	Poast @ 1.0-2.5 pt./A Apply with a non-phytotoxic oil concentrate @ 1 qt./A	Annual and perennial grasses	Apply as a directed spray using 20-50 gal. water/A at 40-60 psi pressure. Use flat fan nozzle tips. Use low rate on annual grasses up to 6 inches tall and high rate on annual grasses up to 12 inches tall. Do not apply within 25 days of harvest.
carfentrazone @ 0.016-0.031 lb./A	Aim 2EC @ 1-2 oz./A Apply with COC @ 1 gal./100 gal. or NIS @ 2 pt./100 gal.	Postdirected application for control of susceptible broadleaf weeds.	Lower rates may be used to control small seedling weeds at the 2- to 3-leaf stage. Higher rate is needed for larger weeds up to the 6-leaf stage. Applications to weeds beyond the 6-leaf stage may result in only partial control.

FRUIT CROPS WEED MANAGEMENT

PECAN

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE:			
oxyfluorfen @ 1.25 – 2.0 lb/A	Goal 2XL, Galigan @ 5-6 pt./A GoalTender @ 2.5 – 4 pt./A	Preemergence control of broadleaf and some grass weeds; provides burndown of young, emerged weeds.	Dormant season application. Apply prior to bud swell or after trees have initiated dormancy in the fall and after harvest. Use in minimum of 40 gal. of water per acre.
norflurazon @ 2-3.9 lb./A	Solicam DF @ 2.5-5.0 lb/A	Annual grasses, broadleaf weeds	Apply at preemergence. Apply only to trees planted at least 18 months west of Mississippi River or 6 months east of Mississippi River. Apply postharvest in the fall or early spring. Fall application controls a broader weed spectrum than spring. Use the low rate on coarse-textured soils, high rate on fine-textured soils. DO NOT graze treated areas.
oryzalin @ 2-6 lb./A	Surflan A.S., Oryzalin 4 A.S. @ 2.0-6.0 qts/A	Annual grasses, broadleaf weeds	Use for control of annual grasses and certain broadleaf weeds. Use low rate for shorter control (2-4 months.); high rate for long term control (6-8 months.). DO NOT apply to newly planted trees until soil has settled and no cracks are present. Apply before annual weeds emerge in the spring. Existing weed growth should be destroyed by shallow tillage or by a tank mixture with paraquat (1-2 qt./A + 8 oz. non-ionic surfactant/100 gal. of spray solution) or Roundup (1-5 qt./A + surfactant).
pendimethalin @ 1.9- 5.99lb/A	Prowl H ₂ O@ 2.0 -6.3 qts/A	Broadleaf weeds, annual grasses	Do not feed forage or graze livestock in treated groves or orchards. Do not apply within 60 days of harvest. DO NOT apply more than 6.3 qt. per acre per season.
flumioxazin @ 0.188-0.38 lb/A	Chateau SW @6-12 oz/A	Broadleaf and grass weeds	Do not allow spray or spray drift to come in contact with the tree foliage. Do not make a sequential application within 60 days of the first application. Moisture is necessary to activate herbicide on soil. Do not apply to farm alleys or roads where traffic may result in treated dust settling onto crops or other desirable vegetation.
napropamide @ 4.0 lb/A	Devrinol 50DF @ 8.0 lb/A Devrinol 2 EC @ 2 gal/A	Annual grasses, broadleaf weeds.	Apply to a weed-free soil surface. May be applied to newly planted or to established crop. Do not exceed a maximum application rate of 8 lb. per acre per crop cycle. Do not apply within 35 days of harvest
POSTEMERGENCE:			
clethodim @ 0.094-0.125 lb/A	Select @ 6-8 fl oz/A Always add an adjuvant or crop oil concentrate to spray, see label.	Annual and perennial grasses	Apply before grasses exceed height limitations. Apply to nonbearing plants only. Spray should be directed at the base of the tree, not on foliage. Do not graze treated areas.

FRUIT CROPS WEED MANAGEMENT

PECAN

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
DIRECTED POSTEMERGENCE:			
fluzifop @ 0.19-0.37 lb./A	Fusilade DX @ 12-24 oz./A Always use a non-phytotoxic crop oil concentrate or a nonionic surfactant.	Perennial and annual grasses	Apply as a directed spray using 25 gal./water/acre and 30 to 60 psi pressure. Use flat fan nozzle tips. DO NOT contact pecan tree foliage. Do not harvest within 30 days of application. Do not graze animals in treated areas.
paraquat @ 0.64-1.0 lb./A	Gramoxone SL @ 2.5-4 pt./A Add an approved nonionic surfactant at 1-2 pt./100 gal/spray.	Annual grasses, broadleaf weeds; top kill and suppression of perennials	Apply as directed spray when weeds are young and succulent (16 inches tall). Mature weeds are less susceptible. Apply in 30 gal. of water. Thorough weed coverage is essential. Repeat as necessary. Spray drift will cause injury. Do not allow spray to contact foliage, fruit or stems. Do not graze livestock on treated areas. No more than 5 applications may be made annually. All applications must be made prior to shaking for harvest.
sethoxydim @ 0.19-0.47 lb./A	Poast @ 1.0-2.5 pt./A Always use a non-phytotoxic oil concentrate (1 qt./A).	Annual and perennial grasses	Apply as directed spray to nonbearing trees that will not be harvested within 1 year of application. Apply in water at 20-50 gal. GPA using 40-60 PSI. Use flat fan nozzle tips. Use low rate on grasses up to 6 inches tall, and high rate on grasses up to 12 inches tall.
glyphosate ¹ @ 1-5 lb./A	Glyphos, Honcho, Glyphyogan and other 4 lb/gal formulations @ 1-5 qt./A.	Annual and perennial weeds	Apply as a directed spray. DO NOT allow spray to contact green shoots or foliage. Allow a minimum of 3 days between application and harvest. Use lower rates for easier to control annual weeds and higher rates for harder to control weeds.
carfentrazone @ 0.016-0.031 lb/A	Aim 2EC @ 1-2 oz/A Apply with COC @ 1 gal/100 gal or NIS @ 2 pt./100 gal.	Postdirected application for control of susceptible broadleaf weeds	Lower rates may be used to control small seedling weeds at the 2- to 3-leaf stage. Higher rate is needed for larger weeds up to the 6-leaf stage. Applications to weeds beyond the 6-leaf stage may result in only partial control.
glufosinate-ammonium @ 0.88-1.02 lb/A	Rely 280 @48-56 oz./A	Postemergent control of grasses and broadleaf weeds	Lower rates may be used to control weeds less than 3 inches tall. Higher rate is needed for larger weeds 3- to 6- inches tall. Do not apply this product within 14 days of nut harvest. Do not graze, harvest and/or feed treated orchard cover crops to livestock.
halosulfuron @0.032-0.63 oz./A	Sandea 75WDG@0.66-1.33oz./A	Postemergent control of yellow, purple and many other sedge species	Optimum application time is when actively growing sedges are at the 3- to 5-leaf stage. Avoid contact with pecan trees, or severe damage or death may occur. Use ONLY under trees established in the orchard for 1 year or more where soil is settled with no cracks. Do not apply at less than 1 day before harvest

FRUIT CROPS WEED MANAGEMENT

PECAN

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
CHEMICAL MOWING:			
glyphosate See label	Roundup and various generic formulations of glyphosate. See Label	Vegetation and bahiagrass seed head suppression	Apply 1 to 2 weeks after full greening of bahiagrass. Used for suppression in pecan row middles. Applications must be made prior to seedhead emergence. To extend period of growth suppression, apply up to two sequential applications at 45-day intervals. Sequential applications must be made prior to seedhead emergence.

¹ Glyphosate: refer to Appendix A for glyphosate formulations and required surfactants for various glyphosate products.

COMMERCIAL NURSERY AND LANDSCAPES WEED MANAGEMENT

COMMERCIAL NURSERY and LANDSCAPES

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE:			
benefin + oryzalin @ 4.0-6.0 lb/A	XL 2 G @200-300 lb./A or 4.5-7 lb./1,000 sq. ft.	Annual grasses, some broadleaves	May be used in commercial nursery production and landscape beds. Several annual and perennial landscape plants are tolerant. Consult product label.
bensulide @ 7.5-12.5 lb/A	Betasan 4E @ 15-25 pts/A or 5.6-7.3 oz/1000 sq. ft.	Annual grasses, some broadleaves	Several tolerant annual and perennial ornamentals. Check label for tolerant species and susceptible weeds. Irrigate to move product into weed seed germination zone. Do not use peat moss prior to application. May be used in landscape beds.
DCPA @ 10-15 lb/A	DCPA 5 G @ 218 lb/A or 5 lb/1000 sq. ft.	Annual grasses, some broadleaves	Several tolerant ornamentals. Commercial ornamental production and landscape bed use allowed. Consult label. Do not apply to pansies or phlox in landscape beds.
dimethenamid + pendimethalin @ 1.75 – 3.5 lb/A	FreeHand 1.75G @ 100 – 200lb/A or 2.3 – 4.6 lb/1000 sq. ft	Annual grasses, spurge, chickweed, oxalis, groundsel, bittercress, eclipta, <i>Phyllanthus</i> , doveweed, yellow nutsedge, annual sedges	Labeled for commercial nursery and landscapes. Broad spectrum herbicide with several weeds listed on the product label. Controls yellow nutsedge and annual sedges. May be applied to annual bedding plants. Consult product label.
isoxaben @ 0.5-1.0 lb/A	Gallery 75DF @0.66-1.33 lb/A or 0.24 –0.48 oz/1000 sq. ft.	Several broadleaves such as spurge, common purslane, pigweed, chickweed, oxalis	Several perennial groundcovers and woody ornamentals are tolerant in landscape plantings. Safe on several container trees and shrubs. Consult label for tolerant ornamental species and susceptible weeds. Application rates based on weed and ornamental species. One of the better broadleaf weed herbicides but does not control annual grasses and should be tank-mixed with another herbicide for broad spectrum weed control. Do not apply to annual beds.
proflam @ 0.65-0.75 lb/A	Barricade 65WG and Regalkade 65 WG @ 1.0-1.15 lb/A or 0.36–0.42oz/1000 sq. ft.	Grasses and small-seeded broadleaves like pigweed, spurge, and purslane	Labeled for commercial nursery production as well as landscape beds. Can be used in perennial and wildflower plantings. Use higher rate of application for longer control. Do not exceed 2.3 lb./A annually. Useful in landscape beds and safe on several annual and perennial bedding plants. Similar weed control spectrum as Surflan and Pendulum.
oxyfluorfen + pendimethalin @ 2 lb/A	OH II 2 G @ 100 lb/A or 2.3 lb/1000 sq. ft.	Annual grasses, Spurge, chickweed, oxalis, groundsel, bittercress, eclipta	For container and field grown ornamentals. Check label for tolerant ornamental species and susceptible weeds. Can be used for container or field grown ornamentals. Excellent control of several hard to manage weeds. Some suppression of <i>Phyllanthus</i> species. Do not use on bedding plants.

COMMERCIAL NURSERY AND LANDSCAPES WEED MANAGEMENT

COMMERCIAL NURSERY and LANDSCAPES

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE continued:			
napropamide @ 4-6 lb/A	Devrinol 50VWP @ 8-12 lb/A 3-4.4 oz/1000 sq. ft. Devrinol 5G @ 43 – 87 lb/A or 1 - 2 lb/1000 sq. ft.	Annual grasses, broadleaves	Several species of deciduous and evergreen trees and shrubs. Container grown <i>Juniperus</i> , <i>Rhododendron</i> , <i>Pittosporum</i> , <i>Euonymus</i> are common tolerant ornamentals. Check label for tolerant ornamental species and list of susceptible weeds. Mechanically incorporate or apply irrigation immediately to activate. Also labeled for highways, industrial and foundation plantings.
oxadiazon @ 2-4 lb/A	Ronstar 2 G @ 100-200 lb/A or 2.25-4.5 lb/1000 sq. ft.	Annual grasses, broadleaves; weak on chickweed	Check label for tolerant ornamental species and susceptible weeds. Injury has been observed on ajuga, liriopie, and mondgrass. Wash granules off foliage. Not labeled for residential areas.
oxyfluorfen + oryzalin @ 2.0 lb/A	Rout 2 G @ 100 lb/A or 2.3 lb/1000 sq. ft.	Annual grasses, spurge, chickweed, oxalis, groundsel, Bittercress, eclipta	For container and field grown ornamentals. Several perennial and woody ornamentals are tolerant. Do not apply to wet foliage. Water in to activate. Do not apply to plants that are breaking dormancy or making a flush of growth. Excellent broadleaf and grass control. Do not wait longer than 3 months before reapplying. Apply 2 weeks prior to greenhouse enclosure. Do not use on bedding plants.
isoxaben + oxyfluorfen + trifluralin @ 1.25 – 2 lb/A	Showcase @ 100 – 200 lb/A or 2.3 – 4.6 lb/1000 sq. ft.	Annual grasses, several hard to control broadleaves including eclipta	Many container and field grown ornamentals are tolerant. Consult product label for tolerant ornamental species and susceptible weeds. Can be used for landscapes, field and container production. Excellent broad spectrum weed control. Improved control of <i>Phyllanthus</i> . Do not apply to bedding plants.
trifluralin + isoxaben @ 2.5-5.0 lb/A	Snapshot 2.5 TG @ 100-200 lb/A or 2.3 - 4.6 lb/1000 sq. ft.	Annual grasses, broadleaves	Several perennial groundcovers and woody ornamentals are tolerant. Consult product label for tolerant ornamental species and susceptible weeds. Several herbaceous species listed. Can be used for landscapes, field and container production. Excellent broad spectrum weed control; however, poor to fair on <i>Phyllanthus</i> . Do not apply to bedding plants.
oryzalin @ 2.0-4.0 lb /A	Surflan 4 AS @ 2-4 qt/A or 1.5-3.0 oz/1000 sq. ft.	Annual grasses, some small seeded broadleaves	Can be used for landscapes, field and container production. Check label for tolerant ornamental species and list of susceptible weeds. Similar weed spectrum as Pendulum and Barricade or Regalkade.
norflurazon @ 2.4 lb /A	Predict 80DF @ 3 lb/A or 1.1 oz/1000 sq. ft.	Annual grasses, broadleaves	Check label for tolerant ornamental species and susceptible weeds. Apply as broadcast or as a band treatment in fall and spring.

COMMERCIAL NURSERY AND LANDSCAPES WEED MANAGEMENT

COMMERCIAL NURSERY and LANDSCAPES

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE continued:			
flumioxazin @ 0.38 lb/A	Broadstar 0.25 G @ 150 lb/A 3.44 oz/1000 sq. ft.	Doveweed, liverwort, bittercress, spurges, other broadleaf weeds	Apply at preemergence. Provides 8-12 weeks of control. Several trees, shrubs and groundcovers are listed as tolerant. Container and field grown plants only. Some potential for injury so consult product label for tolerant plant species. Has good activity on <i>Phyllanthus</i> (chamberbitter).
flumioxazin @ 0.25 – 0.38 lb/A	Sureguard 51 WG @ 8 – 12 oz/A or 0.18–0.28 oz/1000 sq. ft.	Doveweed, liverwort, bittercress, spurges, other broadleaf weeds	Provides preemergence and some postemergence control. Container and field production of several woody ornamentals. For commercial ornamental production: good fit for field production as a directed spray. Useful in container nurseries to maintain weed free production areas. Same active ingredient that is found in the granular herbicide Broadstar. (Broadstar is a better fit for container use). Excellent pre- and post-control of doveweed. Can now be used as directed sprays in commercial or residential landscapes around woody ornamentals. Apply at least 30 days after planting new woody transplants. Consult supplemental label.
oxyfluorfen @ 0.25-1.0 lb/A	Goal T/O 1.6E @ 1.25-5 pts/A or 0.46-1.84 z/1000 ft ²	A few annual grasses, several broadleaves, including bittercress	Apply at preemergence in conifers and several field grown trees. Herbicide has some postemergence activity. Good activity on several broadleaf weeds including winter annuals.
pronamide @ 1.0-2.0 lb/A	Kerb 50 WSP @ 2.0-4.0 lb/A	Grasses, some broadleaves	Apply at preemergence and has some postemergence activity on annual bluegrass. Check label for tolerant ornamental species and susceptible weeds. RESTRICTED USE.
pendimethalin @ 1.7 – 3.0 lb/A	Pendulum 3.3 EC @ 3.6–4.8 pt/A or 1.3–1.8 oz/ 1000 sq. ft. Pendulum AquaCap 3.8 @ 3.1 – 6.2 pt/A or 1.15 oz – 2.3 oz/1000 sq. ft. Pendulum 2G @ 75–150 lb/A or 1.7 – 3.4 lb/1000 sq. ft.	Annual grasses, broadleaves	Most annual and perennial ornamentals are tolerant. Can be used in landscape beds due to good ornamental tolerance. Consult label for list of tolerant plants.
simazine @ 2.0-4.0 lb/A	Princep 4L @ 2-4 qt/A or 0.73-2.20 oz/1000 sq. ft.	Annual grasses, winter broadleaves	Several field grown conifer including Christmas trees and deciduous trees weeds. Apply in at least 25 gal. water/A in fall or spring. Do not apply to plantings less than 1 year old. Do not apply to landscape beds.

COMMERCIAL NURSERY AND LANDSCAPES WEED MANAGEMENT

COMMERCIAL NURSERY and LANDSCAPES

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE continued:			
metolachlor @ 1.2 – 2.45 lbs/A	Pennant Magnum 7.62 EC @1.3 - 2.6 pt/A or 0.48-0.96 oz/1000 sq. ft	Annual grasses, yellow nutsedge, some annual sedges small seeded broadleaves	Registered for commercial ornamental production and landscape areas. Several tolerant ornamentals including many annual and perennial landscape plants. Check label for tolerant ornamental species and susceptible weeds. Rates vary for different soil types and control time desired. Similar weed control spectrum as Pendulum but additionally controls yellow nutsedge. Does not control purple nutsedge.
oxadiazon @ 2.0-4.0 lb/A	Ronstar 2G @ 100-200 lb/A 2.30 – 4.60 lb/1000 sq. ft.	Annual grasses and broadleaves	May be used in container and field commercial nursery production. Check label for tolerant ornamentals and list of susceptible weeds. Do not apply to annuals. Weak on chickweed. Cannot be used in residential landscape beds.
trifluralin (2.0%) + isoxaben (0.5%) @ 2.5-5.0 lb	Snapshot 2.5TG @ 2.3 – 4.6 oz/1000 ft ² 100-200 lb/A	Annual grasses and broadleaves	Check label for tolerant ornamental species and list of susceptible weeds. Application rate determined by weed species desiring to control.
oryzalin @ 2.0-4.0 lb ai/A	Surflan 4 AS @ 2.0 – 4.0 qt/A or 1.5–3.0 oz/1000 sq. ft.	Annual grasses, broadleaves	Labeled for commercial nursery production and landscape beds. Several tolerant annual and perennial ornamentals. Slightly more injury potential with this herbicide than similar herbicides (Pendulum, Barricade etc.) because product is more water soluble. Consult product label. Rain or irrigation needed to activate. Low rate: 2-4 Months control. High rate: 6-8 months control.
POSTEMERGENCE:			
clopyralid @ 0.09 – 0.50 lb/A	Lontrel 3 EC @ 0.25 – 1.33 pt/A or 0.125oz – 0.5 oz/1000 sq. ft.	Legumes, asters, thistles	Labeled for use in certain woody tree and shrubs as over the top or directed sprays <u>field</u> nurseries and landscape plantings. May also be used in field grown lilies. Apply no more than 1.33 pt./A per season. Mimosa, redbud, locust will be injured or killed by Lontrel. Do not apply to residential landscape plantings or container ornamentals.
oxyfluorfen @ 0.25-0.50 lb/A	Goal T/O 1.6E @ 0.46 – 0.92 oz/1000 ft ² or 1.25-2.5 pts/A	Annual grasses, broadleaves including bittercress, chickweed	Control of small actively growing weeds in conifers and several field grown trees. Works by contact so good coverage is a must.

COMMERCIAL NURSERY AND LANDSCAPES WEED MANAGEMENT**COMMERCIAL NURSERY and LANDSCAPES**

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE continued:			
bentazon @ 0.75-1.0 lb/A	Basagran T/O 4L @ 1.5-2.0 pts/A or 0.5 -.75 oz/1000 sq. ft	Yellow nutsedge, annual sedges	Postemergence directed spray in many established ornamental beds. Not systemic so weed coverage is very important. Will not control purple nutsedge. Control optimized by a second application within 10 days. Check label for recommended uses. Crop oil will increase activity.
flumioxazin @ 0.25 – 0.38 lb/A	Sureguard 51 WG @8 – 12 oz/A or 0.18–0.28 oz/1000 sq. ft.	Doveweed, bittercress, spurges, other broadleaf weeds	Apply at preemergence and postemergence. Container and field production of several woody ornamentals. For commercial ornamental production: good fit for field production as a directed spray. Useful in container nurseries to maintain weed free production areas. Same active ingredient that is found in Broadstar. Excellent pre- and post-control of doveweed. Can be used as directed sprays in commercial or residential landscapes around woody ornamentals. Apply at least 30 days before new woody transplants.
POSTEMERGENCE GRASS KILLING HERBICIDES:			
fenoxaprop @ 0.1-0.3 lb/A	Acclaim IEC @ 4-45 oz/A 0.34-1.0 oz/1000 sq. ft.	Annual grasses, suppression of perennial grasses	Apply postemergence. Apply herbicide to actively growing grasses. More active on annual than perennial grasses. Can be used over the top of many herbaceous and woody ornamentals. Ornamental grasses may be injured or killed. Check label for recommended uses.
sethoxydim @ 0.3-0.5 lb/A	Segment IEC @ 36-60 oz/A or 0.82–1.65 oz/1000 sq. ft.	Annual and perennial grasses	Herbicide only controls grasses. Several nongrass ornamentals are tolerant for over the top applications but consult product label for sensitive plants. Limited suppression of torpedograss with multiple applications.
clethodim @ 0.125-0.25 lb	Envoy 0.94EC @ 17-34 oz/A or 0.39 – 0.78/1000 sq. ft.	Annual and perennial grasses	Apply postemergence for actively growing grasses. Add 0.25% v/v non-ionic surfactant (1 pt./50 gal.). Crop oil concentrate not recommended.
fluzafop @ 0.25-0.40 lb/A	Fusilade II EC @ 17-26 oz/A Spot sprays 0.75 oz/gallon	Annual and perennial grasses	Herbicide only controls grasses. Several nongrass ornamentals are tolerant for over the top applications but consult product label for sensitive plants. Restrictions on juniper and azalea cultivars. Somewhat more effective on torpedograss with multiple applications compared to sethoxydim. Add a NIS at 0.25% v/v.

COMMERCIAL NURSERY AND LANDSCAPES WEED MANAGEMENT

COMMERCIAL NURSERY and LANDSCAPES

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
SEDGE KILLING HERBICIDES FOR LANDSCAPE :			
sulfosulfuron @ 0.05 - .09 lb/A	Certainty 75 WG @ 1.25 – 2.0 oz/A or 0.03 – 0.04 oz/1000 sq. ft. Apply with non-ionic surfactant.	Yellow and purple nutsedge, green kyllinga, johnsongrass	Now labeled for sedge control in ornamentals. Apply as a directed spray around woody ornamentals. Several landscape and field nursery plants will tolerate over-the-top applications. Consult product label.
imazaquin @ 0.38 - 0.5 lb/A	Image 70 DG @ 8.6 – 11.4 oz or 0.2 – 0.26 oz/1000 sq. ft.	Suppresses green kyllinga, yellow and purple nutsedge; weaker on yellow nutsedge; good on purple nutsedge; broadleaves, suppression of dollarweed	Landscape use only. Check label for tolerant ornamental species and susceptible weeds. Limited number of ornamentals that will tolerate over-the-top applications on label. Liriope and mondograss will tolerate certain rates in over the top applications. Azaleas may be injured by this herbicide.
halosulfuron @ 0.03-0.06 lb/A	Sedgehammer 75 WDG @ 0.6 - 1.33 oz/A or 0.138 – 0.03 oz/1000 sq. ft. 0.25 teaspoon/gal spot spray	Nutsedges (purple & yellow); suppression of kyllinga species	Apply as a directed spray around woody ornamentals in landscape plantings. Very effective on yellow and purple nutsedge. Add a non-ionic surfactant.
NON-SELECTIVE			
glyphosate ¹ @ 1.0-5.0 lb/A	Roundup Pro 41% and generics @ 1-5 qt/A or 1.5-3.7 oz/1000 ft ² Use 2% solution for spot treatments. Use a 10% solution for dollarweed and torpedograss.	Grasses, broadleaves	Check label for recommended uses. Nonselective so avoid all drift. Labeled for greenhouse use. Consider wiping in landscape beds. Use a 10% solution for dollarweed and torpedograss.
potassium salt	Sharpshooter 18% @ 5.5-11 oz/qt/water	Grasses, broadleaves	Apply postemergence. Check label for recommended uses. Nonselective. Apply to young, succulent, actively growing weeds. Labeled for greenhouse use. Good activity on small annual weeds. Very poor control on perennial weeds.
paraquat @ 0.6-0.9 lb/A	Gramoxone Max @ 0.66 oz/1000 ft ² 1.8 pt/A	Annual grasses, broadleaves	Apply postemergence in field produced woody ornamentals. Check label for recommended uses. Nonselective. Poor on perennial weeds. RESTRICTED USE.
diquat @ 0.25 – 0.50 lb/A	Reward @ 1 – 2 pt/A or 0.36 – 0.72 oz	Most annual grasses and broadleaves	Contact herbicide labeled for use in commercial greenhouses and nurseries. Postdirected in field ornamentals. Good coverage is a must. Add a non-ionic surfactant at 0.25% v/v. Poor on perennial weeds.
glufosinate ammonium @ 0.75 – 1.5 lb/A	Finale I SL @ 3-6 qt/A or spot treatment 1.5-4.0 oz/gal	Nonselective control of several grasses and broadleaves	Mostly contact herbicide. Less effective on perennial plants due to limited translocation. Very good herbicide on escaped jasmine.

¹ See “Appendix A” for glyphosate products and surfactant requirements.

VEGETABLE WEED MANAGEMENT

ARTICHOKE

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE:			
pronamide @ 2-4 lbs/A	Kerb 50 W @ 4-8 lb/A	Broadleaf weeds, annual grasses	Apply after transplanting but before new shoots develop 3-4 new leaves. Do not apply within 60 days of harvest. Refer to label for plant back restrictions.
POSTEMERGENCE:			
sethoxydim @ 0.09-0.47 lb/A	Poast @ 0.5-2.5 pts/A Mix with COC @ 2 pts/A Pump up sprayer: 1/3-2 oz/gal Poast + 1.3 oz/A gal COC	Annual and perennial grasses	Consult label for recommended adjuvants and rates. Do not apply within 7 days of harvest. Use with caution when temperatures exceed 90 F and relative humidity is 60% or higher because of potential leaf injury. Not recommended when temperatures exceed 100 F.
DIRECTED POSTEMERGENCE:			
oxyfluorfen @ 1-1.5lbs/A	Goal @ 4-6 pts/A Goaltender @ 2-3 pts/A Galigan @ 4-6 pts/A Galigan H2O @ 2-3 pts/A	Broadleaf weeds preemergence to 8-leaf stage	DO APPLY OVER THE TOP. Apply as a directed spray to the soil surface between rows and at the base of the plant in 40 GPA. Separate applications by 8-10 weeks or a single application can be made. Check label for rates.
pronamide @ 2-4 lbs/A	Kerb 50 W @ 4-8 lb/A	Broadleaf weeds, annual grasses	Application maybe directed to soil surface between the rows. Consult label for recommended adjuvants. Do not apply within 60 days of harvest. Refer to label for plant back restrictions.
paraquat @ 0.63-1.0 lbs/A	Gramoxone Inteon @ 2.5-4 pts/A Firestorm @ 1.7-2.7 pts/A Parazone @ 1.7-2.7 pts/A Mix with NIS @ 1-2 pts/100 gal or with COC @ 1 gal/100 gal	Emerged small, annual broadleaf weeds and grasses; top kill and suppression of perennial weeds	Apply to row middles using a hooded sprayer in a minimum of 20 GPA. Surfactant is required; consult label. Do not apply within 24 hours of harvest. Do not exceed 3 applications per year.
glyphosate @ 0.5-1.4 lbs/A	Roundup Weathermax @ 11-32 oz/A Various 4 L brands @ 16-45 oz/A Various 5 L brands @ 11-32 oz/A	Most emerged weeds	Apply to row middles using a hooded or shielded sprayer or a wiper applicator. To avoid injury keep herbicide off foliage, shoots, stems, exposed roots and fruit. Do not apply within 14 days of harvest.

VEGETABLE WEED MANAGEMENT

ASPARAGUS

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE:			
diuron @ 0.75-3.0 lbs/A	Direx 4 L, Diuron 4L @ 1.5-3 pt/A on light soil 3-6 pt/A on clay soil Direx 80DF, Diuron 80WP, Karmex 80DF @ 1-2 lb/A on light soil 2-4 lb/A clay	Annual broadleaf and grass weeds	Apply no earlier than 4 weeks before spear emergence and no later than early spear emergence. Do not apply to young plants during first growing season after setting or on plants with exposed roots. Check label for tank-mixes with other herbicides.
linuron @ 1.0-2.0 lbs/A	Lorox 50 DF @ 2-4 lb/A	Most small-seeded annual grasses and broadleaf weeds	Established beds apply before cutting season. Lorox can be used on newly planted crowns. One day to harvest.
paraquat @ 0.63-1.0 lbs/A	Gramoxone Inteon @ 2.5-4 pts/A Firestorm @ 1.7-2.7 pts/A Parazone @ 1.7-2.7 pts/A Mix with NIS @ 1-2 pts/100 gal or with COC @ 1 gal/100 gal	Emerged small, annual broadleaf weeds and grasses; top kill and suppression of perennial weeds	Apply in a minimum of 20 GPA to control emerged weeds before spears emerge or after last harvest.
metribuzin @ 1-2 lbs/A	Sencor 4 FL@ 2-4 pt/A Sencor 75DF, Metribuzin 75DF @ 1.33-2.67 lb/A	Annual broadleaf weeds and grasses	Early spring before spears and ferns emerge. Do not use on young plants during first growing season after setting crowns.
terbacil @ 0.8-2 lbs/A	Sinbar WP @ 1.5-2.5 lbs/A	Annual broadleaf weeds and grasses	Use only on established beds. Apply prior to spear and weed emergence or to small weeds. Do not use on areas where subsoil or roots are exposed.
norflurazon @ 2-4 lbs/A	Solicam DF @ 2.5-5 lbs/A	Most small-seeded annual grasses and broadleaf weeds; fair on nutsedge	Use on plantings that have been established for at least one year.
flumioxazin 0.188 lbs/A	Chateau @ 6 oz/A NIS at 1 quart/100 gals if weeds are present	Annual grasses and broadleaf weeds	Apply only to dormant asparagus no sooner than 14 days before spears emerge or after last harvest. Do not apply more than 6 oz./A during a single growing season. Provides residual weed control. Can be tank-mixed with paraquat for control of emerged weeds. Apply a minimum of 15 GPA.
POSTEMERGENCE:			
diuron @ 0.75-3.0 lbs/A	Direx 4 L, Diuron 4L @ 1.5-3 pt/A on light soil 3-6 pt/A on clay soil 80 DF - Direx, Diuron, Karmex @ 1-2 lb/A on light soil 2-4 lb/A clay	Annual broadleaf and grass weeds	Early spear emergence; second application immediately following harvest. Do not apply to young plants during first growing season or on plants with exposed roots. Check label for tank-mixes with other herbicides.

VEGETABLE WEED MANAGEMENT

ASPARAGUS

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE continued:			
halosulfuron @ 0.024-0.072 oz/A	Sandea 75 DF or Profine 75 DF @ 0.5-1.5 oz./A	Yellow and purple nutsedge, several broadleaf weeds	Apply before or during harvest. Do not use NIS or COC because unacceptable crop injury may occur. Contact with ferns may result in temporary yellowing. Under heavy nutsedge pressure, use split applications. Do not exceed 2 oz./A/year.
fluazifop-P-butyl @ 0.1-0.375 lb/A	Fusilade DX @ 0.375 – 1.5 pt/A	Annual and perennial grasses	Apply to actively growing grasses before they exceed the recommended growth stages shown on the label. One day to harvest. Make sequential applications at least 14 days apart. Max use rate is 3 pt./A/season.
paraquat @ 0.63-1.0 lbs/A	Mix with COC @ 1-2 pts/25 gal or with NIS @ 0.5-1 pt/25 gal Gramoxone Inteon @ 2.5-4 pts/A Firestorm @ 1.7-2.7 pts/A Parazone @ 1.7-2.7 pts/A	Emerged small, annual broadleaf weeds and grasses; top kill and suppression of perennial weeds	Surfactant required; check label for recommendations. Apply in a minimum of 20 gal. water/A. Use on asparagus at least 2 years old. Do not apply within 6 days of harvest.
sethoxydim @ 0.09 -0.47 lbs/A	Mix with NIS @ 1-2 pts/100 gal Poast 1.5 EC @ 0.5-2.5 pts/A	Annual and perennial grasses	Apply to grasses before they exceed the recommended growth stages. Don't apply more than 5 pt./A/season. Should be used with caution when temperatures exceed 90 F and relative humidity is 60% or higher. May be applied 1 day before harvest.
clethodim @ 0.1-.125 lb /A	Pump up sprayer: 1/3-2 oz/gal Poast + 1.3 oz/A gal COC Select Max @ 12-16 oz/A Mix with NIS @ 2pt /100 gals	Annual and perennial grasses, annual bluegrass	Check label for rates and restrictions on amount applied. For repeat applications, apply on a minimum 14-day interval. May be applied 1 day before harvest.
DIRECTED POSTEMERGENCE:			
linuron @ 0.5-1.0 lbs/A	Lorox 50 DF @ 1-2 lb/A	Most small-seeded annual grasses and broadleaf weeds	Established beds. Apply as a directed spray to base of ferns. Lorox can be used on newly planted crowns. Do not apply within one day of harvest.
glyphosate @ 0.5-1.4 lbs/A	Various 4 L brands @ 16-45 oz/A Various 5 L brands @ 11-32 oz/A	Most emerged weeds	Apply to row middles using a hooded or shielded sprayer or a wiper applicator. To avoid injury keep herbicide off foliage, shoots, stems, exposed roots and fruit. Do not apply within 14 days of harvest.
POSTHARVEST:			
metribuzin @ 1-2 lbs/A	Sencor 4 FL@ 2-4 pt/A Sencor 75DF, Metribuzin 75 DF @ 1.33-2.67 lb/A	Annual broadleaf weeds and grasses	After last harvest of season. Do not use first growing season after setting crowns.
paraquat @ 0.63-1.0 lbs/A	Gramoxone Inteon @ 2.5-4 pts/A Firestorm @ 1.7-2.7 pts/A Parazone @ 1.7-2.7 pts/A	Emerged small, annual broadleaf weeds and grasses; top kill and suppression of perennial weeds	Apply in a minimum of 20 GPA to control emerged weeds. Use on asparagus at least 2 years old. Mix with NIS @ 1-2 pt./100 gal.
halosulfuron @ 0.024-0.072 oz/A	Sandea 75 DF or Profine 75 DF @ 0.5-1.5 oz./A	Yellow and purple nutsedge, several broadleaf weeds	Apply after harvest with drop nozzles. Contact with ferns may result in temporary yellowing. Do not use an adjuvant. Don't exceed 2 oz./A/year.

VEGETABLE WEED MANAGEMENT**ASPARAGUS**

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTHARVEST: continued			
diuron @ 0.75-3.0 lbs/A	Direx 4 L, Diuron 4L @ 1.5-3 pt/A on light soil 3-6 pt/A on clay soil Direx 80DF, Diuron 80WP, Karmex 80DF @ 1-2 lb/A on light soil 2-4 lb/A clay	Annual broadleaf and grass weeds	Early spear emergence; second application immediately following harvest. Do not apply to young plants during first growing season or on plants with exposed roots. Check label for tank-mixes with other herbicides.

VEGETABLE WEED MANAGEMENT

SNAP AND LIMA BEANS^{3,4,5,6,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREPLANT INCORPORATED:			
S-metolachlor @ 0.95-1.9 lb/A	Dual Magnum, Dual II Magnum @ 1-1.3 pts/A on coarse soil 1.3-1.67 pts/A on med.-fine soil	Many small seeded grasses, yellow nutsedge and pigweed	Incorporate in top 2 inches of soil. Check label for tank-mixes with other herbicides. Consult label for rates on soils with more than 3% OM.
metolachlor @ 0.98-1.63 lbs/A	Medal, Stalwart, Parallel, Charger @ 1.0-1.3 pts/A on coarse soil @ 1.3-1.67 pts/A on med.-fine soil	Many small seeded grasses, yellow nutsedge and pigweed	Incorporate in top 2 inches of soil. Check label for tank-mixes with other herbicides. Higher rates can be used on soils with greater than 3% organic matter; consult label.
pendimethalin ² @ 0.5-1.5 lbs/A	Prowl 3.3, Pendimax 3.3 @ 1.2-1.8 pts/A on light soil 1.8-2.4 pts/A on med. soil 1.8-3.6 pts/A on heavy soil Prowl H2O @ 1-1.6 pts/A on light soil 1.6-2.1 pts/A on med. soil 2.1-3.2 pts/A on heavy soil	Many small-seeded grasses and broadleaves, including annual spurge, reduction from competition from smartweed and velvetleaf	If replanting is necessary, do not work soil deeper than the treated zone. Do not apply after planting (surface treatment) or serious injury can result. Check label for tank-mixes with other herbicides.
imazethapyr @ 0.023 lb/A on snap bean; 0.047 lb/A on lima bean	Pursuit 2 EC @ 1.5 oz/A snap bean 3 oz/A lima bean Pursuit DG @ 1.08 oz/A lima bean	Several broadleaf weeds including morningglory, pigweed, smart weed and purslane	May be tank-mixed with a grass herbicide. Check label for plant-back restrictions.
trifluralin ² @ 0.5-.75 lb/A	Treflan HFP, Trifluralin, Trilin, and other 4 EC products @ 1 pt/A on light soil 1.5 pts/A on med.-heavy soil 60 DF products @ 0.8 lb/A on light soil 1.33 lbs/A on med.-heavy soil	Small-seeded annual grasses, broadleaf weeds and seedling johnsongrass	Incorporate thoroughly in top 2 inches of soil just before planting. Check label for tank-mixes with other herbicides.
alachlor ² @ 1.5-3 lbs/A	Lasso, Micro Tech @ 1.5-2 qt/A on light soil 2.5-3 qt/A on med.-heavy soil Partner WDG @ 3.8-4.2 lbs/A on light soil 4.2-4.5 lb/A on med-heavy soil	Small-seeded annuals	Apply to lima beans only. May delay maturity and/or reduce yields if cold, wet soil conditions occur after planting. Check label for tank-mix options.
PREEMERGENCE:			
S-metolachlor @ 0.95-1.9 lb/A	Dual Magnum, Dual II Magnum @ 1-1.3 pt/A on coarse soil 1.3-1.67 pt/A on med.-fine soil	Many small-seeded grasses, yellow nutsedge and pigweed; most effective on nutsedge when incorporated	Check label for tank-mixes with other herbicides. Higher rates can be used on soils with more than 3% organic matter; consult label.

VEGETABLE WEED MANAGEMENT

SNAP AND LIMA BEANS^{3,4,5,6,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE continued:			
metolachlor @ 0.98-1.63 lbs/A	Medal, Stalwart, Parallel, Charger @ 1.0-1.3 pt/A on coarse soil @ 1.3-1.67 pt/A on med.-fine soil	Many small-seeded grasses, yellow nutsedge and pigweed; most effective on nutsedge when incorporated	Check label for tank-mixes with other herbicides. Higher rates can be used on soils with greater than 3% organic matter; consult label.
imazethapyr @ 0.023 lb/A	Pursuit 2 EC @ 1.5 oz/A	Several broadleaf weeds, including morningglory, pigweed, smart weed and purslane	Apply to snap beans only. May be tank-mixed with a grass herbicide. Check label for plant-back restrictions.
halosulfuron-methyl @ 0.024-0.036 lb/A	Sandea 75 DF or Profine 75 DF @ 0.5-1.5 oz./A	Nutsedge and other broadleaf weeds	Apply following planting; prior to cracking. Will provide residual weed control.
fomesafen @ 0.188 lbs/a	Reflex 2 EC @ 1.5 pt/acre	Many broadleaf weeds	Snap beans only. Apply preplant surface and preemergence. Check label for tank mixers. Total use cannot exceed 1.5 pt./A. Check label for instructions and precautions.
POSTEMERGENCE:			
quizalofop @ 0.04–0.08 lbs/A	Assure II @ 6-12 oz/A Targa @ 6-12 oz/A Mix with COC @ 1gal/100 gal or with NIS @ 1qt/100 gal Pump up sprayer: 1 tbsp herbicide + 2.5 tbsp COC or 2 tsp NIS	Annual and perennial grasses	Surfactant required; consult label for recommendations. Do not apply within 15 days of harvest. Maximum use rates are 14 oz./A/season. Check label for rates on specific weeds and weed sizes.
bentazon @ 0.5-1 lb/A	Basagran @ 1-2 pt/A	Common purslane, velvetleaf, common ragweed, mustard, wild sunflowers, smartweed, hairy nightshade, cocklebur, giant ragweed, prickly sida, yellow nutsedge, other broadleaf weeds.	Apply when weeds are small and actively growing after beans form two fully expanded trifoliolate leaves. Do not apply to beans that have been subjected to stress (hail, flooding, drought, injury from other herbicides or widely fluctuating temperatures). Rates highly depend on size and age of weeds. Check label for more specific rates. Do not apply within 30 days of harvest. Two applications 7-10 days apart may be required to control yellow nutsedge.
halosulfuron-methyl @ 0.024 to 0.036 lb/A	Sandea 75 DF or or Profine 75 DF @ 0.5 to 0.7 oz/A	No grass control Nutsedge and other broadleaf weeds	Apply after the 2- to 3-trifoliolate stage prior to flowering. May cause temporary stunting, which could delay maturity.
sethoxydim @ 0.1-0.47 lbs/A	Poast @ 0.75-2.5 pt/A Mix with COC @ 2 pt/A Pump up sprayer: 1/3-2 oz/gal Poast + 1.3 oz/A gal COC	Annual and perennial grasses	Apply to actively growing grasses before they exceed labeled heights. Do not apply within 15 days of harvest. Adjust pressure (40-60 psi), spray volume (5-20 GPA) and boom height to ensure thorough coverage. Do not apply more than 4 pt./A/year. Use caution when temperatures and relative humidity are high.

VEGETABLE WEED MANAGEMENT

SNAP AND LIMA BEANS^{3,4,5,6,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE continued:			
fomesafen @ 0.125-0.375 pt/A	Reflex 2 EC @ 0.5-1.5 pt/A Mix with NIS @ 1 qt/100 gal	Many broadleaf weeds	Apply to snap beans only. Snap beans should have at least 1 expanded trifoliate leaf. Total use cannot exceed 1.5 pt./A. Do not apply within 30 days of harvest. See label for further instructions and tank-mixes.
DIRECTED POSTEMERGENCE:			
carfentrazone-ethyl @ 0.012 – 0.024 lb/A	Aim 2EC @ .75-1.5 oz/A Aim 40 DF @ .33-1.0 oz/A Mix with NIS @ 2 pt/100 gal or COC @ 1 gal/100 gal	Most emerged broadleaf weeds; no grass control	Apply using hoods or shields. Crops contacted will be injured. Most effective on weeds less than 4 inches tall. Can be tank-mixed with other herbicides.
glyphosate @ 0.5-1.4 lbs/A	Roundup Weathermax @ 11-32 oz/A Various 4 L brands @ 16-45 oz/A Various 5 L brands @ 11-32 oz/A	Most emerged weeds	Apply to row middles using a hooded or shielded sprayer or a wiper applicator. To avoid injury keep herbicide off foliage, shoots, stems, exposed roots and fruit.

VEGETABLE WEED MANAGEMENT

BEET^{3,4,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREPLANT INCORPORATED:			
cycloate ² @ 3-4 lb/A	Ro-Neet 6-E @ 4.0 pt/A on light soil 4.7 pt/A on medium soil 5.3 pt/A on heavy soil	Many small-seeded annual grasses and broadleaf weeds	Incorporate thoroughly in top 2 inches of soil 5-7 days before planting.
PREEMERGENCE:			
pyrazon @ 3.2-3.7 lb/A	Pyramin DF @ 4.6 lb/A on light-med. soil 5.4 lb/A on heavy soil	Many small-seeded annual grasses and broadleaf weeds	Apply after planting before weeds emerge. If rainfall does not occur within 5-10 days after treatment, beets should be irrigated or shallowly cultivated.
cycloate @ 3-4 lb/A	Ro-Neet 6-E @ 4.0 pt/A on light soil 4.7 pt/A on medium soil 5.3 pt/A on heavy soil	Many small-seeded annual grasses and broadleaf weeds	Apply at planting. Incorporate thoroughly in top 2 inches of soil 5-7 days before planting to reduce risk of temporary crop injury.
POSTEMERGENCE:			
pyrazon @ 3.2-3.7 lb/A	Pyramin DF @ 4.6 lb/A on light-med. soil 5.4 lb/A on heavy soil	Many small-seeded annual grasses and broadleaf weeds	Apply after beets have 2 expanded true leaves and before any weeds have more than 2- to 4-true leaves.
sethoxydim @ 0.2-0.3 lb/A	Poast @ 1-1.5 pt/A Mix with COC @ 2 pt/A Pump up sprayer: 1.3-2 oz/gal Poast + 1.3 oz/A gal COC	Annual and perennial grasses	Apply to small actively growing grasses. Consult label for application timing. Do not apply within 60 days of harvest. Do not apply Poast on days that are unusually hot and humid. Adding COC to Poast may increase injury.
phenmedipham @ 0.5-1.0 lb/A	Spin-Aid @ 3-6 pt/A	Several broadleaf weeds	Apply when beets are past the 4- to 6-leaf stage and weeds are at the 2-leaf stage. Do not apply within 60 days of harvest.
clopyralid @ 0.187 lb/A	Stinger 3 EC @ 0.5 pt/A	Broadleaf weeds; controls most legumes	Apply to small actively growing weeds 30 days before harvest.
clethodim @ 0.094-0.125 lb/A	Select @ 6-8 oz/A Mix with COC @ 1 gal/100 gal Pump up sprayer: 0.33 to 0.66 oz/gal Select + 1.3 oz/gal COC	Annual and perennial grasses and annual bluegrass	Apply at to actively growing grasses. Do not apply more than 8 oz./A in a single application. Do not apply to stressed weeds or when rainfall is expected within 1 hour. Wait at least 14 days before repeating applications.
DIRECTED POSTEMERGENCE:			
carfentrazone-ethyl @ 0.012-0.024 lb/A	Aim 2 EC @ 0.75-1.5 oz/A Aim 40 DF @ 0.33-1.0 oz/A Mix with COC @ 1.3 oz/gal or NIS @ 0.33 oz/gal	Most emerged broadleaf weeds	Apply using hoods or shields. Will injure contacted crops. Most effective on small weeds. Can be mixed with other herbicides.

VEGETABLE WEED MANAGEMENT

BEET^{3,4,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
DIRECT POSTEMERGENCE continued:			
glyphosate @ 0.5-0.94 lb/A	Roundup Weathermax @ 11-22 oz/A Various 4 L brands @ 16-30 oz/A Various 5 L brands @ 11-24 oz/A	Most emerged weeds	To avoid severe crop injury, do not allow herbicide to contact foliage, green shoots, stems, exposed roots or fruit. Apply to row middles only with a hooded sprayer, shielded sprayer, or a wiper applicator. Do not apply within 14 days of harvest.
POSTHARVEST:			
glyphosate @ 0.5-0.94 lb/A	Roundup Weathermax @ 11-22 oz/A Various 4 L brands @ 16-30 oz/A Various 5 L brands @ 11-24 oz/A	Most emerged weeds	Apply after harvest is complete.

VEGETABLE WEED MANAGEMENT

COLE CROPS (Cabbage, Cauliflower, Broccoli, Brussels Sprouts)^{3,4,5,6}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREPLANT INCORPORATED:			
trifluralin ² @ 0.5-1.0 lb/A for transplants 0.5-0.75 lb/A for direct-seeded	Treflan HFP, Trifluralin, Trilin and other 4 EC products @ 0.75 or 1 pt/A on light soil 1.0 or 1.5 pt/A on med-heavy soil 60 DF products @ 0.6 or 0.8 lb/A on light soil 0.8 or 1.33 lb/A on med-heavy soil Use the lower rate on direct-seeded crops and the higher rate on transplants.	Small-seeded grasses, broadleaf weeds	Incorporate thoroughly in top 2 inches of soil just before transplanting or direct seeding. Direct-seeded crops exhibit marginal tolerance to trifluralin at rates higher than 0.5 lb. ai/A (1 pt/A). Stunting or reduced stands may occur. Do not exceed the 2 pt./A rate.
PREPLANT:			
oxyfluorfen @ 0.25-0.5 lb/A	Goal 1.6E or 2XL, Galligan @ 1.0 pt/A on coarse soil 2.0 pt/A on med to fine soil	Pennsylvania smartweed, pigweed, purslane and some grasses	Transplants only. Apply in at least 20 GPA. Do not exceed 40 psi pressure. Plant with minimal soil disturbance. May cause some leaf cupping.
DCPA @ 4.5-10.5 lbs/A	Dacthal 75WP @ 6-8 lb/A on light soil 8-10 lb/A on med soil 10-14 lb/A on heavy soil	Annual grasses and certain broadleaf weeds	On direct-seeded crops, apply just before planting in at least 20 gal. water/A. A minimum of 1/3-1/2 inch of water is necessary to activate within 3-5 days of application. If irrigation is unavailable, incorporate 1-2 inches to aid in weed control.
POSTEMERGENCE:			
sethoxydim @ 0.09-0.28 lb/A	Poast @ 0.5-1.5 pt/A Mix with COC @ 2 pt/A Pump up sprayer: 1.3-2 oz/gal Poast + 1.3 oz/A gal COC	Annual and perennial grasses	Do not use on Brussels sprouts. Apply to small actively growing grasses; see label. Do not apply within 30 days of harvest. Adjust pressure (40-60 psi), spray volume (5-20 GPA), and boom height to ensure thorough coverage. Do not apply more than 3 pt./A/year. Rainfast in 1 hour.
clethodim @ 0.1-0.125 lb/A	Select @ 6-8 oz/A Mix with COC at 1 gal/100gal Pump up sprayer: 0.33 to 0.66 oz/gal Select + 1.3 oz/gal COC	Annual and perennial grasses	Suggested for direct-seeded crops. Do not use on Brussels sprouts. Apply to actively growing grasses. For repeat applications, make on a minimum of 14-day intervals. Rainfast in 1 hour. Do not apply within 30 days of harvest. Do not apply more than 8 oz./A in a single application.
clopyralid @ 0.9-0.187 lbs/A	Stinger 3 EC @ 0.25-0.5 pt/A	Broadleaf weeds, including clover	Suggested for direct-seeded crops. Do not use on Brussels sprouts. Apply when weeds are small and actively growing. Do not apply within 30 days of harvest.

VEGETABLE WEED MANAGEMENT

COLE CROPS (Cabbage, Cauliflower, Broccoli, Brussels Sprouts)^{3,4,5,6}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
DIRECTED POSTEMERGENCE:			
glyphosate @ 0.5-0.94 lb/A	Roundup Weathermax @ 11-22 oz/A	Most emerged weeds	Suggested for direct-seeded crops. Do not use on Brussels sprouts. To avoid severe crop injury, do not allow herbicide to contact foliage, green shoots, stems, exposed roots or fruit. Apply to row middles only with a hooded sprayer, shielded sprayer or a wiper applicator. Do not apply within 14 days of harvest.
	Various 4 L brands @ 16-30 oz/A Various 5 L brands @ 11-24 oz/A		
carfentrazone-ethyl @ 0.012-0.024 lb/A	Aim 2 EC @ 0.75-1.5 oz/A Aim 40 DF @ 0.33-1.0 oz/A	Most emerged broadleaf weeds	Do not use on Brussels sprouts. Apply using hoods or shields. Will injure contacted crops. Most effective on small weeds. Can be mixed with other herbicides.
	Mix with COC @ 1.3 oz/gal or NIS @ 0.33 oz/gal	No grass control	

VEGETABLE WEED MANAGEMENT

CARROT^{3,4,5}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREPLANT INCORPORATED:			
trifluralin ² @ 0.5-1 lb/A	Treflan HFP, Trifluralin, Trilin and other 4 EC products @ 1 pt/A on light soil 1.5 pt/A on medium soil 2 pt/A heavy soil 60 DF products @ 0.875 lb/A on light soil 1.33 lb/A on medium soil 1.6 lb/A on heavy soil	Small-seeded grasses, broadleaf weeds and seedling johnsongrass	Incorporate thoroughly in top 2 inches of soil just before planting.
PREEMERGENCE:			
linuron @ 0.5-1.5 lb/A	Lorox DF @ 1.5 lb/A on light soil 2-2.5 lb/A on medium soil 3.0 lb/A on heavy soil	Broadleaf weeds, some grasses and yellow nutsedge	Apply after planting before carrots or weeds emerge. Plant seed 1/2 inch deep. Be aware of replant restrictions.
POSTEMERGENCE:			
linuron @ 0.5-1.5 lb/A	Lorox DF @ 1.5 lb/A on light soil 2-2.5 lb/A on medium soil 3.0 lb/A on heavy soil	Broadleaf weeds, some grasses and yellow nutsedge	Apply after carrots are at least 3 inches tall and before grasses are 2 inches and broadleaves are 6 inches. Do not tank-mix with other pesticides. Be aware of replant restrictions.
fluazifop @ 0.1-0.375 lb/A	Fusilade DX @ 0.375-1.5 pt/A Mix 6-12 oz of Fusilade with 1-2 pt COC or 0.5-1 pt NIS in 25 gal of water.	Annual and perennial grasses	Apply to actively growing grasses before they exceed the labeled growth stages. Use sufficient spray volume (5-40 gal./A) and pressure (40-60 psi) to ensure adequate coverage. Do not harvest carrots within 45 days after application. Maximum use rate is 48 oz./A/season. Do not apply to stressed grasses or when rainfall is expected within 1 hour.
sethoxydim @ 0.09-0.47 lb/A	Poast @ 0.5-2.5 pt/A Mix with 2 pt/A COC Pump up sprayer: 1.3-2 oz/gal Poast + 1.3 oz/gal COC	Annual and perennial grasses	Apply before grasses exceed height labeled heights. Adjust pressure (40-60 psi), spray volume (5-20 gal./A) and boom height to aid in coverage. Do not apply within 30 days of harvest. Maximum use rate is 3 pt./A. Rainfast in 1 hour.
clethodim @ 0.1-0.125 lb/A	Select @ 6-8 oz/A Mix with COC @ 1 gal/100 gal Pump up sprayer: 0.33 to 0.66 oz/gal Select + 1.3 oz/gal COC	Annual and perennial grasses and annual bluegrass	Apply postemergence to actively growing grasses. Do not apply under stressed conditions or if rainfall is expected within 1 hour. Do not apply within 30 days of harvest. Do not apply more than 8 oz./A in a single application. For repeat applications, make on a minimum of 14-day interval.

VEGETABLE WEED MANAGEMENT

CARROT^{3,4,5}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE continued:			
metribuzin @ 0.25 lb/A	Sencor FL @ 0.5 pt/A Sencor DF @ 0.33 lb/A	Many broadleaf weeds	Apply after carrots reach the 5- to 6-leaf stage but before weeds are 1 inch high. Do not apply within 3 days after a period of cool, wet or cloudy weather or crop injury will occur. Second application can be made after an interval of at least 3 weeks. At least 60 days to harvest. Check label for crop rotation.
Stoddard solvent	Varsol @ 40-60 gal/A	Many annual grasses and broadleaf weeds	Do not apply later than 6 weeks before harvest. Apply before weeds are 1 inch tall. Works best on warm sunny days.
DIRECTED POSTEMERGENCE:			
glyphosate @ 0.5-0.94 lb/A	Roundup Weathermax @ 11-22 oz/A Various 4 L brands @ 16-30 oz/A Various 5 L brands @ 11-24 oz/A	Most emerged weeds	Apply to row middles only using a hooded sprayer, shielded sprayer, or a wiper applicator. Also may be used after harvest. To avoid severe crop injury do not allow herbicide to contact foliage, green shoots, stems, exposed roots or fruit. Do not apply within 14 days of harvest.
pendimethalin @ 1lb/A	Prowl H2O @ 2 pt/A	Annual grasses and broadleaf weeds	May be applied as a directed spray to the soil between rows after the last mechanical cultivation. DO NOT ALLOW THE SPRAY TO CONTACT THE CARROT PLANTS OR INJURY MAY OCCUR. Do not apply more than 2.0 pt./A per season. Apply at least 60 days before harvest. Do not feed forage or graze livestock in treated fields.

VEGETABLE WEED MANAGEMENT

SWEET CORN^{3,4}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREPLANT/PREPLANT INCORPORATED:			
atrazine @ 1-2.0 lb/A	4L formulations @ 2 pt/A on coarse soil 3 pt/A on medium soil 4 pt/A on fine soil Multiply the 4 L rate by 0.8 when using a 5 L atrazine. 80 DF formulations @ 1.25 lbs/A on coarse soil 1.90 lbs/A on medium soil 2.50 lbs/A on fine soil Multiply the 80 DF rate by 0.88 when using a 90 DF atrazine.	Many small seeded annual grasses and broadleaf weeds	Apply to surface of freshly moist cultivated soil. Do not plant treated areas with any crop except corn or grain sorghum until the following year. Do not apply more than 2.0 lb. ai/A per application or 2.5 lb. ai/year. Check label for tank-mixes with other herbicides. Do not mix, load or use within 50 ft. of a well. Use a device to prevent back siphoning when mixing.
S-metolachlor @ 1.25-1.56 lb/A + atrazine @ 1.63-2.0 lb/A	Bicep II Magnum @ 2.1-2.6 qt/A	Most small-seeded annual grasses and broadleaf weeds.	See comments for atrazine and S-metolachlor. Do not exceed more than 2.0 lb. ai/A atrazine per application (2.6 qt./A Bicep II or 3 qt./A Bicep Lite). Bicep Lite at 3 qt./A would injure corn. The maximum use rate for atrazine is 2.5 lb. ai/A/year. Use Bicep Lite if another atrazine application is expected.
S-metolachlor @ 1.25-1.83 lb/A + atrazine @ 1-1.5 lb/A	Bicep Lite II Magnum @ 1.5 to 2.2 qt/A		
alachlor @ 2-4 lb/A	Lasso 4EC or MT @ 4 pt/A on light soil 6 pt/A on medium soil 8 pt/A on heavy soil Partner WDG @ 3 lb/A on light soil 4 lb/A on medium soil 6 lb/A on heavy soil	Many small-seeded annual grasses and broadleaf weeds	Apply to surface of freshly cultivated soil. Do not forage or harvest immature corn within 12 weeks after treatment. Check label for tank-mixes with other herbicides.
alachlor @ 1.56-2.81 lb/A + atrazine @ 0.94-1.69 lb/A	Bullet @ 2.5 qt/A on coarse soil 3.5 qt/A on medium soil 4.0-4.5 qt/A on fine soil	Many small-seeded annual grasses and broadleaf weeds	See comments for atrazine. Do not exceed more than 2.0 lb. ai/A atrazine per application (5.33 qt./A of Bullet). The maximum use rate for atrazine is 2.5 lb. ai/A/year. Do not exceed 6.4 qt. of Bullet/A per year.
PREEMERGENCE:			
S-metolachlor @ 0.95 – 1.91	Dual Magnum, Dual II Magnum @ 1-2 pt/A	Most annual grasses and pigweed	Apply to soil surface immediately after planting. Consult labels for approved tank-mixes.
metolachlor @ 0.98-1.63 lbs/A	Medal, Stalwart, Parallel, Charger @ 1.0-1.3 pt/A on coarse soil @ 1.3-1.67 pt/A on med.-fine soil	Most annual grasses and pigweed	Apply to soil surface immediately after planting. Consult labels for approved tank-mixes.
dimethenamid @ 0.94 -1.5 lb/A	Outlook @ 8-12 oz/A on coarse-med. soil 12-16 oz/A on fine soil	Most annual grasses, pigweeds and some sedges	Apply to soil surface immediately after planting. Check with seed supplier for varietal tolerance. Consult label for approved tank-mixes.

VEGETABLE WEED MANAGEMENT

SWEET CORN^{3,4}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE continued:			
atrazine @ 1-2.0 lb/A	Same as above.	Same as above	Apply after planting before crop and weeds emerge. See additional comments above.
S-metolachlor @ 1.25-1.56 lb/A + atrazine @ 1.63-2.0 lb/A	Bicep II Magnum @ 2.1-2.6 qt/A	Most small-seeded annual grasses and broadleaf weeds	See comments for atrazine and S-metolachlor. Do not exceed more than 2.0 lb. ai/A atrazine per application (2.6 qt./A Bicep II or 3 qt./A Bicep Lite). The S-metolachlor rate in 3 qt./A Bicep Lite would injure corn. The maximum use rate for atrazine is 2.5 lb. ai/A/year. Use Bicep Lite if another atrazine application is expected.
S-metolachlor @ 1.25-1.83 lb/A + atrazine @ 1-1.5 lb/A	Bicep Lite II Magnum @ 1.5-2.2 qt/A		
alachlor @ 2-4 lb/A	Lasso 4EC or MT @ 4 pt/A on light soil 6 pt/A on medium soil 8 pt/A on heavy soil Partner WDG @ 3 lb/A on light soil 4 lb/A on medium soil 6 lb/A on heavy soil	Many small-seeded annual grasses and broadleaf weeds	Apply after planting before weeds and corn emerge. Do not forage or harvest immature corn within 12 weeks after treatment. Check label for tank-mixes with other herbicides.
alachlor @ 1.56-2.81 lb/A + atrazine @ 0.94-1.69 lb/A	Bullet @ 2.5 qt/A on coarse soil 3.5 qt/A on medium soil 4.0-4.5 qt/A on fine soil	Many small-seeded annual grasses and broadleaf weeds	Apply after planting before weeds and corn emerge. See comments for atrazine and alachlor. Do not exceed 6.4 qt. of Bullet/A per year.
POSTEMERGENCE:			
dimethenamid @ 0.94 -1.5 lb/A	Outlook @ 8-12 oz/A on coarse-med. soil 12-16 oz/A on fine soil	Most annual grasses, pigweeds and some sedges	Apply early postemergence before corn reaches 8 inches tall and weeds exceed the 2-leaf stage. Check with seed supplier for varietal tolerance. Consult label for approved tank-mixes.
atrazine @ 1-2.0 lb/A	Rates as above. Apply with 1 pt/25 gal NIS or 1 qt/25 gal COC	Many small-seeded annual grasses and broadleaf weeds	Apply before corn is 12 inches tall and pigweeds reach 6 inches and before other broadleaf weeds reach 4 inches and grasses reach 1.5 inches. Do not apply when crop is under stress from prolonged wet or cold weather, poor fertility, is wet and succulent following a recent rain, or other factors. See additional comments above.
S-metolachlor @ 0.96-1.56 lb/A + atrazine @ 1.25-2.0 lb/A	Bicep II Magnum @ 1.6-2.6 qt/A	Most small-seeded annual grasses and broadleaf weeds	Apply before weeds exceed the 2-leaf stage and corn exceeds 5 inches. See comments for atrazine and S-metolachlor. Do not exceed more than 2.0 lb. ai/A atrazine per application (2.6 qt./A Bicep II or 3 qt./A Bicep Lite). The S-metolachlor rate in 3 qt./A Bicep Lite would injure corn. The maximum use rate for atrazine is 2.5 lb. ai/A/year. Use Bicep Lite if another atrazine application is expected.
S-metolachlor @ .91-1.58 lb/A + atrazine @ 0.73-1.26 lb/A	Bicep Lite II Magnum @ 1.1-1.9 qt/A		

VEGETABLE WEED MANAGEMENT

SWEET CORN^{3,4}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE continued:			
bentazon @ 0.75-1.0 lb/A	Basagran @ 1.5-2 pt/A Mix with COC in some situations; consult label.	Many broadleaf weeds including annual morningglory, cocklebur, velvetleaf, Pennsylvania smartweed, prickly sida, dayflower, ragweed and yellow nutsedge No grass control	Apply to small, actively growing weeds. Two applications of 5-14 days apart may be necessary to control morningglories at the 4-leaf and 4-inch-tall stage. Addition of COC will increase control of morningglory, velvetleaf and ragweed. Check label for tank-mixes with other herbicides. Do not apply more than 4 pt./A per season.
halosulfuron @ 0.032 lb/A	Sandea 75 DF, Profine 75 DF Sempra 75 DF @ 0.66 oz/A Apply with NIS @ 1-2 pt/100 gal. of water or COC @ 1 gal/100 gal. of water	Nutsedge and some broadleaf weeds	User assumes all responsibility for use on sweet corn. May be applied over the top or with drop nozzles from spiking to layby. A sequential treatment of 0.66 oz./A directed to avoid application in the whorl may be made. Avoid cultivation for 7 days after application. Consult label for plant back restrictions. No more than 2 applications per season. Do not apply to crops under stress. Check label for weed stage development. Do not harvest within 30 days of application.

VEGETABLE WEED MANAGEMENT

CUCURBITS (Cucumber, Squash, Watermelon, Pumpkin, Cantaloupe)^{4,5,6,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE:			
ethalfluralin @ 1.13-1.7 lb/A	Curbit EC @ 3 pt/A on coarse soil 3-4 pt/A on medium soil 4-4.5 pt/A on fine soil	Certain annual grasses and broadleaf weeds Replant only crops listed on the Curbit or other ethalfluralin labels	Apply after planting before crop and weeds emerge. Band between rows after transplanting or seeded crop emerge. Do not use under or over row covers, hot caps, plastic mulch or other plant covers. Under cool weather that can delay early seedling emergence or growth (first planting of the season), Curbit can cause injury or crop failure. Crop residue, weeds, cloddy conditions and wet soils may interfere with Curbit performance. Must be activated with 5 days with a 1/2 inch of rainfall or irrigation.
halosulfuron @ 0.024 - 0.36 lb/A	Sandea 75 DF or Profine 75 DF @ 0.5-0.75 oz/A	Nutsedge and some broadleaf weeds	Cucumbers and cantaloupe only. Apply after planting before weeds and crop emerge. Also can be applied 7 days prior to transplanting. May be applied as an under plastic mulch. Apply following final bed shaping and just prior to laying plastic. Wait 7 days after application to plant.
ethalfluralin @ 0.4-1.2 lb/A + clomazone @ 0.125 – 0.325 lb/A	Strategy 2.1L @ 2.6 pt/A	Annual grasses and broadleaf weeds	Apply after seeding. Do not apply prior to planting. Do not incorporate. May be applied in row middles.
clomazone @ 0.15 – 0.375 lb/A	Command 3ME @ 0.40 – 1.00 pt/A	Annual grasses and broadleaf weeds with some cocklebur control.	Apply to after planting. Foliar contact with drift or vapors may whiten plants. Symptoms are generally temporary, but may persist on some plants. Don't apply within 1,200 feet of sensitive areas; consult label. Rotation to all is 12 months. May be mixed with other herbicides. Some varieties may be sensitive; consult label. Don't use on Jack-O-Lantern or squash.
terbacil @ 0.1-0.2 lb/A	Sinbar 80 WP @ 2-4 oz/A	Broadleaf weeds	For use on watermelons only. Apply before crop or weeds emerge or apply before transplanting. Can be applied under plastic or to row middles. Can be applied over plastic mulch before punching holes. However, a 1/2-inch rain is required to wash off Sinbar before holes are punched or transplanted.
POSTEMERGENCE:			
clethodim @ 0.1 - 0.125 lb/A	Select Max @ 9-16 oz/A Arrow @ 6-8 oz/A Apply with COC @ 1 gal/100 gal Pump up sprayer: 0.33 to 0.66 oz/gal clethodim + 1.3 oz/gal COC	Annual and perennial grasses	May also be applied to musk melons. Apply before grasses exceed recommend height; consult label. Do not apply under stressed conditions. Rain-fast in 1 hour. May be applied a minimum of 30 days before harvest. Don't apply more than 8 oz./A/application. Allow 14 days between applications.

VEGETABLE WEED MANAGEMENT

CUCURBITS (Cucumber, Squash, Watermelon, Pumpkin, Cantaloupe)^{4,5,6,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE continued:			
halosulfuron @ 0.024 - 0.36 lb/A	Sandea 75 DF or Profine 75 DF @ 0.5-0.75 oz/A Apply with NIS @ 1 qt/ 100 gal of water	Yellow and purple nutsedge and some broadleaf weeds.	Cucumbers and cantaloupe only. Overtop application 14 days after transplanting. Avoid overtop application when temperature or humidity are high. Can be applied as a direct spray to row middles. Thirty days to harvest cucumbers; 57 days to harvest cantaloupes. See label for crop rotation intervals. DO NOT apply more than 2 oz./A in a 12-month period. May also be applied to musk melons . Apply before grasses exceed recommend height; consult label. Adjust pressure (40-60 psi), spray volume (5-20 GPA) and height of spray boom to ensure thorough coverage. Do not apply Poast within 14 days of harvest. Do not apply more than 3 pt./A/season. Poast plus COC should be used with caution when temperatures exceed 90 F and the relative humidity is 60% or higher because of potential leaf injury. Rainfast in 1 hour. Do not apply to grasses under stress.
sethoxydim @ 0.09-0.28 lbs/A	Poast @ 0.5-1.5 pt/A Apply with COC @ 2 pt/A Pump up sprayer: 1.3-2 oz/gal Poast+ 1.3 oz/A COC/gal	Annual and perennial grasses	
DIRECTED POSTEMERGENCE:			
glyphosate @ 0.5-0.94 lb/A	Roundup Weathermax @ 11-22 oz/A Various 4 L brands @ 16-30 oz/A Various 5 L brands @ 11-24 oz/A	Most emerged weeds	Apply to row middles only using a hooded sprayer, shielded sprayer or a wiper applicator. Also may be used after harvest. To avoid severe crop injury, do not allow herbicide to contact foliage, green shoots, stems, exposed roots or fruit. Do not apply within 14 days of harvest.
halosulfuron @ 0.12- 0.18 lb/A	Sandea 75 DF or Profine 75 DF @ 0.5-1.0 oz/A	Nutsedge and some broadleaf weeds	Apply to row middles. For use in watermelons, pumpkins or squash only.
trifluralin ² @ 0.5-1lb/A	Treflan HFP, Trifluralin, Trilin and other 4 EC products @ 1 pt/A on light soil 1.5 pt/A on medium soil 2 pt/A heavy soil 60 DF products @ 0.875 lb/A on light soil 1.33 lb/A on medium soil 1.6 lb/A on heavy soil	Small-seeded grasses, broadleaf weeds and seedling johnsongrass	For use only on cucumbers, watermelons and cantaloupes. Direct spray to row middles and/or beneath plants at the 3- to 4-true-leaf stage. Incorporate within 24 hrs; adjust equipment to move treated soil around the base of plants. Do not harvest cucumbers or cantaloupes within 30 days or watermelons within 60 days. Do not apply over the top of plants.
carfentrazone-ethyl @ 0.012 – 0.024 lb/A	Aim 2 EC @ 0.75-1.5 oz/A Aim 40DF @ @ .33-1.0 oz/A Apply with NIS @ 2 pt/100 gal or COC at 1 gal/100 gal	Most emerged broadleaf weeds No grass control	Do not use on squash. Apply postemergence directed using hoods. Spray will injure crop. Most effective when weeds are less than 4 inches tall. Good coverage equals good weed control. Can be mixed with other herbicides to control grasses.

VEGETABLE WEED MANAGEMENT

CUCURBITS (Cucumber, Squash, Watermelon, Pumpkin, Cantaloupe)^{4,5,6,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
DIRECTED POSTEMERGENCE continued:			
ethalfluralin @ 0.4-1.2 lb/A clomazone @ 0.125-0.325lb/A	Strategy @ 2.1 L 2-3 pt/A	Annual grasses and broadleaf weeds	Cucumbers, cantaloupes pumpkins watermelons, squash. May be applied post-directed spray to row middles after crop emergence or transplanting. Do not apply over plants. Preemergence activity on weeds only.

VEGETABLE WEED MANAGEMENT

EGGPLANT^{4,6,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREPLANT/PRE-TRANSPLANT:			
napropamide @ 1-2 lb/A	Devrinol 50DF @ 2 lb/A on light soil 3 lb/A on medium soil 4 lb/A on heavy soil	Certain annual grasses and broadleaves	Apply before transplanting; can only be used on transplants. Incorporate 1- to 2-inches deep soon after application. Spray soil strip between rows of plastic after laying the mulch.
trifluralin ² @ 0.5-1 lb/A	Treflan HFP, Trifluralin, Trilin and other 4 EC products @ 1 pt/A on light soil 1.5 pt/A on medium soil 2 pt/A heavy soil 60 DF products @ 0.875 lb/A on light soil 1.33 lb/A on medium soil 1.6 lb/A on heavy soil	Small-seeded grasses, broadleaf weeds and seedling johnsongrass	Incorporate thoroughly in the top 2 inches of soil just before transplanting. Avoid transplanting until temperatures have warmed in the spring. Eggplant tolerance may be marginal. Use with caution.
POSTEMERGENCE/POST-TRANSPLANT:			
sethoxydim @ 0.188-0.28 lbs/A	Poast @ 0.5-1.5 pt/A Apply with COC @ 2 pt/A Pump up sprayer: 1.3-2 oz/gal Poast + 1.3 oz/gal COC	Annual and perennial grasses	Apply to actively growing grasses before they exceed labeled heights; consult label. Adjust equipment to ensure good coverage. Apply a minimum 20 days before harvest. Maximum use rate is 4.5 pt./A/yr. Rainfast in 1 hour. Poast plus COC may cause leaf burn.
clethodim @ 0.1 - 0.125 lb/A	Select @ 6-8 oz/A Apply with COC @ 1 gal/100 gal Pump up sprayer: 0.33 to 0.66 oz/gal Select + 1.3 oz/gal COC	Annual and perennial grasses	Apply to actively growing grasses before they exceed labeled heights; consult label. 20 days before harvest. Max use rate is 8 oz./A/application. Rainfast in 1 hour. Allow 14days between applications.
DIRECTED POSTEMERGENCE/DIRECTED POST-TRANSPLANT:			
paraquat @ 0.49 lb/A	Gramoxone Inteon @ 2 pt/A Firestorm, Parazone @ 1.7-2.7 pt/A Mix with NIS @ 1 pt/100 gal or COC @ 1 gal/100 gal Pump up sprayer: 0.33 oz/gal paraquat + 0.33-0.5 oz/gal NIS or 1.3 oz/gal COC.	Emerged small annual broadleaf weeds and grasses; top kill and suppression of perennials	Apply after transplanting as a directed spray between rows. Use shields to protect crop. Use 20-100 GPA. Do not exceed 30 psi nozzle pressure or spray under conditions that favor drift. Apply when weeds and grasses are 1-6 inches high. Apply a minimum of 30 days to harvest. Do not exceed 3 applications per season. Do not feed or graze treated areas.

VEGETABLE WEED MANAGEMENT

EGGPLANT^{4,6,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
DIRECTED POSTEMERGENCE/DIRECTED POST-TRANSPLANT continued:			
glyphosate @ 0.5-0.94 lb/A	Roundup Weathermax @ 11-22 oz/A	Most emerged weeds	Apply to row middles only using a hooded or shielded sprayer or a wiper applicator. Also may be used postharvest. To avoid severe injury to crop, do not allow herbicide to contact foliage, green shoots, stems, exposed roots or fruit. Do not apply within 14 days of harvest.
	Various 4 L brands @ 16-30 oz/A Various 5 L brands @ 11-24 oz/A		
halosulfuron @ 0.12 – 0.18 lb/A	Sandea 75 DF or Profine 75 DF @ 0.5-1.0 oz/A	Nutsedge and some broadleaf weeds	Apply to row middles; avoid contact with crop and plastic. Do not apply within 30 days of harvest. Long residual. Check label for recrop intervals. Do not apply more than 2 oz./A/year.
carfentrazone-ethyl @ 0.012 – 0.024 lb/A	Aim 2 EC @ .75-1.5 oz/A Aim 40 DF @ .33-1.0 oz/A	Most emerged broadleaf weeds	Apply as directed spray using hoods. Injury will occur if crop is sprayed. Most effective when weeds are less than 4 inches tall. Good coverage equals good weed control.
	Apply with NIS @ 2 pt/100 gal or COC @ 1 gal/100 gal	No grass control; can be mixed with grass herbicides	

VEGETABLE WEED MANAGEMENT

GREENS (Collard, Mustard, Turnip)^{3,4,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREPLANT INCORPORATED:			
trifluralin ² @ 0.5-.75 lb/A	Treflan HFP, Trifluralin, Trilin, and other 4 EC products @ 1 pt/A on light soil 1.5 pt/A on med.-heavy soil 60 DF products @ 0.8 lb/A on light soil 1.33 lbs/A on med.-heavy soil	Small-seeded annual grasses, broadleaf weeds and seedling johnsongrass	Incorporate thoroughly in top 2 inches of soil just before planting.
POSTEMERGENCE:			
sethoxydim @ 0.09-0.28 lbs/A	Poast @ 0.5-1.5 Apply with COC @ 2 pt/A Pump up sprayer: 1.3-2 oz/gal Poast + 1.3 oz/gal COC	Annual and perennial grasses	Do not use on turnips. Apply to actively growing grasses before they exceed recommended heights. Adjust equipment to ensure good coverage. 20 days before harvest. Maximum use rate is 4.5 pt./A/yr. Rainfast in 1 hour. Poast plus COC may cause leaf burn. Use with caution when temperatures exceed 90 F and the relative humidity is 60% or higher, or when temperatures reach 100 F.
clethodim @ 0.1 - 0.125 lb/A	Select Max @ 9-16 oz/A Arrow @ 6-8 oz/A Apply with COC @ 1 gal/100 gal Pump up sprayer: 0.33 to 0.66 oz/gal clethodim+1.3 oz/gal COC	Annual and perennial grasses	Apply to actively growing grasses before they exceed recommended heights; consult label. Do not apply within 14 days of harvesting leaves or 30 days of harvesting the root. Maximum use rate is 8 oz./A/application. Rainfast in 1 hour.
clopyraild @ 0.187 lb/a	Stinger 3 ED 0.3-0.5 pt/a	Clover, legumes and other broadleaf weeds	Apply to crop when weeds are small and actively growing. Apply at least 30 days before harvest for mustard, collards, turnips roots, kale and 15 days before harvest for turnip tops. Mustard greens injury has been observed in some trials.
DIRECTED POSTEMERGENCE:			
carfentrazone-ethyl @ 0.012 – 0.024 lb/A	Aim2 EC @ .75-1.5 oz/A Aim 40 DF @ .33-1.0 oz/A Apply with NIS @ 2 pt/100 gal or COC @ 1 gal/100	Most emerged broadleaf weeds No grass control; can be mixed with grass herbicides	Direct application using a hooded sprayer. Spray will injure crop. Most effective when weeds are less than 4 inches tall. Good coverage equals good control.
glyphosate @ 0.5-0.94 lb/A	Roundup Weathermax @ 11-22 oz/A Various 4 L brands @ 16-30 oz/A Various 5 L brands @ 11-24 oz/A	Most emerged weeds	Not labeled for turnip. Apply to row middles only using a hooded or shielded sprayer or a wiper applicator. Also may be used post-harvest. To avoid severe injury to crop, do not allow herbicide to contact foliage, green shoots, stems, exposed roots or fruit. Do not apply within 14 days of harvest.

VEGETABLE WEED MANAGEMENT

GARLIC^{3,5,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE:			
oxyfluorfen @ 0.25-0.5 lb/A	Goal 1.6E @ 1.25-2.5 pt/A Goal 2XL, Galligan 2 EC @ 1-2 pt/A	Annual broadleaf weeds	Apply a single application within 2 days of planting for preemergence control. See postemergence section of product label for additional comments.
pendimethalin @ 0.5-1.5 lbs/A	Prowl 3.3, Pendimax 3.3 @ 1.2-1.8 pt/A on light soil 1.8-2.4 pt/A on med. soil 1.8-3.6 pt/A on heavy soil Prowl H2O @ 1-1.6 pt/A on light soil 1.6-2.1 pt/A on med. soil 2.1-3.2 pt/A on heavy soil Pentagon DG @ 0.5-1.25 lb/A on light soil 1.25-1.7 lb/A on med. soil 1.25-2.5 lb/A on heavy soil	Many small-seeded grasses and broadleaves, including annual spurge	Apply after planting before weeds and crop emerge. Treatment most effective when rainfall or overhead irrigation is received within 7 days after application. May be applied as split application both preemergence and postemergence.
flumioxazin @ 0.188 lb/a	Chateau 51 WDG @ 6 oz/a	Annual grasses and broadleaf weeds	Application can be made within 3 days after planting. Apply prior to garlic and weed emergence. Do not apply more than 6 oz./A/growing season.
POSTEMERGENCE:			
bromoxynil @ 0.375-0.5	Buctril 2EC, Moxy 2EC @ 1.5-2 pt/A Buctril 4EC @ 0.75-1 pt/A	Many broadleaf weeds	Apply when garlic has 1- to 2-true-leaf stage and less than 12 inches tall and weeds are 1-4 inches tall. Use a minimum spray volume of 20 gal./A. Do not apply within 112 days to harvest. Do not add surfactants. Use lower rate on small weeds and the higher rate on 4 inches weeds. Do not apply more than 0.5 lb. ai/A/season.
fluzifop @ 0.1-0.375 lb/A	Fusilade DX @ 0.375-1.5 pt/A Apply with COC @ 1-2 pt/25 gal or NIS @ 0.5-1 pt/25 gal Pump up sprayer: 0.75 oz/gal Fusilade + 1.5 oz/gal COC or 0.5 oz/gal NIS	Annual and perennial grasses	Apply to actively growing grasses before they exceed the labeled heights; consult label. Use sufficient spray volume (5-40 GPA) and pressure (40-60 psi) to ensure complete coverage. Do not harvest garlic within 45 days after application. Do not apply a total of more than 48 oz./A of Fusilade DX per acre per season. Do not apply to grasses that are drought-stressed. Do not apply if rainfall is expected within 1 hour.
dimethenamid-P @ 0.60-1.0 lb/A	Outlook 6 EC @ 12 – 21 oz/A	Annual grasses and pigweed	Apply after the crop has reached the 2-true-leaf stage until a minimum of 30 days till harvest. Application made prior to the 2-true-leaf stage may result in significant crop injury including possible stand reduction.

VEGETABLE WEED MANAGEMENT

GARLIC^{3,5,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE continued:			
clethodim @ 0.1-0.125 lb/A	Select 2EC, Arrow @ 6-8 oz/A Select Max @ 9-16 oz/A Apply with COC @ 1 gal/100 gal Pump up sprayer: 0.33 to 0.66 oz/gal clethodim+1.3 oz/gal COC	Annual and perennial grasses	Apply to actively growing grasses. Rates vary by grass species, stage and region. Do not apply under stressed conditions. Rainfast in 1 hour. May be applied a minimum of 45 days before harvest. Do not apply more than 0.5 lb. ai/A/year. Apply in a minimum of 20 GPA.
sethoxydim @ 0.1-0.3 lbs/A	Poast @ 0.5-1.5 pt/A Apply with COC @ 2 pt/A Pump up sprayer: 1.3-2 oz/gal Poast + 1.3 oz/gal COC	Annual and perennial grasses	Apply to actively growing grasses before they exceed recommended heights. Adjust equipment to ensure good coverage 45 days before harvest. Maximum use rate is 3 pt./A/yr. Use with caution when temperatures exceed 90 F and the relative humidity is 60% or higher or when temperatures reach 100 F.
oxyfluorfen @ 0.12 lb/A	Goal 1.6E @ 9.6 oz/A Goal 2XL, Galligan 2 EC @ 7.6 oz/A	Annual broadleaf weeds	Apply after garlic has 2-true leaves and weeds are in the 2- to 4-true-leaf stage. Some garlic injury may result. Injury may be severe if applied under cool, wet conditions. Do not make more than 4 applications per year. Do not apply within 60 days of harvest.
pendimethalin @ 0.5-1.5 lbs/A	Prowl 3.3, Pendimax 3.3 @ 1.2-1.8 pt/A on light soil 1.8-2.4 pt/A on med. soil 1.8-3.6 pt/A on heavy soil Prowl H2O @ 1-1.6 pt/A on light soil 1.6-2.1 pt/A on med. soil 2.1-3.2 pt/A on heavy soil Pentagon DG @ 0.5-1.25 lb/A on light soil 1.25-1.7 lb/A on med. soil 1.25-2.5 lb/A on heavy soil	Many small-seeded grasses and broadleaves, including annual spurge	Apply to garlic with 1-5 leaves. Treatment most effective when rainfall or overhead irrigation is received within 7 days after application. May be applied as split application both preemergence and postemergence. Garlic treated postemergence should not be harvested within 45 days after application.
DIRECTED POSTEMERGENCE:			
carfentrazone-ethyl @ 0.012-0.024 lb/A	Aim 2 EC @ 75-1.5 oz/A Aim 40 DF @ 0.33-1.0 oz/A Apply with NIS @ 2 pt/100 gal or COC @ 1 gal/100	Most emerged broadleaf weeds No grass control, but can be mixed with grass herbicides	Direct applications using hooded sprayers. Injury will occur if crop is sprayed. Most effective on weeds less than 4 inches tall. Coverage is critical to weed control.
glyphosate @ 0.5-0.94 lb/A	Roundup Weathermax, other 5L brands @ 11-22 oz/A Various 4 L brands @ 16-30 oz/A	Most emerged weeds	Apply to row middles using only a hooded or shielded sprayer or a wiper applicator. Also may be used post-harvest. Avoid crop injury by keeping herbicide off foliage, green shoots, stems, exposed roots or fruit.

VEGETABLE WEED MANAGEMENT

LEAFY VEGETABLES (Lettuce, Endive, Escarole, Radicchio)^{3,4,6,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREPLANT/PREPLANT INCORPORATED:			
benefin @ 1.12-1.5 lb/A	Balan DF @ 2.0 lbs/A on coarse-med soil 2.5 lbs/A on fine soil	Annual grasses and broadleaf weeds	Lettuce and endive: Incorporate into the top 2-3 inches of the final seed bed before seeding or transplanting. Check label for further information.
pronamide @ 1-2 lbs/A	Kerb 50-WP @ 2.0-3.0 lbs/A on coarse-med soil 3.0-4.0 lbs/A on fine soil	Annual grasses and broadleaves	Lettuce, endive & escarole: Necessary to move herbicides into the root zone of germinating weeds by overhead sprinkler irrigation or rainfall 2-3 days after application. Can be incorporated shallowly and thoroughly before planting. Check rotation restrictions. Make only one application/year.
bensulide @ 5-6 lb/A	Prefar 4E @ 5-6 qt/A	Certain annual grasses and broadleaf weeds	Lettuce: Incorporate 1-2 inches before planting.
trifluralin ² @ 0.5-.75 lb/A	Treflan HFP, Trifluralin, Trilin, and other 4 EC products @ 1 pt/A on light soil 1.5 pt/A on med.-heavy soil 60 DF products @ 0.8 lb/A on light soil 1.33 lbs/A on med.-heavy soil	Small-seeded annual grasses, broadleaf weeds and seedling johnsongrass	Endive, escarole and radicchio: Incorporate thoroughly in top 2 inches of soil just before planting. Cold, wet soil conditions just after planting may increase risk of crop injury. Do not seed until seedbed has warmed.
PREEMERGENCE:			
bensulide @ 5-6 lb/A	Prefar 4E @ 5-6 qt/A	Certain annual grasses and broadleaf weeds	Lettuce: Apply after planting to crops where the application can receive immediate irrigation.
pronamide @ 1-2 lbs/A	Kerb 50-WP @ 2.0-3.0 lbs/A on coarse-med soil 3.0-4.0 lbs/A on fine soil	Annual grasses and broadleaves	Lettuce, endive & escarole: See comments above
POSTEMERGENCE:			
clethodim @ 0.1 - 0.125 lb/A	Select 2 EC, Arrow @ 6 - 8 oz/A Select Max @ 9-16 oz/A Apply with COC @ 1 gal/100 gal Pump up sprayer: 0.33 to 0.66 oz/A clethodim + 1.3 oz/gal COC	Annual and perennial grasses	For use on leaf lettuce: Apply to actively growing grasses. Do not apply more than 8 oz./A in a single application. Rainfast in 1 hour. Do not apply within 14 days of harvest. Allow 14 days between applications.
pronamide @ 1-2 lbs/A	Kerb 50-WP @ 2.0-3.0 lbs/A on coarse-med soil 3.0-4.0 lbs/A on fine soil	Annual grasses and broadleaves.	Head lettuce, endive & escarole: Do not apply to leaf lettuce POST. Apply before or after thinning before weeds germinate. Move herbicide into the root zone by overhead irrigation or rainfall within 2-3 days. Check rotation restrictions. 55 days to harvest. Make one application per year.

VEGETABLE WEED MANAGEMENT

LEAFY VEGETABLES (Lettuce, Endive, Escarole, Radicchio)^{3,4,6,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE continued:			
sethoxydim @ 0.1-0.3 lbs/A	Poast @ 0.5-1.5 pt/A Apply with COC @ 2 pt/A Pump up sprayer: 1.3-2 oz/gal Poast + 1.3 oz/gal COC	Annual and perennial grasses	Lettuce: Apply to actively growing grasses before they exceed labeled heights; consult label. Do not apply within 30 days of head lettuce harvest or within 15 days of leaf lettuce. Adjust pressure (40-60 psi), spray volume (5-20 gal./A) and height of spray boom to ensure thorough coverage. Do not apply more than 4.5 pt./A/year. Rainfast in 1 hour. Poast plus COC should be used with caution because of potential of leaf injury when temperature and RH are high.
fluzafop @ 0.1-0.375 lb/A	Fusilade DX @ 6-8 oz/A Apply with COC @ 1-2 pt/25 gal or NIS @ 0.5-1 pt/25 gal	Annual and perennial grasses	Lettuce and endive: Apply to actively growing grasses before they exceed labeled growth stages; consult label. Use sufficient spray volume (5-40 gal./A) and pressure to ensure complete coverage. Do not harvest lettuce within 28 days after application. Don't apply more than 48 oz./A/season.
DIRECTED POSTEMERGENCE:			
carfentrazone-ethyl @ 0.012-0.024 lb/A	Aim 2 EC @ 75-1.5 oz/A Aim 40 DF @ 0.33-1.0 oz/A Apply with NIS @ 2 pt/100 gal or COC @ 1 gal/100	Most emerged broadleaf weeds No grass control, but can be mixed with grass herbicides.	Lettuce: Direct applications using hooded sprayers. Injury will occur if crop is sprayed. Most effective on weeds less than 4 inches tall. Good coverage is critical.
glyphosate @ 0.5-0.94 lb/A	Roundup Weathermax @ 11-22 oz/A Various 4 L brands @ 16-30 oz/A Various 5 L brands @ 11-24 oz/A	Most emerged weeds	Lettuce: Apply to row middles using only a hooded or shielded sprayer or a wiper applicator. Also may be used post-harvest. Avoid injury by keeping herbicide off all plant parts. 14 days to harvest.

VEGETABLE WEED MANAGEMENT

IRISH POTATO^{3,4,5,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREPLANT/PREPLANT INCORPORATED:			
S-metolachlor @ 0.96-1.9 lb/A	Dual Magnum, Dual II Magnum @ 1 pt/A on light soil 1.5 pt/A on medium soil 2 pt/A on heavy soil	Many small-seeded grasses, yellow nutsedge, pigweed, carpetweed	Incorporate in top 3 inches before planting; consult label. If cool wet weather occurs after application, Dual delays maturity and reduces yields in early maturing varieties. Do not follow this treatment with a preemergence application. Do not harvest within 60 after application. Check label for tank-mixes with other herbicides. Planting and future cultural practices should not bring untreated soil to the surface.
metolachlor @ 0.96-1.9 lb/A	Medal, Stalwart, Parallel, Charger 1 pt/A on light soil 1.5 pt/A on medium soil 2 pt/A on heavy soil	Many small-seeded grasses, yellow nutsedge, pigweed, carpetweed	Incorporate in top 3 inches before planting; consult label. If cool wet weather occurs after application, Dual delays maturity and reduces yields in early maturing varieties. Do not follow this treatment with a premerge application. Do not harvest within 60 days after application. Check label for tank-mixes with other herbicides. Planting and future cultural practices should not bring untreated soil to the surface.
PREEMERGENCE:			
dimethenamid-P	Outlook 6EC @ 12-21 oz/A	Most annual grasses, broadleaf weeds, yellow nutsedge.	Apply after planting or drag-off. Will not control emerged weeds.
rimsulfuron @ 0.016-0.023 lb/A	Matrix 25 DWG @ 1.0 -1½ oz/A	Most annual broadleaf weeds and some grasses	Apply after drag-off or hilling but before potatoes and weeds emerge. If emerged weeds are present add 1-2 pt. of NIS/100 gal. See label for tank-mixtures.
S-metolachlor @ 0.96-1.9 lb/A	Dual Magnum, Dual II Magnum @ 1 pt/A on light soil 1.5 pt/A on medium soil 2 pt/A on heavy soil	Many small-seeded grasses, yellow nutsedge, pigweed, carpetweed	Apply after planting, drag-off or hilling before potatoes or weeds emerge; consult label. If cool wet weather occurs after application, Dual delays maturity and reduces yields in early maturing varieties. Do not use premerge if Dual was used preplant. Do not harvest within 60 after planting. Check label for tank-mixes with other herbicides. Planting and later cultural practices should not bring untreated soil to the surface.
metribuzin @ 0.5-1 lb/A	Sencor 4L @ 1 pt/A on light soil 1.5 pt/A on medium soil 2 pt/A on heavy soil Sencor DF @ 0.66 lb/A on light soil 1 lb/A on medium soil 1.3 lb/A on heavy soil	Crabgrass, foxtail, seedling johnsongrass, fall panicum, broadleaf signalgrass, several broadleaf weeds	Do not plant treated areas to crops other than potatoes for one year after treatment. Do not apply to sweet potatoes or yams. Check label for tank-mixes with other herbicides.

VEGETABLE WEED MANAGEMENT

IRISH POTATO^{3,4,5,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE continued:			
linuron @ 0.75-2.0 lb/A	Lorox DF @ 1-1.5 lbs/A on coarse soil 1.5-2 lbs/A on medium soil	Most small-seeded annual grasses and broadleaf weeds	Apply before crop emergence. Apply before grasses are 2 inches tall and before broadleaf weeds are 6 inches tall. Plant seed at least 2 inches deep. Do not spray over top of emerged potatoes. If emerged weeds are present, add NIS @ 1pt./25 gal. Best results are obtained when application is made to moist soil, followed within 2 weeks by 1-2 inches of rainfall. Check label for tank-mixes with other herbicides.
pendimethalin @ 0.5-1.5 lbs/A	Prowl/Pendimax 3.3EC @ 1.2 pt/A on coarse soil 2.4 pt/A on medium soil 3.6 pt/A on fine soil Prowl H2O @ 1.0 pt/A on coarse soil 2.0 pt/A on medium soil 3.0 pt/A on fine soil Pentagon DG @ 0.85-1.25 lb/A on coarse soil 1.25-1.7 lb on medium soil 1.7-2.5 lb on fine soil	Most annual grasses, seedling Johnsongrass; good control of some small-seeded broadleaves such as pigweed	Apply after planting before crop or weeds emerge or after drag off. Most effective when rainfall is received within 7 days of application. Incorporate 1-2 inches deep if it does not rain within 7 days. Check label for tank mixes with other herbicides. Do not apply before planting. Do not apply to sweet potatoes.
flumioxazin @ 0.047 lb/A	Chateau 51 WD @ 1.5 oz/A	Most annual broadleaf weeds and some grasses	Apply after hilling, before crop emerges. A minimum of 2 inches of soil must cover crop at the time of application. Check label for tank-mixes.
POSTEMERGENCE:			
clethodim @ 0.1 - 0.125 lb/A	Select @ 6 - 8 oz/A Apply with COC at 1 gal/100 gal Pump up sprayer: 0.33 to 0.66 oz/gal Select + 1.3 oz/gal COC	Annual and perennial grasses	Apply to actively growing grasses. 30 days to harvest. Rainfast in 1 hour. Don't apply more than 8 oz./A/application. Allow 14 days between applications.
pendimethalin @ 0.75-1.5 lb/A	Prowl/Pendimax 3.3EC @ 1.2 pt/A on coarse soil 2.4 pt/A on medium soil 3.6 pt/A on fine soil Prowl H2O @ 1.0 pt/A on coarse soil 2.0 pt/A on medium soil 3.0 pt/A on fine soil	Most annual grasses, seedling Johnsongrass; good control of some small-seeded broadleaves such as pigweed; will not control emerged weeds	Apply after crop emergence to 6-inch stage of growth. This treatment is most effective when adequate rainfall is received within 7 days after application. Do not apply if potatoes are under stress from cold/wet or hot/dry conditions or crop injury may occur. Check label for tank-mixes with other herbicides.

VEGETABLE WEED MANAGEMENT

IRISH POTATO^{3,4,5,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE: continued			
sethoxydim @ 0.09-0.47 lbs/A	Poast @ 0.5-2.5 pt/A Apply with COC @ 2 pt/A Pump up sprayer: 1.3-2 oz/gal Poast + 1.3 oz/gal COC	Annual and perennial grasses	Apply before grasses exceed height recommended for treatment. Do not apply Poast within 30 days of harvest. Do not apply more than a total of 5 pt./A in one season. Do not apply if rainfall is expected within one hour following application. Do not apply to grasses under stress.
DIRECTED POSTEMERGENCE:			
glyphosate @ 0.5-0.94 lb/A	Roundup Weathermax @ 11-22 oz/A Various 4 L brands @ 16-30 oz/A Various 5 L brands @ 11-24 oz/A	Most emerged weeds	Apply with a hooded sprayer in row middles, as shielded sprayer in row middles, as wiper applications in row middles or postharvest. To avoid severe injury to the crop, do not allow herbicide to contact foliage, green shoots, stems, exposed roots or fruit of crop. Do not apply within 14 days of harvest.
S-metolachlor @ 0.96-1.4 lb/A	Dual Magnum @ 1.67 pt/A	Many small-seeded grasses, yellow nutsedge, pigweed, carpetweed No control of emerged weeds	Apply as a directed spray after hilling/layby to row middles. May be applied over a previous Dual Magnum application. Do not exceed 3.6 pt./A of Dual Magnum in a single crop season. Potatoes should not be harvested 40 days after a layby application. If cool, wet weather occurs after application, Dual may delay maturity and reduce yields in early maturing varieties.
metolachlor @ 0.96-1.4 lb/A	Medal, Stalwart, Parallel, Charger @ 1.67 pt/A	Many small-seeded grasses, yellow nutsedge, pigweed, carpetweed No control of emerged weeds	See comments for S-metolachlor.
carfentrazone-ethyl @ 0.012-0.024 lb/A	Aim 2EC @ 0.75-1.5 oz/A Aim 40DF @ .33-1.0 oz/A Apply with NIS @ 2 pt/100 gal or COC at 1 gal/100 gal	Most emerged broadleaf weeds No grass control; can be mixed with grass herbicides	Direct applications using hooded sprayers. Injury will occur if crop is sprayed. Most effective when weeds are less than 4 inches tall. Coverage is critical.
HARVEST AID:			
endothall @ 0.75-1.0 lb/A	Des-I-Cate @ 1.5-2 gal/A Desicate II @ 1.5-2 qt/A	Desiccate potato vines	Apply to vines 10-14 days prior to harvest. In addition to facilitating harvest, it assists in setting potato skins. Apply in 20-100 GPA. Use higher rates for heavy vine growth. Only mechanically harvest treated potatoes. Culling of harvested potatoes is allowed.
diquat dibromide @ 0.25-0.5 lb/A	Reglone Diquat @ 1-2 pt/A Apply with NIS @ 1 pt/100 gal	Desiccate potato vines	Apply at least 7 days prior to harvest. Apply in 20-100 GPA. Use higher volumes (40-100 GPA) for heavy vine growth. Make a second application a minimum 5 days after first application where vine growth is dense. Do not exceed a total of 4 pt./A.

VEGETABLE WEED MANAGEMENT

OKRA^{3,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREPLANT/PREPLANT INCORPORATED:			
trifluralin ² @ 0.5-.1.0 lb/A	Treflan HFP, Trifluralin, Trilin, and other 4 EC products @ 1 pt/A on light soil 1.5 pt/A on med 2.0 pt/A on heavy soil 60 DF products @ 0.87 lb/A on light soil 1.33 lbs/A on medium soil 1.66 lbs/A on heavy soil	Small-seeded annual grasses, broadleaf weeds and seedling johnsongrass	Incorporate thoroughly in top 2 inches of soil just before planting. Check label for rates of other formulations of trifluralin.
DIRECTED POSTEMERGENCE:			
glyphosate @ 0.5-0.94 lb/A	Roundup Weathermax @ 11-22 oz/A Various 4 L brands @ 16-30 oz/A Various 5 L brands @ 11-24 oz/A	Most emerged weeds	Apply with a hooded sprayer in row middles, as shielded sprayer in row middles, as wiper applications in row middles or postharvest. To avoid severe injury to the crop do not allow herbicide to contact foliage, green shoots, stems, exposed roots or fruit of crop. Do not apply with 14 days of harvest.
carfentrazone-ethyl @ 0.012–0.024 lb/A	Aim 2EC @ 0.75-1.5 oz/A Aim 40DF @ .33-1.0 oz/A Apply with NIS @ 2 pt/100 gal or COC at 1 gal/100 gal	Most emerged broadleaf weeds No grass control; can be mixed with grass herbicides	Direct applications using hooded sprayers. Injury will occur if crop is sprayed. Most effective when weeds are less than 4 inches tall. Coverage is critical.

VEGETABLE WEED MANAGEMENT

ONION^{3,4,5,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREPLANT/PRETRANSPLANT:			
oxyfluorfen @ 0.25-0.5 lb/A	Goal 1.6E @ 1.25-2.5 pt/A Galligan 2 E @ 1.0-2.0 pt/A	Many annual broadleaf weeds	Apply after soil preparation, but prior to transplanting. Transplanting should be completed with minimal soil disturbance. Do not exceed 2 pt./A as a result of multiple applications in one season. If less than 2 pt./A is applied as a pre- or post-transplant treatment, postemergence applications can be made. Do not apply to direct-seeded onions.
PREEMERGENCE/POST-TRANSPLANT:			
oxyfluorfen @ 0.25-0.5 lb/A	Goal 1.6E @ 1.25-2.5 pt/A Galligan 2 E @ 1.0-2.0 pt/A	Many annual broadleaf weeds	Transplant dry bulb only. Onions are most tolerant to this application immediately following or within 2 days of transplanting. Do not disturb treated soil. Do not exceed 2 pt./A/year. If less than 2 pt./A is applied as a pre- or post-transplant treatment, POST applications can be made.
DCPA	Dacthal 75 WP @ 6-8 lb/A on light soil 8-10 lb/A on medium soil 10-14 lb/A on heavy soil	Annual grasses and certain broadleaf weeds	Dry bulb onions direct-seed or transplant. Apply in at least 20 GPAA. A minimum of 1/3-1/2 inch of water is necessary to activate within 3-5 days of application. Do not incorporate.
POSTEMERGENCE:			
fluazifop @ 0.1-.375 lb/A	Fusilade DX @ 6-24 oz/A Apply with COC @ 1-2 pt/25 gal or NIS @ 0.5-1 pt/25 gal Pump up sprayer: 0.75 fl oz/gal Fusilade + 1.5 oz/gal COC	Annual and perennial grasses	Dry bulb onions. Apply to actively growing grasses before they exceed the recommended growth stages; consult label. 45 days to harvest. Use sufficient spray volume (5-40 GPA) and pressure (40-60 psi) to ensure complete coverage. Do not apply more than 48 oz./A/season. Rainfast in 1 hour.
bromoxynil @ 0.25-0.375lb/A	Buctril, Moxy 2EC @ 1-1.5 pt/A Buctril 4EC @ 0.5 to .75 pt/A	Many broadleaf weeds	Dry bulb onions. Apply to onions with 2-5 true leaves. Water volume is important; use 50-70 GPA. Soil and onion foliage should be dry at time of application, humidity should be low and dew should be dried. Do not treat if thrip damage or other damage has removed or reduced the waxy coating on the onion foliage. Even under ideal conditions some crop damage or death may occur.
dimethenamid-p @ 0.6 – 1.0 lb/A	Outlook 6 EC @ 12 – 24 oz/A	Most annual grasses and some broadleaf weeds	Dry bulb onions. Apply after onions have 2 true leaves. Do not apply within 30 days of harvest. If applications are made to transplant crop, DO NOT APPLY until transplants are in the ground and soil has settled around transplants with several days to recover.

VEGETABLE WEED MANAGEMENT

ONION^{3,4,5,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE continued:			
sulfuric acid	Battery Acid @ 3-5% solution of actual sulfuric acid	Emerged small broadleaf weeds and some grasses	Dry bulb onions. Apply after onions have reached the 2- to 4-leaf stage and weeds are in the 2- to 4-leaf stage. For best results apply on bright, sunny and warm days. Apply in 40-60 gal. of water for through coverage. Pour acid into water, never water into acid. Wear protective clothing and eyewear.
oxyfluorfen @ 0.12 lb/A	Goal 1.6E @ 0.6 pt/A Galligan 2E @ 0.5 pt/A	Many annual broadleaf weeds	Apply when onions have at least 2-3 fully developed true leaves and when weeds are in the 2- to 4-leaf stage or 2 weeks after transplanting. 45 days to harvest. Don't apply to onions under stress. Multiple treatments may be applied. Maximum use rate is 2 pt./A/yr. Apply in a minimum of 40 gal. of water/A with flat fan tips at 20 to 40 psi. Avoid windy days. For dry bulb onions avoid application during extended periods of cloudy, humid weather when soil moisture is plentiful.
clethodim @ 0.1 - 0.125 lb/A	Select, Arrow @ 6 - 8 oz/A Select Max @ 9-16 oz/A Apply with COC at 1 gal/100 gal Pump up sprayer: 0.33 to 0.66 oz/gal Select + 1.3 oz/gal COC	Annual and perennial grasses and bluegrass	Dry bulb onions. Apply to actively growing grasses. Rates vary by grass species, stage and region; consult label. Rainfast in 1 hour. Apply a minimum of 45 days before harvest. Maximum use rate is 0.5 lb. ai/A/year. 20 GPA minimum volume.
sethoxydim @ 0.1-0.3 lbs/A	Poast @ 0.5-1.5 pt/A Apply with COC @ 2 pt/A Pump up sprayer: 1.3-2 oz/gal Poast + 1.3 oz/gal COC	Annual and perennial grasses	Green and dry bulb onions. Apply to actively growing grasses before recommended heights are exceeded; consult label. Adjust pressure (40-60 psi), spray volume (5-20 gal./A) and height of spray boom to ensure thorough coverage. Do not apply within 30 days of harvest. Do not apply more than 4.5 pt./A/season. Rainfast in 1 hour. Should be used with caution because of potential of leaf injury when temperatures exceed 90 F and relative humidity is 60% or higher or the temperature exceeds 100 F.
pendimethalin @ 0.75-1.5 lbs/A	Prowl/Pendimax 3.3EC @ 1.2 pt/A on coarse soil 2.4 pt/A on medium soil 3.6 pt/A on fine soil Prowl H2O @ 1.0 pt/A on coarse soil 2.0 pt/A on medium soil 3.0 pt/A on fine soil	Many small-seeded grasses and broadleaves	Dry bulb onions direct seed or transplant. Apply between the 2- to 9-true-leaf stage. Do not apply within 45 days of harvest. Treatments are most effective when not more than 0.5 inch of rainfall or overhead irrigation is received within 7 days after application. Heavy rains after application can cause crop injury.

VEGETABLE WEED MANAGEMENT

ONION^{3,4,5,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
DIRECTED POSTEMERGENCE:			
glyphosate @ 0.5-0.94 lb/A	Roundup Weathermax @ 11-22 oz/A Various 4 L brands @ 16-30 oz/A Various 5 L brands @ 11-24 oz/A	Most emerged weeds	Apply with a hooded sprayer in row middles, as shielded sprayer in row middles, as wiper applications in row middles or postharvest. To avoid severe injury to the crop do not allow herbicide to contact foliage, green shoots, stems, exposed roots or fruit of crop. Do not apply with 14 days of harvest.
carfentrazone-ethyl @ 0.012–0.024 lb/A	Aim 2EC @ 0.75-1.5 oz/A Aim 40DF @ .33-1.0 oz/A Apply with NIS @ 2 pt/100 gal or COC at 1 gal/100 gal	Most emerged broadleaf weeds No grass control; can be mixed with grass herbicides	Direct applications using hooded sprayers. Injury will occur if crop is sprayed. Most effective when weeds are less than 4 inches tall. Coverage is critical.
trifluralin @ 0.375-0.625 lb/A	Treflan HFP 4EC, Trifluralin 4EC, Trilin 4EC @ 0.75 pt/A on light oil 1.25 pt/A on med-heavy soil	Many small-seed grasses and broadleaves	Dry bulb onions direct-seed or transplant. Apply to row middles with shields. Incorporate within 1 day of application. Rate varies by soil type. Avoid contacting roots, bulbs or foliage with spray.

VEGETABLE WEED MANAGEMENT

PEPPERS^{4,5,6,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREPLANT/PREPLANT INCORPORATED:			
trifluralin ² @ 0.5-1.0 lb/A	Treflan HFP, Trifluralin, Trilin, and other 4 EC products @ 1 pt/A on light soil 1.5 pt/A on med 2.0 pt/A on heavy soil 60 DF products @ 0.87 lb/A on light soil 1.33 lbs/A on medium soil 1.66 lbs/A on heavy soil	Many small-seeded annual grasses, broadleaf weeds and seedling johnsongrass	Bell and hot pepper transplants only: Incorporate thoroughly in top 2 inches of soil just before transplanting.
oxyfluorfen @ 0.5-1.0 lbs/A	Goal @ 1-2 pt/A	Broadleaf weeds, some grasses, geranium and cutleaf evening primrose.	Bell and hot pepper transplants only; Plastic culture only: Apply to soil surface on preformed beds at least 30 days prior to transplanting. Incorporation is not necessary, but it may result in less crop injury. Best results are obtained if plastic is applied soon after application.
pendimethalin @ 0.75-1.5 lbs/A	Prowl H2O @ 1.0-1.5 pt/A on coarse soil 1.5-2.0 pt/A on medium soil 2.0-3.0 pt/A on fine soil	Many small-seeded grasses and broadleaves	Apply before transplanting, but not under plastic. Do not apply before direct seeding hot peppers. Incorporation is beneficial when rainfall does not occur to activate.
napropamide ² @ 1-2 lb/A	Devrinol 50DF @ 2 lb/A on light soil 4 lb/A on heavy soil Devrinol 2EC @ 0.5 gal/A on light soil 1.0 gal/A on heavy soil	Many small-seeded annual grasses and broadleaves	Hot pepper only: Can be used on direct-seeded or transplanted crops. Apply to well-worked soil and incorporate 1-2 inches in the same day.
clomazone @ 0.25-1.0 lb/A	Command 3ME @ 0.67-2.67 pt/A	Most annual grasses and some Small-seeded broadleaf weeds	Bell and hot pepper (except banana): Do not use on banana peppers. Incorporate 1 inch or less before planting. Plant seed or transplants below the chemical barrier. Foliar contact with spray drift may cause temporary whitening of plants. Whitening may persist on some plants. Do not apply Command 3ME within 1,200 sensitive areas; see label.
metolachlor @ 0.48 – 0.95 lb/A	Dual Magnum 7.62 EC @ 0.5 – 1.0 pt/A	Most annual grasses and some Small-seeded broadleaf weeds as well as yellow nutsedge	Special local need label; Bell and non-bell peppers excluding tabasco: Apply broadcast preplant <u>non-incorporated</u> prior to transplanting. No activity on existing weeds. Apply to weed-free prepared area prior to weed emergence.

VEGETABLE WEED MANAGEMENT

PEPPERS^{4,5,6,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE:			
halosulfuron @ 0.024-0.048 lb/A	Sandea 75 DF or Profine 75 DF @ 0.5 - 1 oz/A Apply with NIS @ 1 qt/100 gal	Nutsedge and some broadleaf weeds	Bell and hot pepper transplants only: Apply to row middles between plastic only. Don't allow herbicide to contact the crop or plastic. Early season application will give post- and preemerge control. Do not apply more than 2 oz./A in a 12-month period. Check label for recrop intervals.
POSTEMERGENCE:			
metolachlor @ 0.48 – 0.95 lb/A	Dual Magnum 7.62 EC @ 0.5 – 1.0 pt/A	Most annual grasses and some Small-seeded broadleaf weeds as well as yellow nutsedge	Special local need label for Louisiana; Labeled for bell and non-bell peppers excluding tabasco: Apply broadcast <u>within 48 hours after transplanting</u> . No activity on existing weeds. Apply to weed-free prepared area prior to weed emergence.
clethodim @ 0.1 - 0.125 lb/A	Select, Arrow @ 6 - 8 oz/A Select Max @ 9-16 oz/A Apply with COC at 1 gal/100 gal Pump up sprayer: 0.33 to 0.66 oz/gal Select + 1.3 oz/gal COC	Annual and perennial grasses	Bell and hot pepper transplants only: Apply to actively growing grasses. Rainfast in 1 hour. Apply a minimum of 20 days before harvest. Do not apply more than 8 oz./A per application. Allow 14-days between applications.
fluazifop @ 0.094-0.375 lb/A	Fusilade DX @ 0.375 - 1.5 pt/A Apply with COC @ 1-2 pt/25 gal or 0.5-1 pt/25 gal NIS Pump up sprayer: 0.75 oz/gal Fusilade + 1.5 oz/gal COC or 1/2 oz/gal NIS	Annual and perennial grasses	Not labeled on bell peppers; special local need label for Louisiana: Use on Tabasco, other hot and non-bell type peppers. Apply to actively growing grasses before they exceed the recommended stages; consult label. Use sufficient spray volume (5-40 GPA) and pressure (40-60 psi) to ensure complete coverage. Do not harvest within 45 days after application. Do not apply more than 48 oz./A/season Fusilade DX. When grass foliage is dense, use 60 psi & minimum of 20 GPA. Best coverage is obtained when two nozzles are used, one directed to each side of the row.
halosulfuron @ 0.024-0.048 lb/A	Sandea 75 DF or Profine 75 DF @ 0.5 - 1 oz/A + NIS at 1 qt/100 gals.	Nutsedge and some broadleaf weeds	Bell and hot pepper transplants only: Apply to row middles between plastic only. Don't allow herbicide to contact the crop or plastic. Early season application will give post- and preemerge control. Do not apply more than 2 oz./A in a 12-month period. Long residual. Check label for recrop intervals. 30 days to harvest.

VEGETABLE WEED MANAGEMENT

PEPPERS^{4,5,6,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE continued:			
sethoxydim @ 0.1-0.3 lb/A	Poast @ 0.5-1.5 pt/A Apply with 2 pt/A COC Pump up sprayer: 1.3-2 oz/gal Poast +1.3 oz/gal COC.	Annual and perennial grasses	Bell and hot pepper transplants only: Apply TO actively growing grasses before they exceed recommended heights. Adjust pressure (40-60 psi), spray volume (5-20 GPA) and height of spray boom to ensure thorough coverage. Apply at least 20 days before harvest. Do not apply more than 4 1/2 pt./A/season. Crop oil should be used with caution because of potential leaf injury when temperature exceeds 90 F and the relative humidity is 60% or higher, or anytime the temperature exceeds 100 F. Rainfast in 1 hour.
DIRECTED POSTEMERGENCE:			
S-metolachlor @ 1.23 – 2.48 lb/A	Dual Magnum 7.62 EC @ 1.3 – 2.6 pt/A	Most annual grasses and some small seeded broadleaf weeds as well as yellow nutsedge	Special local need label; postemergence directed spray at layby in tabasco peppers only: Do not apply over the top or as a band over tabasco peppers. Dual has no activity on emerged weeds. Apply to weed-free tilled or plowed soil.
pendimethalin @ 0.75-1.5 lbs/A	Prowl H2O @ 1.0-1.5 pt/A on coarse soil 1.5-2.0 pt/A on medium soil 2.0-3.0 pt/A on fine soil	Many small-seeded grasses and broadleaves	Apply to row middles as a directed spray. Avoid contact with foliage and stems. 70 days to harvest.
paraquat @ 0.49 lb/A	Gramoxone Inteon @ 2 pt/A Firestorm, Parazone @ 1.3 pt/A Apply with NIS @ 1 pt/100 gal or COC @ 1 gal/100 gal Pump up sprayer: 0.50 oz/gal paraquat + 0.33-0.5 oz/gal NIS or 1.3 oz/gal COC	Emerged small, annual broadleaf weeds and grasses; top kill and suppression of perennials	Bell and hot pepper transplants only: Apply to row middles using shields or hooded sprayers. Apply when weeds are 1-6 inches high. 30 days to harvest. Use 20-100 gal. water/A. Do not exceed 30 PSI if prone to drift. Do not apply more than 3 times per season. Do not feed or allow animals to graze treated areas.
carfentrazone-ethyl @ 0.012-0.024 lb/A	Aim 1.9 or 2 EC @ 0.75-1.5 oz/A Apply with COC @ 1 gal/100 gal or NIS at 2 pt/100 gal	Most emerged broadleaf weeds No grass control; can be mixed with grass herbicides	Bell and hot pepper transplants only: Apply to row middles using shields or hooded sprayers. Most effective when weeds are less than 4 inches tall or rosettes are less than 3 inches across. Injury will occur if crop is sprayed. Good coverage is essential for good weed control.

VEGETABLE WEED MANAGEMENT

PEPPERS^{4,5,6,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
DIRECTED POSTEMERGENCE continued:			
glyphosate @ 0.5-0.94 lb/A	Roundup Weathermax @ 11-22 oz/A Various 4 L brands @ 16-30 oz/A Various 5 L brands @ 11-24 oz/A	Most emerged weeds	Bell and hot pepper transplants only: Apply to row middles only with a hooded sprayer, shielded sprayer or a wiper applicator. Can be used postharvest. Severe injury will occur if herbicide contacts foliage, green shoots, stems, exposed roots or fruit. Do not apply within 14 days of harvest.

VEGETABLE WEED MANAGEMENT

SHALLOT (Dry Bulbs)

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREPLANT INCORPORATED:			
bensulide @ 5-6 lb/A	Prefar 4 EC @ 5 qt/A on light soil 6 qt/A on medium-fine soil	Some broadleaf and annual grasses	Incorporate to a depth of 1-2 inches before planting.
PREEMERGENCE:			
bensulide @ 5-6 lb/A	Prefar 4 EC @ 5 qt/A on light soil 6 qt/A on medium-fine soil	Some broadleaf and annual grasses	Apply preemergence only on crops where application is followed by immediate irrigation.
POSTEMERGENCE:			
sethoxydim @ 0.1-0.3 lb/A	Poast @ 0.5-1.5 pt/A Apply with 2 pt/A COC Pump up sprayer: 1.3-2 oz/gal Poast +1.3 oz/gal COC	Annual and perennial grasses	Apply actively growing grasses before they exceed labeled heights; consult label. Adjust equipment to ensure thorough coverage. Don't apply more than 4 1/2 pt./A/season. Use with caution because of potential leaf injury when temperature exceeds 90 F and the RH is >60% or anytime the temperature exceeds 100 F. Rainfast in 1 hour. 30 days to harvest.
clethodim @ 0.1 - 0.125 lb/A	Select, Arrow @ 6 - 8 oz/A Select Max @ 9-16 oz/A Apply with COC at 1 gal/100 gal	Annual and perennial grasses	Apply to actively growing grasses. Rates vary by species, stage and region; consult label. Rainfast in 1 hour. Do not apply more than 0.5 lb. ai/A/ season. Apply a minimum of 45 days before harvest. Pump up sprayer: 0.33 to 0.66 oz./gal Select + 1.3 oz./gal COC
dimethenamid-p @ 0.6 – 1.0 lb/A	Outlook 6 EC @ 12 – 24 oz/A	Most annual grasses and some broadleaf weeds	Do not apply until transplants from bulbs have reached the 2-true-leaf stage and the soil has settled around transplants for several days to recover. Do not apply more than 21 oz./A/season. Check label for tank-mixes and rotational restrictions.
pendimethalin @ 0.75-1.5 lbs/A	Prowl/Pendimax 3.3EC @ 1.2 pt/A on coarse soil 2.4 pt/A on medium soil 3.6 pt/A on fine soil Prowl H2O @ 1.0 pt/A on coarse soil 2.0 pt/A on medium soil 3.0 pt/A on fine soil	Many small-seeded grasses and broadleaves	Apply after crop reaches 2- to 9-leaf stage. Do not apply within 45 days of harvest. Most effective when rainfall or overhead irrigation is received within 7 days.
DIRECTED POSTEMERGENCE:			
glyphosate @ 0.5-0.94 lb/A	Various 4 L brands @ 16-30 oz/A Various 5 L brands @ 11-24 oz/A	Most emerged weeds	Apply to row middles only with a hooded sprayer, shielded sprayer or a wiper applicator. Severe injury will occur if herbicide contacts foliage, green shoots, stems, exposed roots or fruit. Do not apply within 14 days of harvest.

VEGETABLE WEED MANAGEMENT

SOUTHERN PEA^{3,4,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREPLANT/PREPLANT INCORPORATED:			
S-metolachlor ² @ 1.0-2.0 lb/A	Dual Magnum, Dual II Magnum @ 1 pt/A on light soil 1.5 pt/A on medium soil 2.0 pt/A on heavy soil	Many small-seeded grasses, yellow nutsedge, pigweed, carpetweed	Incorporate 2 inches deep before planting. Check label for tank-mixes with other herbicides. Combine with another herbicide to increase spectrum of broadleaf weed control.
metolachlor ² @ 1-2 lb/A	Medal, Stalwart, Parallel, Charger 1 pt/A on light soil 1.5 pt/A on medium soil 2.0 pt/A on heavy soil	Many small-seeded grasses, yellow nutsedge, pigweed, carpetweed	Incorporate 2 inches deep before planting. Check label for tank-mixes with other herbicides. Combine with another herbicide to increase spectrum of broadleaf weed control.
pendimethalin @ 0.5-1.5 lb/A	Prowl 3.3 EC @ 1.2-1.8 lb/A on coarse soil 1.8-2.4 lb/A on medium soil 1.8-3.6 lb/A on fine soil Prowl H2O 1.5 PT/A on coarse soil 2.0 PT/A on medium soil 3.0 PT/A on fine soil	Annual grasses and broadleaf weeds	Incorporate thoroughly into the top 1-2 inches of soil up to 60 days prior to planting. Do not use preemergence. Cold, wet soil conditions after planting may increase risk of crop injury. Check label for tank-mixes with other herbicides.
imazethapyr @ 0.064 lbs/A	Pursuit 2 EC @ 4 oz/A Pursuit 70 DG @ 1.5 oz/A	Several broadleaf weeds; reduces competition from morningglories	Incorporate before planting. May cause crop injury. Use of Pursuit is at the user and/or grower risk. The use of trifluralin with Pursuit may increase the likelihood and severity of crop damage. Do not make more than one application of Pursuit for a year. Allow 30 days between application and harvest.
trifluralin ² @ 0.5-.1.0 lb/A	Treflan HFP, Trifluralin, Trilin, and other 4 EC products @ 1 pt/A on light soil 1.5 pt/A on med 2.0 pt/A on heavy soil 60 DF products @ 0.87 lb/A on light soil 1.33 lbs/A on medium soil 1.66 lbs/A on heavy soil	Many small-seeded annual grasses, broadleaf weeds and seedling johnsongrass	Incorporate thoroughly in top 2 inches of soil just before planting. Cold, wet soil conditions after planting increase the risk of crop injury. Check label for rates of other trifluralin formulations.
PREEMERGENCE:			
S-metolachlor @ 1.0-2.0 lb/A	Dual Magnum, Dual II Magnum @ 1 pt/A on light soil 1.5 pt/A on medium soil 2.0 pt/A on heavy soil	Many small-seeded grasses, yellow nutsedge, pigweed, carpetweed	Apply after planting before weeds and crop emerge. Combine with other herbicides for improved broadleaf control; consult label. More effective on nutsedge when incorporated before planting.

VEGETABLE WEED MANAGEMENT

SOUTHERN PEA^{3,4,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREEMERGENCE continued:			
metolachlor @ 1.0-2.0 lb/A	Medal, Stalwart, Parallel, Charger 1 pt/A on light soil 1.5 pt/A on medium soil 2.0 pt/A on heavy soil	Many small-seeded grasses, yellow nutsedge, pigweed, carpetweed	Apply after planting before weeds and crop emerge. Combine with other herbicides for improved broadleaf control; consult label. More effective on nutsedge when incorporated before planting.
imazethapyr @ 0.064 lbs/A	Pursuit 2 EC @ 4 oz/A Pursuit 70 DG @ 1.5 oz/A	Several broadleaf weeds; reduces competition from morningglories	Apply after planting, before crop and weeds emerge. May cause crop injury. Use of Pursuit is at the user and/or grower risk. The use of trifluralin prior to Pursuit may cause crop damage. Do not exceed one Pursuit application per year. Pursuit must be applied at least 30 days before harvest.
POSTEMERGENCE:			
quizalofop p-ethyl @ 0.04-0.08 lb/A	Assure II 0.88EC @ 6-12 oz/A Apply with COC @ 1 gal/100 gal or NIS @ 1 qt/100 gal	Annual and perennial weeds	Apply to actively growing grasses; consult label for application timing. COC may increase the likelihood of crop injury at high temperatures. Do not apply on unusually hot and humid days. Apply at least 30 days before harvest.
bentazon @ 0.5 – 1.0 lb/A	Basagran 4SL @ 1.0 -2.0 pt/A	Annual broadleaf weeds and yellow nutsedge	Apply over the top when peas have at least 3 pairs of leaves. Do not add crop oil concentrate to the spray solution. Do not apply within 30 days of harvest. Do not apply when peas are in bloom.
imazethapyr @ 0.032- 0.064 lbs/A	Pursuit 2 EC @ 2-4 oz/A Pursuit 70 DG @ 0.72 - 1.44 oz/A Apply with NIS @ 2 pt/100 gal; Do not use COC or MSO	Several broadleaf weeds; reduces competition from morningglories	Apply when peas are at least 3 inches tall, but before 5 nodes and flowering. Apply when weeds are 1-3 inches tall or have 1-4 leaves. May cause crop injury; applicator and/or grower assumes the risk. The use of trifluralin prior to Pursuit may cause crop damage. Do not exceed one Pursuit application per year. Pursuit must be applied at least 30 days before harvest. Check label for maximum number of leaves at which weeds should be sprayed post emergence.
sethoxydim @ 0.1-0.3 lb/A	Poast @ 0.5-1.5 pt/A Apply with 2 pt/A COC Pump up sprayer: 1.3-2 oz/gal Poast +1.3 oz/gal COC	Annual and perennial grasses	Apply to small, actively growing grasses; consult label for application timing. Do not apply on days that are hot and humid. Do not apply within 15 days of harvest.
DIRECTED POSTEMERGENCE:			
carfentrazone-ethyl @ 0.012 – 0.024 lb/A	Aim 2 EC @ 0.75-1.5 oz/A AIM 40 DF @ .33-1.0 oz/A Apply with NIS @ 2 pt	Most emerged broadleaf weeds No grass control; can be mixed with grass herbicides	Directed applications using hooded sprayers. Injury will occur if crop is sprayed. Most effective when weeds are less than 4 inches tall. Good coverage equals good weed control.

VEGETABLE WEED MANAGEMENT**SOUTHERN PEA^{3,4,7}**

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
DIRECTED POSTEMERGENCE continued:			
glyphosate @ 0.5-0.94 lb/A	Various 4 L brands @ 16-30 oz/A Various 5 L brands @ 11-24 oz/A	Most emerged weeds	Apply to row middles only with a hooded sprayer, shielded sprayer or a wiper applicator. Severe injury will occur if herbicide contacts foliage, green shoots, stems, exposed roots or fruit.

VEGETABLE WEED MANAGEMENT

SPINACH³

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREPLANT INCORPORATED:			
cycloate @ 3 lb/A	RoNeet 6EC @ 2 qt/A	Annual grasses and broadleaves	Incorporate 2-3 inches before planting.
POSTEMERGENCE:			
sethoxydim @ 0.1-0.3 lbs/A	Poast @ 0.5-1.5 pt/A	Annual and perennial grasses.	Apply actively growing grasses before they exceed labeled heights; consult label. Adjust pressure (40-60 psi), volume (5-20 GPA) and boom height to ensure thorough coverage. Don't apply more than 3 pt./A per season. COC should be used with caution because of potential leaf injury when temperature exceeds 90 F and the relative humidity is 60% or higher or anytime the temperature exceeds 100 F. Rainfast in 1 hour. Apply at least 15 days before harvest.
	Apply with COC @ 2 pt/A	Does not control annual bluegrass	
	Pump up sprayer: 2 oz/gal Poast + 1.3 oz/gal COC		
clethodim @ 0.1 - 0.125 lb/A	Select, Arrow @ 6 - 8 oz/A Select Max @ 9-16 oz/A	Annual and perennial grasses	Apply to actively growing grasses. Rates vary by grass species and stage; consult label. Rain fast in 1 hour. Do not apply more than 0.50 lb. ai/A/year. Adding COC increases chances of crop injury, especially at high temperatures.
	Apply with COC at 1 gal/100 gal		
	Pump up sprayer: 0.33 to 0.66 oz/gal Select + 1.3 oz/gal COC		
clopyralid @ 0.125-0.187 lb/A	Stinger 3 EC @ 0.66-0.5 pt/A	Broadleaf weeds	Apply to spinach in the 2- to 5-leaf stage when weeds are small and actively growing. Do not apply within 21 days of harvest. Will control most legumes.
phenmedipham @ 0.4-1.0 lb/A	Spin-Aid @ 3-6 pt/A	Selected broadleaf weeds	Apply to actively growing weeds in 11-22 GPA of water when weeds are at the 2-leaf stage and spinach is past the 4- to 6-true-leaf stage. Split rate: apply at 2-leaf stage of spinach, repeat 4-6 days later with 3 pt./A. May cause injury if the crop is under stress. Use when temperatures are below 75 F, and spray just before sunset to prevent possible injury. Some injury, stunting, chlorosis or tip burn, may be seen. Crops usually resume growth in 10 days. Apply at least 40 days before harvest.
	Split rate: 2.5-3 pt/A followed by 2.5-3 pt/A		
DIRECTED POSTEMERGENCE:			
glyphosate @ 0.5-0.94 lb/A	Various 4 L brands @ 16-30 oz/A	Most emerged weeds.	Apply to row middles only with a hooded sprayer, shielded sprayer or a wiper applicator. Severe injury will occur if herbicide contacts foliage, green shoots, stems, exposed roots or fruit. 14 days to harvest.
	Various 5 L brands @ 11-24 oz/A		
carfentrazone-ethyl @ 0.012 – 0.024 lb/A	Aim 2 EC @ 0.75-1.5 oz/A AIM 40 DF @ .33-1.0 oz/A	Most emerged broadleaf weeds; no grass control; can be mixed with grass herbicides	Directed applications using hooded sprayers. Injury will occur if crop is sprayed. Most effective when weeds are less than 4 inches tall. Good coverage equals good weed control.
	Apply with NIS @ 2 pt/100 gal		

VEGETABLE WEED MANAGEMENT

SWEET POTATO

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREPLANT:			
flumioxazin @ 0.063 – 0.079 lb/A	Valor SX @ 2-2.5 oz/A	Smellmelon, prickly sida, copperleaf, pigweeds May suppress annual sedges	Apply before transplanting to a clean seed bed. Do not apply post-transplant as foliar burn will occur.
POST-TRANSPLANT:			
clomazone @ 0.5-1.0 lbs/A	Command 3ME @ 1.33-2.33 pt/A	Annual grasses and broadleaf weeds	Apply after transplanting before weeds emerge. Do not apply within 1,200 feet of sensitive areas; consult label. Sedges may become more problematic when Command is used. 125 days to harvest. Consult label for recrop intervals.
S-metolachlor @ 1.0-2.0 lb/A	Dual Magnum @ 1.0 pt/A on light soil 1.33 pt/A on med-heavy soil	Many small-seeded grasses, yellow nutsedge, pigweed, carpetweed	Apply after transplanting before weeds emerge. Do not incorporate. Injury potential increases on sandy or loamy sand soils, especially if heavy rainfall occurs shortly after application. If irrigation is used, don't apply more than 1/2 inch of water following a Dual Magnum application.
fluazifop @ 0.094-0.375 lb/A	Fusilade DX @ 0.375-1.5 pt /A Apply with COC @ 1-2 pt/25 gal or NIS @ 0.5-1 pt/25 gal	Annual and perennial grasses	Apply to actively growing grasses before they exceed the labeled growth stages. Use sufficient volume (5-40 GPA) and pressure (40-60 psi) to ensure complete coverage. Apply at least 55 days before harvest. Maximum season use rate is 48 oz./A.
sethoxydim @ 0.1-0.3 lbs/A	Poast @ 0.5-1.5 pt/A Apply with COC @ 2 pt/A Pump up sprayer: 1.3-2 oz/gal Poast + 1.3 oz/gal COC	Annual and perennial grasses	Apply actively growing grasses before they exceed labeled heights; consult label. Adjust pressure (40-60 psi), volume (5-20 GPA) and boom height to ensure thorough coverage. Don't apply more than 2.5 pt./A per season. COC should be used with caution because of potential leaf injury when temperature exceeds 90 F and the relative humidity is 60% or higher or anytime the temperature exceeds 100 F. Rainfast in 1 hour. Apply at least 30 days before harvest.
clethodim @ 0.1 - 0.125 lb/A	Select @ 6 - 8 oz/A Select Max @ 9-16 oz/A Apply with COC at 1 gal/100 gal Pump up sprayer: 0.33 to 0.66 oz/gal Select + 1.3 oz/gal COC	Annual and perennial grasses	Apply to actively growing grasses. Rates vary by grass species and stage; consult label. Rainfast in 1 hour. Apply at least 30 days before harvest.

VEGETABLE WEED MANAGEMENT

TOMATO^{4,5,6,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PREPLANT/PREPLANT INCORPORATED:			
S-metolachlor @ 0.95-1.58	Dual Magnum, Charger Basic @ 1.0-1.33 pt/A on coarse soil 1.33-1.67 pt/A on med-fine soil	Many small-seeded grasses, yellow nutsedge, pigweed	Incorporate before transplanting or apply to the top of pressed bed as the last step before laying plastic. Minimize soil disturbance while transplanting. Do not plant when wet, cool and unfavorable growing conditions exist. S-metolachlor may damage weak transplants.
halosulfuron-methyl @ 0.024-0.048 lbs/A	Sandea 75 DF or Profine 75 DF @ 0.5-1.0 oz/A	Yellow and purple nutsedge and some broadleaf weeds	Apply before transplanting to soil surface. For applications under plastic; apply to preformed beds just prior to laying plastic mulch. Delay transplanting at least 7 days. Use the 1 oz./A rate for row middles. Do not make more than 2 applications. Do not apply more than 2 oz./A/12 months.
metribuzin @ 0.25- 0.5 lb/A	Sencor 4 L @ 0.5-1 pt/A Sencor DF, Metribuzin DF @ 0.33-0.66 lb/A DF	Many broadleaf weeds and some grasses	Apply preplant incorporate; apply dosage in 10-40 GPA as a broadcast spray to the soil surface immediately before transplanting. Incorporate 2-4 inches deep with equipment mixing the chemical into the soil. Check label for tank-mixes.
pendimethalin @ 0.75-1.5 lb/A	Prowl H2O @ 1.0-1.5 pt/A on coarse soil 1.5-2.0 pt/A on medium soil 1.5-3.0 pt/A on fine soil	Small-seeded annual grasses and many broadleaf weeds	Apply before transplanting. Do not use under plastic mulch. If rainfall does not occur to activate herbicide, mechanical incorporation will be beneficial.
pebulate @ 4-10 lb/A	Tillam 6-E @ 2.66-6.66 qt/A	Some broadleaf weeds, annual grasses, purple and yellow nutsedge	Incorporate immediately after application. Can be used before mechanical transplanting. Check label for tank-mixes with other herbicides. Transplants may be set by hand if chemical resistant gloves are worn.
oxyfluorfen @ 0.5-1.0 lb/A	Goal 2 XL @ 1-2 pt/A	Broadleaf weeds, some grasses, Carolina geranium, cutleaf evening primrose	Plastic culture only: Apply to soil surface on preformed beds at least 30 days prior to transplanting. Incorporation is not necessary, but it may result in less crop injury. Best results are obtained if plastic is applied soon after application.
trifluralin ² @ 0.5-.1.0 lb/A	Treflan HFP, Trifluralin, Trilin, and other 4 EC products @ 1 pt/A on light soil 1.5 pt/A on med 2.0 pt/A on heavy soil 60 DF products @ 0.87 lb/A on light soil 1.33 lbs/A on medium soil 1.66 lbs/A on heavy soil	Many small-seeded annual grasses, broadleaf weeds and seedling johnsongrass	Incorporate thoroughly into top 2 inches of soil just before planting. Check label for tank-mixes with other herbicides.

VEGETABLE WEED MANAGEMENT

TOMATO^{4,5,6,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
POSTEMERGENCE:			
rimsulfuron @ 0.25-0.5 oz/A	Matrix 25 WDG @ 1-2 oz/A Apply with NIS @ 1 qt/100 gal	Most broadleaf weeds	Apply after the tomato plants have 2 true leaves. Weeds should be no more than 1 inch tall and actively growing. Do not apply within 45 days of harvest. See label for further instructions.
sethoxydim @ 0.1-0.3 lbs/A	Poast @ 0.5-1.5 pt/A Apply with COC @ 2 pt/A Pump up sprayer: 1.3-2 oz/gal Poast + 1.3 oz/gal COC	Annual and perennial grasses	Apply actively growing grasses before they exceed labeled heights; consult label. Adjust pressure (40-60 psi), volume (5-20 GPA) and boom height to ensure thorough coverage. Don't apply more than 4.5 pt./A per season. COC should be used with caution because of potential leaf injury when temperature exceeds 90 F and the relative humidity is 60% or higher, or anytime the temperature exceeds 100 F. Rainfast in 1 hour. Apply at least 20 days before harvest.
halosulfuron @ 0.024-0.048 lb/A	Sandea 75 DF or Profine 75 DF @ 0.5-1.0 oz/A Apply with NIS @ 1 qt/100 gal	Yellow and purple nutsedge and broadleaf weeds	Apply overtop 14 days after transplanting before bloom. If direct seeded apply after the 4-leaf stage before first bloom. Use shields to minimize crop contact after bloom. Can be applied to row middles at 1 oz./A; avoid contact with crop and/or plastic. If a second application is needed for nutsedge, spot treat only weed infested areas. Do not make more than 2 applications. Do not use more than 2 oz./A/12 months. Apply at least 30 days before harvest.
clethodim @ 0.1 - 0.125 lb/A	Select @ 6 - 8 oz/A Select Max @ 9-16 oz/A Apply with COC at 1 gal/100 gal Pump up sprayer: 0.33 to 0.66 oz/gal Select + 1.3 oz/gal COC	Annual and perennial grasses	Apply to actively growing grasses. Rates vary by grass species and stage; consult label. Rain fast in 1 hour. Apply at least 20 days before harvest.
metribuzin @ 0.25-0.5 lb/A	Sencor 4L @ 0.5-0.75 pt/A Sencor DF, Metribuzin DF @ 0.33-0.5 lb/A DF	Many broadleaf weeds and annual grasses	Do not use on seeded crops before the 5- to 6-leaf stage. Do not use on transplants until they have recovered and new growth is evident. Apply in 20 or more gal. of water. Allow 14 days between applications to avoid severe injury. Do not apply within 24 hours or mix with other pesticides. Do not use more than 1.33 lb./A/season or apply 1.33 lb./A within a 35-day period unless a portion of that is directed. Do not use hot caps within 7 days of application or anytime afterwards. Do not apply within 3 days of cool, wet or cloudy weather. Apply at least 7 days before harvest.

VEGETABLE WEED MANAGEMENT

TOMATO^{4,5,6,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
DIRECTED POSTEMERGENCE:			
carfentrazone-ethyl @ 0.012-0.024 lb/A	Aim 2 EC @ 0.75-1.5 oz/A Aim 40 DF @ .33-1.0 oz/A Apply with NIS @ 2 pt/100 gal or COC @ 1 gal/100	Most emerged broadleaf weeds; no grass control; can be mixed with grass herbicides	Direct applications using hooded sprayers. Injury will occur if crop is sprayed. Most effective when weeds are less than 4 inches tall. Coverage is critical.
S-metolachlor @ 0.95-1.58 lb/A	Dual Magnum, Charger Basic @ 1.0-1.33 pt/A on coarse soil 1.33-1.67 pt/A on med-fine soil	Many small-seeded grasses, yellow nutsedge and pigweed; will not control emerged weeds	Apply as a directed spray after the first rain or irrigation settles soil around transplants. Minimize contact with transplants. Apply in 20 GPA of water. Apply at least 90 days before harvest. May damage weak transplants. May be applied to row middles. Do not exceed the maximum allowed rate on label.
paraquat @ 0.49 lb/A	Gramoxone Inteon @ 2 pt/A Firestorm, Parazone @ 1.3 pt/A Apply with NIS @ 1 pt/100 gal or COC @ 1 gal/100 gal Pump up sprayer: 0.50 oz/gal paraquat + 0.33-0.5 oz/gal NIS or 1.3 oz/gal COC	Emerged small, annual broadleaf weeds and grasses; top kill and suppression of perennials	Apply to row middles using shields or hooded sprayers. Apply when weeds are 1-6 inches high. 30 days to harvest. Use 20-100 GPA. Do not exceed 30 psi nozzle pressure or spray under conditions that may cause excessive drift. Don't apply more than 3 times per season. Do not feed or graze treated areas.
metribuzin @ 0.5-1 lb/A	Sencor 4L @ 1-2 pt/A 4L Sencor DF, Metribuzin DF @ 0.66-1.33 lb/A	Many broadleaf weeds and annual grasses	Direct spray on established tomatoes; avoid contact with foliage. This treatment is recommended for fields with a history of heavy weed pressure or difficult to control weeds. See "POSTEMERGENCE" section for precautions.
carfentrazone-ethyl @ 0.012-0.024 lb/A	Aim 2 EC @ 0.75-1.5 oz/A Aim 40 DF @ .33-1.0 oz/A Apply with NIS @ 2 pt/100 gal or COC @ 1 gal/100	Most emerged broadleaf weeds No grass control; can be mixed with grass herbicides	Direct applications using hooded sprayers. Injury will occur if crop is sprayed. Most effective when weeds are less than 4 inches tall. Good coverage is important to maximize weed control.
trifluralin ² @ 0.5-.1.0 lb/A	Treflan HFP, Trifluralin, Trilin, and other 4 EC products @ 1 pt/A on light soil 1.5 pt/A on med 2.0 pt/A on heavy soil 60 DF products @ 0.87 lb/A on light soil 1.33 lbs/A on medium soil 1.66 lbs/A on heavy soil	Many small-seeded annual grasses, broadleaf weeds and seedling johnsongrass	Apply as a directed spray between rows and beneath plant and incorporate. Check label for tank-mixes with other herbicides.

VEGETABLE WEED MANAGEMENT

TOMATO^{4,5,6,7}

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
DIRECTED POSTEMERGENCE continued:			
trifloxysulfuron-sodium @ 0.0047-0.0094 lb/A	Envoke 75 DG @0.1-0.2 oz/A Apply with NIS @ 1 qt/100 gal	Nutsedge and broadleaf weeds	Apply as a directed spray on tomatoes grown on plastic. Crop should be transplanted for 14 days before application. Make application before fruit set and 45 days before harvest. See label for information on tank-mixes with other herbicides.
pendimethalin @ 0.75-1.5 lb/A	Prowl H ₂ O @ 1.0-1.5 pt/A on coarse soil 1.5-2.0 pt/A on medium soil 1.5-3.0 pt/A on fine soil	Small-seeded annual grasses and many broadleaf weeds	Direct spray to row middles, avoiding contact with foliage or stems. If rainfall does not occur to activate herbicide, mechanical incorporation will be beneficial. Do not apply within 70 days of harvest.

VEGETABLE WEED MANAGEMENT

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
⁴ paraquat @ 0.49 lb/A	Gramoxone Inteon @ 2 pt/A Firestorm, Parazone @ 1.3 pt/A Apply with NIS @ 1 pt/100 gal or COC @ 1 gal/100 gal Pump up sprayer: 0.50 oz/gal paraquat + 0.33-0.5 oz/gal NIS or 1.3 oz/gal COC	Emerged small, annual broadleaf weeds and grasses; top kill and suppression of perennials	Apply before planting in a minimum of 20 GPA to ensure good coverage. Minimize soil disturbance when planting. Labeled crops are beans, carrots, cole crops, cucumbers, eggplant, greens, lettuce, melons, onions, peppers, Irish potatoes, pumpkins, squash, sweet corn and tomatoes.
⁵ oxyfluorfen @ 0.5-1.0 lbs/A	Goal @ 1-2 pt/A	Broadleaf weeds, some grasses, geranium, cutleaf evening primrose.	Fallow bed treatment for carrots, Irish potatoes, onions, cabbage, cauliflower, pepper, tomato, cantaloupe, squash, watermelon, other cucurbits, broccoli and garlic. Apply to clean, smooth beds in the fall. Must be activated by 0.25 inch of rainfall. Consult label for planting intervals. Beds must be worked at least 2 inches deep before planting.
⁶ paraquat @ 0.6-0.94 lb/A	Gramoxone Inteon @ 2.4-3.7pt/A Firestorm, Parazone @ 1.6-2.5 pt/A Apply with NIS @ 1 qt/100 gal	Emerged small, annual broadleaf weeds and grasses; top kill and suppression of perennials	Apply after harvest to desiccate vegetable crop residue. Can be used on all vegetable crops. Thorough coverage is required. Do not feed treated crop to animals or humans. Do not allow livestock to graze treated areas.
⁷ carfentrazone-ethyl @ 0.012-0.024 lb/A	Aim 2 EC @ 0.75-1.5 oz/A Aim 40 DF @ .33-1.0 oz/A Apply with NIS @ 2 pt/100 gal or COC @ 1 gal/100	Most emerged broadleaf weeds; no grass control; can be mixed with other herbicides	Apply before planting. Can be used on all vegetable crops. Most effective when weeds are less than 4 inches tall. Good coverage equals good weed control. Can be mixed with other burndown materials.

¹Apply specific dosage of herbicide in 50-100 GPA.

²Better results have been obtained with incorporated herbicides when chemicals are applied broadcast and incorporated at the correct depth. The row should then be pulled up and planted.

³Beans, beets, carrots, cole crops, garlic, greens, lettuce, okra, onions, Irish potatoes, spinach, sweet corn and sweet potatoes. Various brands of glyphosate: Rattler, Touchdown, Glyphomax, Glyphosate, Roundup Ultramax, Roundup Ultra. Check product label for rates. May be used before planting or before crop emergence. Applications should be made on spray to wet basis, but not to point of runoff. Prior to transplanting crops into plastic mulch, remove product residue from plastic.

PASTURE AND FORAGES WEED MANAGEMENT

PASTURE and FORAGES

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PERMANENT PASTURES WITH WHITE OR LADINO CLOVER:			
2,4-D amine @ 0.75-1.0 lb/A	2,4-D Amine @ 1.5-2.0 pt/A Apply in 10-20 GPA by ground or 2-5 GPA by air	Dock, plantain, bull thistle, buttercup, other winter or spring growing broadleaf weeds. Bitterweed, fleabane, ragweed, marsh elder, goatweed, pigweed and many other summer growing broadleaf weeds	Apply when weeds are small in Oct. and Nov. and/or Feb. and March. May be sprayed in the summer and early fall if no 2,4-D susceptible plants are nearby. Fall spraying of dock is most effective. A second application may be required for complete kill at these rates. Do not apply 2,4-D if temperature is below 65 F. Some injury can be expected to established white or ladino clover. Do not apply 2,4-D in fall prior to seedling clover. Spray these weeds in the spring if cotton or other phenoxy susceptible crops are not nearby. Use the higher rate for fall spraying of more mature weeds.
2,4-D amine @ 1.0-2.0 lb/A	2,4-D Amine @ 1.0 - 2.0 qt/A Apply in 10-20 GPA by ground or 2-5 GPA by air	Cypressweed, dog fennel, common mullein, jimsonweed	Apply when weeds are small, usually from April to June; but can be applied all summer and into early fall. Rates in excess of 1.0 lb Amine or 0.5 lb LVE 2,4-D will kill or severely injure clover. Lower rates of 2,4-D will control these weeds in seedling stage but higher rates required for more mature weeds.
paraquat @ 0.25 lb/A	Various @ 16 oz/A Apply with NIS @ 1.0 qt/100 gal	Little barley and annual broadleaf weeds such as buttercup, wild geranium, etc.	Apply during the winter before bermudagrass breaks dormancy. Do not cut hay or graze within 40 days after treatment. If little barley is present, apply just before head emerges from boot.
PERMANENT PASTURE WITHOUT LEGUME:			
<i>Herbicide treatments suggested for use on permanent pastures with clovers can also be used on permanent pastures without clovers.</i>			
2,4-D LVE @ 1.0 lb/A	2,4-D LVE @ 1.0 qt/A Use 20 GPA and apply with NIS @ 1 pt/100 gal water	Wild garlic and wild onions	Spray in late fall (Oct. & Nov.) and during Feb. or early March. All legumes will be killed. Two applications for 2 to 3 years will be necessary for control. DO NOT GRAZE DAIRY COWS ON TREATED AREAS WITHIN 7 DAYS OF APPLICATION .
metsulfuron methyl @ 0.14 oz/A	Ally 60 DF, Farmsaver, Metsulfuron methyl @ 0.3 oz. Apply with NIS @ 1 qt/100 gal	Bahigrass; some broadleaf weeds	Apply when weeds are actively growing. For use on common and hybrid bermudagrass; no grazing restriction.
sulfosulfuron @ 0.06 to 0.09 lb/A	Marekick/Outrider at 1.3 to 2.0 oz/A Apply with NIS @ 0.25 % v/v	Johnsongrass; many sedges	Do not exceed 2.66 oz./A per season.
aminopyralid @ 0.06-0.11 lb/A	Milestone @ 4.0-7.0 oz/A	Horsenettle, tropical soda apple, green briar	Apply when weeds are actively growing. Effective on young weeds where no soil residual is desirable.
aminopyralid @ 0.06 to 0.11 lb/A + 2,4-D at 0.5 to 0.9 lb/A	GrazonNext HL @ 1.2 to 2.1 pt/A	Horsenettle, thistles, tropical soda apple; some other broadleaf weeds	GrazonNext HL will severely injure legumes. Follow label restrictions concerning replanting legumes into treated area.

PASTURE AND FORAGES WEED MANAGEMENT

PASTURE and FORAGES

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PERMANENT PASTURE WITHOUT LEGUME: continued			
dicamba @ 0.25-0.5 lb/A	Banvel, Clarity @ 0.5-1.0 pt/A Apply in 10-20 GPA; see label for surfactant	Most broadleaf weeds and small brush	Apply when weeds are actively growing. Do not use seed from treated grass for food or feed purposes. Do not graze meat animals within 30 days of slaughter. Do not graze dairy animals within 7 days at 0.5 lb./A or within 21 days @ 1.0 lb./A. Dairy animals should not be fed dry hay from treated area within 5 days.
metsulfuron methyl @ 0.19-0.75 oz/A + dicamba @ 0.13-0.50 lb/A + 2,4-D @ 0.36-1.44 lb/A	Cimarron Max @ 0.25-1.0 oz/A Part A + 1.0-4.0 pt/A Part B Apply with NIS @ 1 qt/100 gal or COC @ 1 gal/100gal	Most broadleaf weeds and bahiagrass; higher rates on more difficult-to-control weeds	Apply when weeds are actively growing. For use on bermudagrass. Do not use on bahiagrass or temporary grass pastures. Do not use in 2,4-D restricted areas. Consult label for tolerance to other grass crop species.
triclopyr @ 0.25 lb/A + 2,4-D @ 0.50 lb/A	Crossbow @ 1.0 qt/A	Most broadleaf weeds; also effective on briars and multiflora rose	Apply in spring and summer. Do not use where dairy cattle will graze. Remove livestock from treated area at least three days before slaughter.
picloram @ 0.125-0.25 lb/A + 2,4-D @ 0.50-1.0 lb/A	Grazon P+D, Hired Hand P+D, or Picloram +D @ 2.0-4.0 pt/A	Most annual and perennial broadleaf weeds	Apply when weeds are small and actively growing. Good control of hard to kill weeds, especially dogfennel and horsenettle. Good control of Chinese tallow. Limited grazing restrictions. Do not apply around desirable trees and shrubs.
dicamba @ 0.13- 0.26 lb/A + diflufenzopyr @ 0.05-0.10 lb/A	Overdrive @ 4.0-8.0 oz/A Apply in 10-20 GPA with NIS @ 1 qt/100 gal	Pigweed, buttercup, horsenettle, broadleaf dock, other broadleaf weeds	Apply when plants are actively growing. Useful in many pasture situations. Recommended for use in 2,4-D restricted parishes and areas.
triclopyr @ 0.28-0.56 lb/A + fluoxpyr @ 0.09-0.18 lb/A	PastureGard HL @ 0.75-1.5 pt/A Apply in 10-20 GPA with NIS @ 1-2 qt/100 gal	Most annual and perennial broadleaf weeds.	Can be used in 2,4-D restricted or banned areas. Do not use on forages grazed or fed to lactating dairy animals. Do not harvest hay for 14 days after application.
imazapic @ 0.0625-0.093 lb/A	Plateau, Panoramic @ 4-6 oz/A	Johnsongrass, annual ryegrass, little barley, dallisgrass, vaseygrass and some broadleaves	Apply when bermudagrass is dormant or after full greenup. Safe on common bermudagrass and the following hybrids: Coastal, Alecia, Russel and Tifton. All hybrids have not been tested. DO NOT apply during greenup in the spring. Severe stunting and growth reduction will occur. Add 1-2 pt./A 2,4-D for additional broadleaf control if needed. No grazing restriction, 7 day haying restriction.
tebuthiuron @ 1.0-4.0 lb/A	Spike 20 P @ 20 lb/A	Most woody plants	Apply anytime grass is dormant. Can cause temporary damage to grasses. Spot treat where possible. Do not use in vicinity of desirable trees.

PASTURE AND FORAGES WEED MANAGEMENT

PASTURE and FORAGES

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
PERMANENT PASTURE WITHOUT LEGUME: continued			
triclopyr @ 1.0-1.5 lb/A	Remedy/Remedy Ultra @ 1.0-2.0 qt/A	Most woody brush; can be mixed with 2,4-D to increase spectrum	Apply when brush is fully leafed out. Good control of Chinese tallow and berry briars. Good fencerow treatment. A 14-day grazing restriction for lactating dairy cows. No grazing restrictions for other livestock at recommended rates. Can be used in 2,4-D-restricted areas.
picloram @ 0.22 - 0.44 lb/A + fluroxpyr @ 0.18-0.36 lb/A	Surmount @ 1.5-3 pt/A Apply in 10-20 GPA with NIS @ 1-2 qt/100 gal - by ground	Good control of most hard-to-control woody species	Apply when weeds are actively growing. Can be used in 2,4-D-restricted or banned areas. Do not use on forages grazed or fed to lactating dairy animals. Do not harvest hay for 7 days after application. Livestock must be withheld for 3 days prior to slaughter.
picloram – see comments	Tordon 22K – see comments	Waxmyrtle and eastern red cedar	Apply in spring or fall. Apply as a spot treatment. Use 3 ml. (cc) of undiluted Tordon 22K per 3 ft. of plant height. Follow grazing restrictions.
hexazinone @ 0.75 lb/A	Velpar @ 3.0 pt/A	Smutgrass and certain broadleaf weeds	Apply when smutgrass is actively growing. For use on bermudagrass and bahiagrass pastures. Do not use on other desirable vegetation. Observe grazing restriction.
dicamba @ 0.13-25 lb/A + 2,4-D amine @ 0.37-0.75 lb/A	Weedmaster @ 1-2 pt/A OR Banvel, Clarity @ 0.25-0.50 pt/A + 2,4-D amine @ 0.75-1.5 pt/A	Several young broadleaf weeds	Apply when weeds are actively growing. Consult label for weed species controlled by the different rates and for grazing and hay making restrictions of treated forage.
nicosulfuron @ 0.56-.84 + metsulfuron methyl @ 0.15-.23 oz/A	Pastora @ 1.0-1.5 oz/A Add 0.25% v:v nonionic surfactant.	Many annual and perennial grasses and broadleaf weeds	FOR BERMUDAGRASS ONLY! May be applied in season or as a late winter dormant application. In season application may result in temporary stunting of the bermudagrass. Dormant season application has provided good control of ryegrass and other winter weeds.
quinclorac @ 0.3-0.5 lb/A	Facet L @ 26-43 oz/A Add crop oil, methylated seed oil, or nonionic surfactant as per label instructions.	Barnyardgrass, crabgrass, broadleaf signalgrass	FOR BERMUDAGRASS ONLY! Provides both pre- and postemergence control depending on size of grass and rate applied. Follow label for application rates. Do not cut for hay within 7 days of application; no grazing restriction following application.

NOTE: Herbicide treatments recommended on permanent pastures are also recommended for bermudagrass. Do not apply above-mentioned herbicides to temporary broadleaf pastures such as alyce clover, peas, vetch or clover. Currently, no herbicides are recommended for temporary broadleaf pastures.

PASTURE AND FORAGES WEED MANAGEMENT

FORAGE SORGHUM OR SORGHUM SUDAN HYBRIDS			
atrazine @ 1.6-2.0 lb/A	AAtrex 4L @ 3.2-4.0 pt/A AAtrex 80W @ 2.0-2.5 lb/A AAtrex Nine-O @ 1.7-2.2 lb/A	Some grasses and broadleaf weeds	Apply after planting, before crop and weeds emerge. Do not use on light soils.
2,4-D @ 1.0 lb/A	2,4-D Amine @ 1.0 qt/A	Annual broadleaf weeds	Apply after grass is well-established and broadleaf weeds are small. Do not graze lactating dairy animals within 7 days after treatment.
dicamba @ 0.13-0.25 lb/A + 2,4-D amine @ 0.37-0.75 lb/A	Weedmaster @ 1.0-2.0 pt/A	Same as above	Same as above
BERMUDAGRASS ESTABLISHMENT (sprigging only):			
diuron @ 0.8-2.4 lb/A	Diuron 80 WP @ 1.0 to 3.0 lb Diuron 4L@ 1.6 to 4.8 pt/A	Many grasses and weeds; including crabgrass, pigweeds, morningglories	At sprigging only on sprigs placed at least 2 inches deep. May temporarily burn emerged bermudagrass and can severely injure variety Alicia.
ALFALFA			
benefin @ 1.12 - 1.5 lb/A	Balan 1.5/gal @ 3.0 qt/A on light soil 4.0 qt/A on heavy soil	Most annual grasses and many of the small- seeded broadleaf weeds	Apply 2-3 weeks before planting up to planting. Incorporate thoroughly into upper 2-3 inches of soil immediately after application.
EPTC @ 3.0 lb/A	Eptam or GENEP @ 2.0 qt on all soils	Most annual grasses and broadleaf weeds and fair control of nutsedge	Apply just before planting. Incorporate thoroughly into upper 2 inches of soil immediately after application.
2,4-DB amine @ 1.0 lb/A	Butoxone or Butyrac @ 2.0 qt in 20 - 40 gal water	Annual and perennial broadleaf weeds including winter weeds such as dock, henbit, chickweed.; also annual summer broadleaf weeds in the seedling stage	Apply After alfalfa seedlings have 2 or more true leaves and weeds are in seedling stage. Do not graze or feed treated fields to livestock within 30 days after application. This material is similar to 2,4-D; therefore, apply so as to avoid drift.
sethoxydim @ 0.28 - 0.47 lb/A	Poast @ 1.5 - 2.5 pt/A + 2 pt/A COC in 5 - 20 gal water	Annual and perennial grasses	Apply before grasses exceed height limitations. Control generally better if application is made prior to cutting. Height limitations vary with the grass to be controlled. Follow label.
clethodim @ 0.125 - 0.25 lb/A	Select @ 8.0 - 16.0 oz/A + 1 qt/A or 1% v/v COC	Annual and perennial grasses	Apply before grasses exceed height limitations. Addition of a spray grade nitrogen fertilizer or ammonium sulfate may further improve weed control. Refer to label.

NONCROPLAND WEED MANAGEMENT

NONCROPLAND

Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
BAREGROUND HERBICIDES:		
CBPM (Pramitol 5PS) @ 1-2 lbs/100 sq ft or Pramitol 25E @ 10-20 gal/A	Grasses and broadleaf weeds	Apply anytime to vegetation or soil. IF CBPM is used, broadcast pellets uniformly. If Pramitol 25E is used, apply in 150-200 gal. of water. For faster top-kill of existing vegetation, use diesel oil in place of water for a carrier.
Hyvar X 80% WP @ 10-25 lb/A	Grasses and broadleaf weeds	Apply in spring and summer in 150-200 gal. of water. Do not use on irrigation ditches or near desirable trees. Apply with surfactant if weeds are present.
Karmex 80% DF @ 20-60 lb/A	Woody plants	Apply before weed growth begins in 150-200 gal. of water. Use lower rates on lighter soils.
Sahara DG @ 13-1 9 lb/A	Most annual and perennial weeds	Apply at preemergence or early postemergence in 10-20 GPA of water. Always use a non-ionic surfactant or crop oil concentrate for postemergence applications.
Sodium chlorate @ 650-870 lb/A or 1.5-2 lb/100 sq ft (Atlacide)	Johnsongrass, bermudagrass; most annual and seedling plants	Apply to plants actively growing and before seed formation. Easily combustible after drying on clothes and plants. Less flammable when mixed with calcium chloride or borates.
Viewpoint @ 13-20 oz/A	Grasses, broadleaf weeds, many woody plants	Apply preemergence or postemergence to weeds. Consult label for proper rate selection.
Numerous other herbicide combinations containing borates, chlorates and/or residual compounds are available. Failure to list these in this publication does not indicate that they are ineffective as soil sterilants.		
ABATEMENT - NOT BAREGROUND:		
Arsenal and other imazapyr formulations @ 2.0 - 6.0 pt/A	Annual and perennial grasses and broadleaf weeds; some brush control	Apply at postemergence to weeds. Good residual activity. For non-cropland use only.
Garlon 4 @ 1.0-2.0 pt/A	Many broadleaf weeds; some brush species	Apply in spring and summer in 10-20 of water. Good brush control. Weak on some broadleaf weeds. Recommended for use in 2,4-D-restricted parishes and areas.
Journey @ 10.7-16.4 oz/A	Johnsongrass, vaseygrass, certain broadleaf weeds	Apply in spring and summer in 10-20 gal. of water with 0.5% V/V surfactant. Use at higher rate in spring for bermudagrass release on noncrop areas where bahiagrass is not desirable. Lower rate may or may not control bahiagrass. Use in combination with mowing for best results.
Karmex 80DF @ 5-10 lb/A	Johnsongrass, other grasses, most annual and perennial broadleaf weeds	Apply in late winter or early spring in 100-150 gal. of water. Can be applied to fence rows including pasture fences for season-long weed control.
Karmex 80 DF @ 3.0 lb/A + MSMA @ 3.0 lb/A	Johnsongrass, dallisgrass and most annual grasses and broadleaf weeds	Apply in the spring after grasses and broadleaf weeds are growing in 50 gal./A. Hyvar more effective on heavy or clay soil. Apply as a spray to remove grasses and weeds when a bermudagrass sod is desired. Dry ditches, turn rows and fences except around pastures. Do not apply products containing arsenic along pasture fences. Add 0.50% non-ionic surfactant.
Hyvar X 80WP @ 1.5 lb/A + MSMA @ 3.0 lb/A		

NONCROPLAND WEED MANAGEMENT

NONCROPLAND

Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
ABATEMENT - NOT BAREGROUND continued:		
Oust XP @ 3-12 oz/A	Annual and perennial broadleaf weeds and grasses	Apply preemergence or early postemergence. May be used up to 10 oz./A for bermudagrass "release" in noncrop areas. Avoid runoff onto cropland. Specific labels exist for the tank-mix of Roundup plus Oust XP for bermudagrass release.
Outrider @ 1.3 oz/A	Johnsongrass	Apply at early postemergence. For bermudagrass and bahiagrass, release on roadsides and other non crop areas. Apply with 0.5% surfactant.
Overdrive @ 4.0 -8.0 oz/A	Many broadleaf weeds.	Apply in spring and summer in 10-20 gal. water.
Plateau @ 7 - 10 oz/A	Johnsongrass, vaseygrass; certain broadleaf weeds	Apply at early postemergence for bermudagrass release on roadsides and other noncrop areas. Apply with 0.5% surfactant.
Roundup Ultra/Pro OR other glyphosate formulations ¹ (4 lb/gal) @ 1 - 5 qt/A	Annual and perennial broadleaf weeds and grasses	Apply to actively growing weeds. Use 1-1.5 pt./A for bermudagrass release. High rates give nonselective control. Roundup Pro and Oust XP are currently registered to be tank-mixed at 1.0 pt plus 1.0 oz. Oust XP/A for bermudagrass release in noncropland areas.
Spike 80WP @ 5-20 lb/A	Annual and perennial broadleaf grasses and woody plants	Apply in winter and early spring in 100-200 gal. of water. Use high rates for perennial grasses and woody plants. Don't use on fence rows.
Ureabor @ 1-3 lb/100 sq ft.	Annual and perennial broadleaf weeds	Apply when weeds are actively growing. Noncrop areas only. Can be applied dry or dissolved in water to spray.
Streamline @ 1.7-9.5 oz/A	Most broadleaf weeds and bahiagrass	Apply at full-leaf, avoid drift to desirable plants. Can be used in certain unimproved turf and roadside applications. Consult label for proper rate and weed selection. Apply when weeds are actively growing. Add 0.25 % v:v non-ionic surfactant..
Milestone @ 4.0-7.0 oz/A	Most broadleaf weeds	
VEGETATION CONTROL UNDER ASPHALT PAVEMENT: CAUTION – Vegetation such as trees and shrubs may be damaged or even killed if their roots grow into the herbicide-treated soil.		
CBM (Sodium chlorate + sodium metaborate) @ 240 gal/A	All weeds controlled	Apply just ahead of prime coat in 200 gal. of water/A. Weeds from adjacent areas may grow under edge of pavement.
Hyvar XL @ 12 gal/A or Hyvar X @ 30 lb/A	All grasses, sedges, broadleaf weeds	Apply after shaping and prior to compacting. After spraying incorporate into the top 6 inches of material with rotary equipment.
Pramitol 25E @ 25 gal/A or Pramitol 80 WP @ 60 lb/A	Same as above	Same as above. Do not apply Pramitol under asphalt coating less than 3 inches.
Treflan @ 3.0 - 4.0 gal/A	Grasses and some broadleaf weeds	Same as above. Use sufficient water to ensure thorough wetting of the soil.
Spike 80W @ 5.0 - 20.0 lb/A	Broadleaf weeds and grasses	Same as above. Rate depends on weeds to be controlled. See label.
WEEDS IN EXISTING ASPHALT PAVEMENTS:		
Roundup Ultra, Roundup Pro, others @ (4 lb/gal) 5 qt/A	Same as above	Apply in 10-40 gal. of water. Use 2 oz./ gal. of water per 1,000 sq ft. to control annual grasses. Bermudagrass, nutsedge, other perennial weeds, use 3 oz. per gallon water per 1,000 sq. ft.)

NONCROPLAND WEED MANAGEMENT

NONCROPLAND

Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
<p>Other treatments listed for soil sterilization also can be used to treat the soil under pavement. Hyvar is more effective in controlling nutsedge than many of the other herbicides listed. All of the soil sterilization treatments, except TCA, may injure vegetation some distance from the edge of the pavement. Hyvar, Karmex, AAtrex, Pramitol may injure trees adjacent to the treated area.</p>		
FOLIAGE TREATMENTS NONSELECTIVE – GRASSES AND BROADLEAF WEEDS		
Arsenal and other imazapyr formulations @ 2.0 - 6.0 pt/A	Annual and perennial grasses and weeds; some brush species.	Apply in 30-50 gal. water/A. Good residual activity.
Finale @ 3.0 - 6.0 qt/A	Annual and perennial grasses and broadleaf weeds	Apply in 20 gal. water/A. No residual activity. Fast acting.
Herbicide Naphtha	Annual grasses and broadleaf weeds; top kill of perennial weeds	Apply in 50-100 gal/A. Regrowth will occur from roots; other annual weeds will probably appear. Repeat as needed.
FOLIAGE TREATMENTS NONSELECTIVE - GRASSES AND BROADLEAF WEEDS: continued		
Roundup Ultra/Pro, others @ (4 lb/gal) 2 - 5 qt/A	Annual and perennial weeds	Apply in 10-40 gal. water per acre. Apply 1% solution to annual weeds and johnsongrass (1 1/4 oz. Roundup/gal). Apply 2% solution to bermudagrass and nutsedge (2 1/2-3 oz. Roundup/gal).

¹ See "Appendix A" for more information on several glyphosate products and formulations.

WOODY PLANTS WEED MANAGEMENT**WOODY PLANTS AND FORESTRY**

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
TREE INJECTOR:			
2,4-D amine	Various products ((4 lb/gal) @ 1.0-2.0 ml (cc) in spring and early summer at 1-2 inch intervals	Most oaks, hickory, pecan, hawthorn, elm, waterlocust. Hard-to-kill trees require continuous cuts.	Apply in all seasons but best results are in spring and early summer. Rates apply to trees 4-9 inches in diameter measured at breast height (DBH). The injector bit must penetrate inner bark. Make each injection at ground line (473 ml = 1 pt). Hatchet and squirt bottles may also be used.
imazapyr @ 2 lb/gal	Chopper 8 - 12 fl oz/gal water or diesel. Apply 1 ml per injection or cut at 1" interval	Most hardwoods. Pines are resistant.	Apply year round. Legumes (locusts) are not controlled
glyphosate @ 4 lb/gal	glyphosate @ 1 ml per 2-3" DBH	Oaks, sweetgum, poplar, sycamore	Apply From full-leaf expansion until leaf drop in fall. The injector bit must penetrate inner bark.
2,4-D amine plus picloram	Tordon 101R or RTU @ 1.0 ml of undiluted material inject at 2-3" intervals.	Most species	Best results in spring and summer. Maple, blackgum, hollies, hickory and dogwood are more difficult to control. To control these species, apply in continuous cut.
APPLIED TO SOIL:			
tebuthiuron @ 1-4 lb/A	Spike 20P @ 5 - 20 lb/A Spike 80WP @ 1.25 - 6.0 lb/A	Most woody brush and trees	Apply anytime the ground is not frozen. Distribute pellets uniformly.
imazapyr @ 0.5 to 1.0 lb/A	Chopper or Chopper Gen 2 at 1.0 to 2.0 qt/A	Weeds, vines, woody brush	For site preparation prior to replanting pines, follow label for tolerances to different pine species. .
imazapyr 0.5% + diuron 2.0 G	Topsite 2.5G @ 200 lb/A	Most species	Apply year round. Some legumes are resistant.
hexazinone @ 3.6-6.3 lb/A	Velpar 90SP @ 4-8 lb/A Velpar L @ @ 1.8- 3.6 gal WK or Pronone 10G @ 5 -30 lbs/A	Willow, oak, gum; other trees and brushes	Apply between later winter and early summer. Apply Velpar in 50-200 gal. of water, plus surfactant with handgun as individual stem treatments or as narrow bands 4-6 feet apart. Follow instructions on label. Apply Pronone 10G by hand or with spreader.
hexazinone @ 3.6-6.3 lb/A	Velpar L undiluted @ 4-8 ml per 2" stem diameter.	Willow, oak, maple, other trees and brushes	Apply between late winter and early summer. Apply by "spot gun" to the soil at base of the stem.
BASAL BARK TREATMENT:			
triclopyr @ 1 lb/gal+ 2,4-D @ 2 lb/gal	Crossbow @ 115 oz/gal plus Penetrator or Cide Kick @ 13 fl oz/gal; makes 1 gal finished spray	Same as above. Very effective on briars and multiflora rose.	Same as above. Apply as basal spray or with spot gun as thin line solid stream at 3-5 ml/second.
triclopyr @ 4 lb/gal	Garlon 4 @ 25 oz/gal + diesel @ 90 oz/gal + Cide Kick or Penetrator @ 12 oz/gal; makes 1 gal finished pray	Most hardwoods up to 4 inches DBH; better on thin-bark species	Apply year round by hand with backpack sprayer as a narrow band or mist to lower 12 inches of stem. Also may be applied with a spot gun set to deliver 3-5 ml/sec as a solid stream. Vegetable based basal oil may be used instead of diesel.
2,4DP + 2,4D	Weedone CB @ 5 gal/A	Most southern hardwoods up to 4 inches DBH	Apply spring through fall. Apply with hand pump sprayer to lower 18 -36 inches of stem.

WOODY PLANTS WEED MANAGEMENT

WOODY PLANTS AND FORESTRY

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
FOLIAGE SPRAY:			
imazapyr @ 0.5-.5 lbs/A	Arsenal 2 EC, Arsenal Powerline @ 2.0 - 6.0 pt/A	Most woody plants, grasses, broadleaf weeds	Apply at full-leaf in spring or summer. Good residual.
imazamox @ 0.5 to 1.0 lb/A	Clearcast @ 1.0 to 2.0 qt/A plus surfactant	Effective on Chinese tallow tree and black willow; fair on sweetgum.	Only moderate injury on red oaks and hickory when applied at lower rate. Do not use nonselectively if injury to oaks, hickory and other hardwoods can't be tolerated.
dicamba @ 0.5-1 lb/A + 2,4-D @ 2.0-6 lb/A	Brush Buster @ 0.5 - 1.0 gal per 50 gal of spray by ground or 3.0 gal/A by air	See Brush Buster label	Apply after leaves are fully developed and until 3 weeks before frost. Dicamba and amine 2,4-D may be tank-mixed in the proportions listed under active ingredients. See label for precautions.
triclopyr @ 1.0-1.5 lb/A + butoxyethyl 2,4-D @ 2.0 -3.0 lb/A	Crossbow @ 1.0-1.5 gal/100 gal water	Most woody plants; especially good on briars, willow, tallow	Apply at full-leaf in spring or summer. Spray to give thorough coverage. Avoid drift to desirable vegetation.
metsulfuron methyl @ 0.04-0.16 lb/A	Escort XP @ 1 - 4 oz/A	Oaks, ash, elm, other woody species	Apply when brush is actively growing. Can be used over top of loblolly and slash pine for conifer release and preplant for site preparation.
triclopyr @ 1.0 - 2.0 lb/A	Garlon 4 @ 1.0-2.0 qt/A	Most woody plants	Apply at full-leaf in spring or summer. Spray to give thorough coverage. Avoid drift to desirable vegetation. Can be used in 2,4-D-restricted areas.
glyphosate @ 2-5 lb/A	glyphosate @ 2-5 qt/A or 1.0-2.0% solution	Many trees, brush, herbaceous weeds	Apply at later summer and fall while plants are actively growing. May be aerially applied in 5-15 GPA of water. Use 10-40 GPA water for ground rig. For percent solution, spray to wet.
fosamine @ 6-12 lb/A	Krenite @ 1 1/2-3 gal in 50 - 300 gal of water plus surfactant	Willow and certain other hardwoods	Apply in the 2-month period prior to fall leaf coloration. Ground application only on ditch banks. Read label for specific instructions.
sulfometuron methyl @ 0.09-0.36 lb/A	Oust XP @ 2-4 oz/A	Many grass and broadleaf species	When weeds are actively growing. Can be used over top of loblolly, longleaf and slash pine for conifer release and preplant for site preparation.
clopyralid @ 0.1-0.38 lb/A	Transline @ 0.25-1.0 pt/A	Good on legume species	Apply at full-leaf in spring or summer. Can be used in 2,4-D restricted areas.
fluroxypyr @ 0.14-0.25 lb/A	Vista @ 0.33-1.33 pt/A	Most herbaceous weeds and certain woody plants	Apply at full-leaf in spring or summer. Can be used in 2,4-D restricted areas.
aminocyclopyrachlor @ + 0.24-0.29 metsulfuron-methyl @ 0.08-0.09 lb/A	Streamline @ 9.5-11.5 oz/A	Most woody plants; especially good on Chinese tallow, vines, briars	Apply at full-leaf, avoid drift to desirable plants. Not for use overtop of pines for hardwood control. Can be used in 2,4-D restricted areas.
aminocyclopyrachlor @ 0.23-0.29 + metsulfuron-methyl @ 0.07-0.09 + imazapyr @ 0.32-0.40 lb/A	Viewpoint @ 16-20 oz/A	Most woody plants; also controls herbaceous weeds and grasses	Apply at full-leaf, avoid drift to desirable plants. Not for use overtop of pines for hardwood control. Can be used in 2,4-D-restricted areas.

WOODY PLANTS WEED MANAGEMENT**WOODY PLANTS AND FORESTRY**

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
CONTROL OF POISON IVY AND OTHER VINES ON TREE TRUNK			
Amitrol-T @ 3 oz/3 gal water plus 3 tablespoons surfactant			REFER TO LABEL FOR COMPLETE INSTRUCTIONS. Cut vine and spray foliage around the base of tree. Do not drench soil. Apply when ivy or other vines are in full-leaf. Prevent drift. More than 1 application may be required.
Gramoxone Max @ 7 TBS/gal water plus 1 TBS surfactant			REFER TO LABEL FOR COMPLETE INSTRUCTIONS. A nonselective, contact herbicide. Spray foliage of vine around base of tree after cutting vine. Do not allow drift to contact foliage of desirable plants. Thorough coverage of undesirable plants is necessary, but avoid drenching soil. If sprayed on the tree trunk, be sure that bark is well-developed and shows no green. Avoid excessive wetting. Even under favorable conditions injury may occur.
Roundup Ultra @ 4 - 5 qt/A broadcast or a 2.0% solution spray to wet.			Apply to actively growing plants before leaves develop fall leaf color. Repeat if required. Do not allow spray to contact desirable foliage.
Vine-X - Ready to use			Product comes ready-to-use with built-in brush type applicator tip. Follow label instructions. Excellent on poison ivy and bush killer vine. If used correctly will not injure adjacent plants.

AQUATIC WEED MANAGEMENT

AQUATIC WEEDS (Lakes and Ponds)

Formulated Product and Rate	Types of Aquatic Weed or Site	Remarks and Precautions
FLOATING WEED (unattached, tops above water):		
Galleon @ 2 to 5.6 fl oz/A + 0.25% nonionic surfactant foliar or 25 to 75 ppb total water	Water hyacinth, duckweed, common salvinia, giant salvinia*	Can be used to control floating weeds in 2,4-D-restricted areas. Also can be used as an inwater application at 25 to 75 ppb. Note! With difficult-to-control weeds like giant salvinia, a minimum 60-day contact time is required. Do not use this treatment if rapid dilution is expected.
Clearcast @ 16 to 64 oz/A + surfactant 2,4-D amine @ 4.0 lb/A in 100 gal water	Water hyacinth and common salvinia Floating mats of alligatorweed, water hyacinth	Can be used to control water hyacinth in 2,4-D-restricted areas. Apply on foliage when weeds are actively growing. Spray to uniformly wet foliage. Add .25% approved non-ionic surfactant. Repeat in 4-6 weeks. Avoid use in waters used for irrigation.
Diquat/Reward/Tribune (others) @ up to 1.0 gal/A + 1.0 qt of surfactant/100 gallons of water	Duckweeds, water hyacinth, water lettuce	Apply on foliage when weeds are actively growing. Apply as a surface spray. Follow label for water restrictions after application.
Habitat, Polaris, or Imazapyr 2SL @2-3 pts/A + 0.25 % nonionic surfactant	Duckweeds, water hyacinth, cattails, many wood species	Apply when weeds are actively growing. Follow potable and irrigation water restrictions. Must be applied by certified commercial applicator only.
Rodeo, Aquamaster, Razor, Roundup Custom or Glypro @ 4.0-6.0 pt/A plus surfactant	Water hyacinth and grasses	Rodeo, Aquamaster, Razor or Glypro 4.0-6.0 pt./A plus 0.5% approved surfactant.
Diquat/Reward (others) @ 1.0 gal/A	Common or giant salvinia	Apply 1.0 gal./A as a low or high volume spray plus 0.5% approved surfactant.
Aquamaster @ 2.0% v/v (2.5 oz/gal) +0.5% v/v approved surfactant (0.64 oz/A)	Common or giant salvinia	Spray to wet.
Clipper @ 6.0-12.0 oz/A + 0.5 v/v approved surfactant	Common or giant salvinia, water lettuce, watermeal	For use on water bodies with limited or no outflow. Contact herbicide, coverage important. Very fast acting. May be tank-mixed with 2,4-D to increase weed control spectrum.
Tradewind @ 1-2 oz/A + 0.25% nonionic surfactant	Alligatorweed, duckweed, parrotfeather and others	Can be used to control floating weeds in 2,4-D-restricted areas. Apply to actively growing weeds.
Stingray @ 3.4-13.5 oz/A + 0.25% nonionic surfactant	Common or giant salvinia, water lettuce	Fast acting. Contact herbicide, coverage important.
NOTE: A ft. (acre foot) = volume of water in an area having 1 acre of surface and a depth of 1 foot.		
EMERSED AND MARGINAL WEEDS (rooted under water, tops above water or growing on wet soil):		
Galleon @ 2 to 5.6 fl oz/A + 0.25% nonionic surfactant.	Alligatorweed, parrotfeather, other weeds	Can be used in 2,4-D-restricted areas.
Clearcast @ 16 to 64 oz/A + surfactant	Alligatorweed, parrotfeather, sedges	Can be used in 2,4-D-restricted areas.

AQUATIC WEED MANAGEMENT

AQUATIC WEEDS (Lakes and Ponds)

Formulated Product and Rate	Types of Aquatic Weed or Site	Remarks and Precautions
EMERSED AND MARGINAL WEEDS (rooted under water, tops above water or growing on wet soil) continued:		
2,4-D low volatile ester (LVE) @ 4.0 lb/A in 100 gal water	Broadleaf species (arrowhead, lotus, smartweed, spatterdock, spikerush, waterprimrose, white water lily, yellow water lily), Cuban bulrush	Apply on foliage when weeds are actively growing. Spray to uniformly wet foliage. Add 10% fuel oil by volume or 1.0 qt. surfactant to spray mix. More than 1 application may be required for control of some species. Avoid use in waters for crop irrigation.
Habitat, Polaris, or Imazapyr 2SL @ 1-6 pts/A plus 0.25% nonionic surfactant	Many grasses, rushes, sedges and broadleaf weeds. Especially useful for controlling trees and brush in water.	Apply when weeds and woody plants are actively growing. Follow potable and irrigation water restrictions. Must be applied by certified commercial applicator only.
Rodeo, Aquamaster, Razor, or Glypro @ 1.5-7.5 pt/A broadcast or 0.75-1.5% in spray to wet equipment plus 0.5% approved surfactant.	Broadleaf weeds, grasses and weedy species (cattail, maidencane, smartweed, spatterdock, willowand others)	Apply to actively growing weeds. See label for proper stage of growth. No restrictions on the use of the water. Do not apply within 0.5 mile upstream of potable water intakes or in tidewater areas.
Renovate 3 @ 2-8 qt/A in 20-200 gal water	Broadleaf weeds, brush and trees	Apply to water hyacinth, alligatorweed, water primrose and many tree species. Can be applied to impounded water only, not to flowing streams. Apply by air or ground. Add an approved aquatic surfactant at 0.5%.
SUBMERSED WEEDS (tops mostly under water, usually rooted or anchored):		
Copper sulfate @ 2.0 -3.0 lb/A ft of water	Algae (scums and mosses)	Apply at bloom. Apply crystals or powder at any stage of algae growth by any method to give rapid and uniform distribution. Repeat as necessary to maintain control. Treat only a portion of the pond at once. Apply 3.0 lb./A ft. in ponds with soft water.
Endothall Aquathol liquid @ 1.0 - 2.0 gal/A Aquathol Granular @ 125 lb–250 lb/A (water 4-6 ft)	Coontail, fanwort, hydrilla milfoil, pondweeds, naiad	Apply at active growth stage. Can be injected into the upper end of the pond or sprayed over surface of pond. Do not use fish for 3 days after treatment. Can be used for other uses within 7 days after treatment. Read the label.
Citrine-Plus @ 0.6 gal/acre ft of water	Algae (scums and mosses)	Apply at bloom. Apply as a surface spray or injection. Toxicity to fish depends on water hardness. See label for directions.
Hydrothol 191 @ 0.6-3.6 pt/A ft of water	Algae (scums and mosses)	Apply at bloom. Apply as a surface spray. Follow label instructions concerning fish toxicity.
Sonar 5P @ 10-20 lb/surface acre Sonar AS @ 1.0-2.0 pt/surface acre Avast (see label for specific rates)	Coontail, fanwort, milfoil, hydrilla, elodea, naiad, pondweeds	Apply at active growth stage. Slow kill. Effective against most rooted plants. If water is deeper than 6 feet, increase rate by 50%.
Diquat or Reward @ 1.0 - 2.0 gal/surface-acre	Coontail, naiad, milfoil, giant salvinia, common salvinia	Apply at active growth stage. Apply as a direct-pour or subsurface injection. Short residual. Water may be used for irrigation 5 days after treatment. Can be tank-mixed with copper for hydrilla control.
Aqua-Kleen granules @ 100-200 lb/A	Coontail, naiads, milfoil	Apply after weeds begin to grow in spring. Granular 2,4-D. Do not apply to water used for agricultural use or potable water supplies. Excellent for treating around docks, landings, etc.
Galleon @ 25 to 75 ppb as a total water treatment	Hydrilla and naiads	A 60-day contact time required. Do not use in moving water or where rapid dilution is expected.

AQUATIC WEED MANAGEMENT

AQUATIC WEEDS (Lakes and Ponds)

Formulated Product and Rate	Types of Aquatic Weed or Site	Remarks and Precautions
SUBMERSED WEEDS (tops mostly under water, usually rooted or anchored) continued:		
Tradewind @ 20-45 ppb	Hydrilla	Must maintain desired concentration for minimum of 60 days. Not for use in moving water.
Clipper @ 100 to 400 ppb as a total water treatment	Hydrilla, naiads, duckweed, watermeal, pondweeds, milfoils, coontail	For use in water bodies with limited or no outflow. Fast acting. Follow instructions on timing of application and possible oxygen depletion following application. Herbicide efficacy will decrease as water pH increases to 9 and higher.

AQUATIC WEED MANAGEMENT

AQUATIC WEEDS (Lakes and Ponds)

USE RESTRICTIONS for TREATED WATER (number of days)

Herbicide	Human			Animal		Irrigation	
	Drinking	Swimming	Fish consumption	Drinking	Turf	Forage	Food crops
2,4-D	21 ^e	-	-	21 ^e	21 ^e	21	21 ^{ef}
Aquathol Granular	7	1	0	7	0	7	7
Aquathol K	7-25	1	0	7-25	0	7-25	7-25
Aquazine	365	21	0	365	365	365	365
Clearcast	0 ⁱ	0	0	0	K	K	K
Clipper	0	0	0	0	5	5	5
Copper complexes	0	0	0	0	0	0	0
Copper sulfate	0	0	0	0	0	0	0
Dichlobenil ^a	-	-	90 ^b	-	-	-	-
Diquat/Reward/Tribune	2	0	0	1	2	5	5
Galleon	0	0	0	0	H	365	i
Habitat/Polaris/Imazapyr 2SL	2	0	0	0	120 ^g	120 ^g	120 ^g
Hydrothol	7-25	1	0	7-25	7-25	7-25	7-25
Rodeo/Glypro/Razor/Glypro/Roundup Custom	0	0	0	0	0	0	0
Sonar/Avast	- ^e	0	0	0	30 ^d	30 ^d	30 ^d
Tradewind	0	0	0	0	0	0	0
Stingray	1	0	0	1	k	k	k

^a Do not use in human, animal or irrigation water.

^b Not recommended for use in commercial fishing areas.

^c See label for distance allowed from potable water intakes.

^d Restriction suggested by manufacturer.

^e Shorter interval may be used depending on amount of 2,4-D acid present.

^f Do not use on irrigation ditches.

^g Or until residues = 1.0 ppb.

^h Concentration < 30 ppb.

ⁱ Concentration = 1 ppb, except rice = 30 ppb.

^j Concentration < 50 ppb within 0.25 miles of water intake.

^k See label.

RECROP INTERVALS

RECROP INTERVALS FOR VARIOUS HERBICIDES USED IN LOUISIANA

Below is a list of commonly used herbicides in Louisiana that have rotational crop restrictions. When herbicides are applied (alone, as a tank-mix, or in a sequential program), follow the recrop interval that is most restrictive for any applied herbicide. Soil pH, among other considerations, may affect herbicide selection. Extremes in environmental conditions, such as lower-than-normal temperatures and/or rainfall after herbicide application, in addition to other factors, may affect the recrop interval and may increase the potential for injury. Environmental conditions, such as temperature and rainfall after application, may affect the recrop interval. These listings are minimum intervals between herbicide application and recropping, assuming herbicide application is at the proper rate and application timing. **The label should always be consulted prior to use to determine precautions, conditions or other restrictions that may alter the recrop intervals.**

In the "Rotation Interval" column:

- A. Numbers refer to months (m), days (d) or year (yr) that must pass between herbicide application and planting the next crop.
 B. "None" indicates that no recrop interval for the following crop was stated on the label.
 C. Following spring or "2 springs following application" are self-explanatory.

Table 1. Rotation interval for corn herbicides.

Corn Herbicide Applied	Rotation Interval				
	Cotton	Grain Sorghum	Rice	Soybean	Wheat
Accent Q (depends up soil pH; check label)	10m	10 or 18m	18m	15d	4m
Anthem/Anthem ATZ	18m	18m	18m	18m	18m
Armezon/Impact	9m	9m	3m	9m	3m
Atrazine	following spring	none	2yr	following spring	1yr
Bicep II Magnum, Cinch ATZ	following spring	none	15m	following spring	3m
Callisto	10m	None	10m	10m	4m
Capreno	10m	10m (soil pH < 7.5) 18m (soil pH > 7.5)	18m	10m	4m
Clarity/Banvel	3m	none	3m	3m	none
Corvus	9m	17m (soil pH < 7.5) 24m (soil pH > 7.5)	9m	9m	4m
Dual Magnum/Dual II Magnum/Cinch	none	none	following year	none	4.5m
Halex GT	10m	none	18m	10m	120d
Harness Xtra	following year	none	following year	following year	following year
Harness	2 springs	following spring	2yr	following spring	1yr
Instigate	10m (see label)	10m (see label)	18m	10m	4m
Keystone NXT	following year	none	following year	following year	following year
Laudis	10m	10m	18m	8m	4m
Lexar EZ	following year	none	18m	following year	following year
Outlook	following year	following year	following year	none	4m
Permit	4m	2m	2m	9m	2m
Prowl 3.3EC/Prowl H ₂ O/Pendimax	none	none	none	none	4m
Realm Q	10m (see label)	10m (see label)	18m	10m	4m
Resolve Q	10m	18m	18m	10m	4m
Status	120d (see label)	120d (see label)	120d	120d (see label)	120d (see label)
Steadfast Q	10m	10-18m	10-18m	15d	4m
Zidua	4m	18m	10-24m (see label)	0-4m (see label)	4-6m (see label)

RECROP INTERVALS

Table 2. Rotation interval for cotton herbicides.

Cotton Herbicide Applied	Rotation Interval				
	Corn	Grain Sorghum	Rice	Soybean	Wheat
Assure II	4m	120d	4m	none	120d
Buctril	30d	30d	180d	180d	30d
Command 3 ME	9m	9m	9m	none	12m ¹
Cotoran/Meturon	6m	6m	6m	6m	6m
Diuron (Direx, Karmex)	4m to next yr ²	4m to next yr ²	4m to 1yr ²	4m to 1yr ²	4m to 1yr ²
Dual Magnum/Cinch	none	none	spring	none	4.5m
Envoke	7m	7m	7m	7m	3m
Fusilade DX	2m	2m	2m	none	2m
Fusion	2m	2m	2m	none	2m
Goal 2XL	10m (see 2ee label)	10m	10m	60d (see 2ee label)	10m
Liberty 280SL	0d	70d	120d	0d	70d
linuron	4m	4m	4m	4m	4m
Reflex	10m	10m	10m	none	4m
Prometryn (Caparol, Cotton-Pro)	next yr	next yr	next yr	next yr	next yr ³
Prowl 3.3 EC/Prowl H ₂ O/Pendimax	none	none	none	none	4m
Select Max/others	none	none	none	none	none
Staple LX	9m ⁴	2yr	9m	10m	4m
Suprend	next yr	next yr	next yr	next yr	next yr ³
Trifluralin	none	none	9m	none	none
Valor	30d	30d	30d	none	30d
Solicam DF	24m	24m	24m	30d	24m

¹ Wheat may be planted as a cover crop but may not be harvested for food, feed or grazed if planted less than 9 m after application.

² Interval depends on use pattern (PRE, Post, band or broadcast). Consult label for exact intervals.

³ Wheat may be planted for a cover crop the fall following application, but may not be harvested for food or feed.

⁴ Can be planted the following year if Staple LX rate was <1.8 oz./A, or if Staple LX rate was >1.8 oz./A and applied to 50% of the row and ground-tilled before corn is planted.

RECROP INTERVALS

Table 3. Rotation interval for rice herbicides.

Rice Herbicide Applied	Rotation Interval				
	Cotton	Corn	Grain sorghum	Soybean	Wheat
2,4-D	3m	none	none	following spring	none
Aim	none	none	none	none	none
Basagran	none	none	none	none	none
Beyond	9m	8.5m	9m	none	3m
Blazer	100d	100d	100d	none	40d
Bolero	6m	6m	6m	6m	6m
Broadhead	12m	12m	12m	12m	12m
Clearpath	18m	10m	18m	10m	10m
Clincher	3m	3m	3m	3m	3m
Command	none	9 m	9 m	none	12 m
Facet L	10m	10m	none	10m	none
Grandstand R	4m	4m	4m	4m	4m
Grasp	3m	3m	3m	3m	3m
GraspExtra	3m	3m	3m	3m	3m
League	8m	12m	12m	12m	12m
Londax	4m	4m	4m	4m	4m
NewPath	18m	8.5m	18m	none	4m
Obey	309d	309d	309d	309d	309d
Permit/Halomax	4m	none	2m	9m	2m
Permit Plus	4m	1m	2m	Soil dependent, see label	2m
Propanil	2 m	2m	2m	2 m	2m
Pendimethalin	none	none	10m	none	4m
RebelEx	3m	3m	3m	3m	3m
Regiment	none	none	none	none	none
RiceBeaux	2m	2m	2m	2m	2m
Ricestar HT	none	none	none	9m	none
Sharpen	1.5m at 1 oz./A 3m at 2 oz.	none	none	See label	none
Strada	6m	3m	12m	6m	3m
StradaPro	6m	3m	36m	9m	3m
StradaXT	309d	309d	309d	309d	309d

RECROP INTERVALS

Table 4. Rotation interval for soybean herbicides.

Soybean Herbicide Applied	Rotation Interval				
	Cotton	Corn	Grain Sorghum	Rice	Wheat
Authority Elite/BroadAxe	12m to 18m (see label)	10m	10m	10m	4.5m
Authority First/Sonic	12m to 18m (see label)	10m to 18m (see label)	12m	10m	4m
Authority MTZ	12m	10m/4m (see label)	12m	10m	4m
Authority XL	18m	10m (soil pH < 6.8) 18m (soil pH > 6.8)	10m (soil pH < 6.8) 18m (soil pH > 6.8)	10m (soil pH < 6.8) 18m (soil pH > 6.8)	4m
Basagran	none	none	none	none	none
Boundary	8m	4m	12m	8m	4.5m
Canopy DF	10m (soil pH < 7.0) 18m (soil pH > 7.0)	10m (soil pH < 7.0) 18m (soil pH > 7.0)	10m (soil pH < 7.0) 18m (soil pH > 7.0)	10m (soil pH < 7.0) 18m (soil pH > 7.0)	4m
Canopy EX	8m/10m (see label)	7m	9m/10m (see label)	9m/10m (see label)	3m/4m (see label)
Classic	8m	7m	9m	9m	3m
Cobra	none	none	none	none	none
Command 3ME	9m	9m	9m	9m	12m
Envive	10m (soil pH < 7.0) 18m (soil pH > 7.0)	10m	10m	9m (see label)	4m
Enlite	9m	9m	9m	15m/6m (see label)	4m
Fierce	4m	30d (see label)	18m	18m	4m
FirstRate	9m	9m	9m	9m	4m
Flexstar GT 3.5	none	10m	10m	10m	4m
FrontRow	9m	9m	9m	see label	4.5m
Fusilade DX	none	2m	2m	2m	2m
Marvel	none	10m	10m	10m	4m
metribuzin	8m	4m	12m	8m	4m
Prowl 3.3 EC/Prowl H ₂ O/Pendimax	none	none	none	none	none
Pursuit 2EC	18m	8.5m ¹	18m	40m ¹	4m
Python	18m	none	12m	6m	4m
Reflex/Flexstar/others	none	10m	10m	10m	4m
Scepter 70DG	18m	9.5m	11m	following spring	4m
Select Max/others	none	1m	1m	1m	1m
Sharpen	1.5m (see label)	none	none (see label)	4m	none (see label)
Synchrony XP	8m/10m (see label)	7m	9m/15m (see label)	9m/18m (see label)	3m/4m (see label)
Ultra Blazer	100d	100d	100d	100d	40d
Valor	30d (see label)	30d (see label)	30d (see label)	30d (see label)	30d (see label)
Valor XLT	10m (soil pH < 7.0) 30m (soil pH > 7.0)	10m (soil pH < 7.0) 18m (soil pH > 7.0)	10m (soil pH < 7.0) 18m (soil pH > 7.0)	9m (soil pH < 7.0) 18m (soil pH > 7.0)	4m
Verdict	following year	none	none	following year	4m
Zidua	4m	none	18m	10-24m (see label)	4-6m (see label)

CALIBRATION PROCEDURES

SPRAYER CALIBRATION

Sprayer calibration is the process of determining the correct vehicle speed, tip and pressure to create a desired application rate (usually in gallons per acre or GPA) and most manufacturers have tables to help you determine these values for their equipment and tips. Still, differences can occur between your spray vehicle and the manufacturer's rates because of tip wear, inaccurate pressure gages and flow meters, varying liquid viscosities (created by multiple chemical mixtures and additives) and hose losses. To properly calibrate a sprayer, you should select the correct tip size, pressure, speed and type to obtain the desired GPA rate, and then use sprayer calibration to make sure that your sprayer is applying this rate. Note that most farmers can quickly determine correct flow rate in the field from liquid usage in the tank, but this type of monitoring does not indicate plugged or non-uniformity nozzle flow or flow inconsistencies in the boom sections. When selecting a nozzle tip, keep in mind that slower speeds (5-12 MPH) typically require less power and pressures to achieve that flowrate and have a larger pressure envelope in which to operate (i.e., the spray controller has a larger pressure range in which to operate), so tip selection should be designed for middle of the spray range. After selection, sprayer calibration can be achieved using the following steps:

- 1) Measuring the flow rate of individual tips: Measuring the flow rate from individual tips can help determine when tips need to be changed and the actual flowrate. Individual nozzle tests are performed by either using a calibration container (Teejet, etc.) or a Spot-on calibrator (<http://www.innoquestinc.com/>). Spot-on calibrators can greatly reduce your time in performing this operation and make the test less labor and time intensive and more practical on booms with multiple nozzle tips. To check nozzles, place the calibrator under the tip of the nozzle for the set time period and read the amount of the gallons per minute (GPM) for that nozzle (note: to perform this operation successfully, you may have to reprogram the flow controller (or bypass) to operate while the machine is not moving for the rated pressure you will use in the field. Always perform a visual spot check to insure that all nozzles are operating and that filters are not clogged (filters and anti-drip caps should be removed and flushed with water to remove chemicals and debris). The GPM of each nozzle should be within 10% of target GPM. If any tip varies by more than 10%, a new tip may be necessary. If the average GPM of all nozzles is above or below the target rate, slight adjustments in the pressure, speed or even recalibration of the flowrate sensor may be necessary (check manufacturer's manual on how to clean and re-calibrate the flow sensor). Flow rate test should be performed on nozzles at least once a year. The general equation for calculating individual nozzle flow rate is given by:

$$GPM = \frac{GPA * MPH * W}{5940}$$

where: GPM is the gallons per minute of liquid used per application width
 GPA is the gallons per acre
 MPH is the average speed of the vehicle through the field
 W is the nozzle application width in inches (typically the distance between the nozzles for broadcast sprayers or banding width for banding sprayers)

This equation can also be rearranged to indicate application rate (GPA) for the entire boom width by adding all the individual GPM nozzles together and using the entire boom width in inches.

CALIBRATION PROCEDURES

- 2) Insure that the sprayer speed is correct: Speeds must be correctly reported to the rate controller (or operator) to obtain the correct GPA rates, and this value should be held as consistent as possible when travelling through the field. Typically on new sprayers, speed is inputted with GPS directly into the flowrate controller and no calibrations are required. Older machines that use radar (and some GPS unit that output radar type readings) are based on pulsed frequencies, and this value must be calibrated in the rate controller to indicate the correct speed. Typically, this procedure is performed by travelling a prescribed distance with the controller set in a speed calibration mode. Consult the manufacturer's manual for this procedure and the travel distance needed for calibration. Calibration of speed sensors should be performed once a year. In some cases, the radar unit may slip down in its mounting creating the wrong angle between the radar's emitter unit and the ground (typically this angle is 30-45 degrees) which can cause sluggish, noisy or nonexistent return signals. In this case, check that the radar unit is securely affixed to the vehicle frame and that the correct angle is created between the unit and ground. Consult the manufacturer's manual for the correct orientation because some radar units contain angled emitters that allow the unit to be mounted horizontal while still allowing for the correct angle for radar readings. Wheel speed sensors should not be used for general row crop purposes, but may be acceptable in pasture and other situations where terrain conditions are more consistent. To check the travelling distance versus speed for these types of systems, use the equation given below with at least a 500 feet or larger travel distance (to insure 0.5 MPH speed accuracy).

$$MPH = \frac{360 * \text{Distance Travelled in Feet}}{528 * \text{Time Needed to Travel that Distance in Seconds}}$$

*Use distances of at least 500 feet or more for 0.5 MPH or better accuracy in the 5-20 MPH speed range.

CONVERSION FACTORS

Weights	Temperature
1 U. S. ton = 2,000 lb. = 0.97 metric ton 1 lb. = 16 oz. = 453.6 grams = 0.4356 kilograms 1 oz. = 20.35 grams	$^{\circ}\text{C} = 5/9 (^{\circ}\text{F} - 32)$ $^{\circ}\text{F} = (9/5 ^{\circ}\text{C}) + 32$ $^{\circ}\text{K} = ^{\circ}\text{C} + 273.16$ $^{\circ}\text{R} = ^{\circ}\text{F} - 459.69$

Speed	Length
1 mph = 5,280 ft./hr. = 88 ft./minute = 1.467 ft./sec 1 m/sec = 196.85 ft./minute = 2.24 mph 1 m/sec = 1.942 knots	1 mile = 5,280 ft. = 1.6093 kilometers 1 yd. = 3 ft. = 36 in. = 91.44 cm. 1 ft. = 12 in. = 30.48 cm.

Area	
1 sq. mile = 640 acres 1 acre = 43,560 sq. ft. 1 acre = 0.405 hectare 1 hectare = 2.47 acres 1 hectare = 10,000 m sq. 1 yd. sq. = 9 ft sq. = 0.836 m sq. 1 ft. sq. = 144 in. sq. = 0.09 m sq. 1 cm. sq. = 0.155 in. sq. # Acres = [Length (ft.) x width (ft.)]/43,560	1 acre = 13,068 ft. of 40-in. rows = 13,756 ft. of 36-in. rows = 14,520 ft. of 36-in. rows = 16,335 ft. of 32-in. rows = 17,424 ft. of 30-in. rows

Liquid Measure	
1 tbsp. = 3 tsp. (0.5 oz.) 1 oz. = 2 tbsp. 1 cup (1/2 pint) = 16 tbsp. (8 oz.) 1 pint (2 cups) = 32 tbsp. (16 oz. or 1 lb.) (473 ml.) 1 gal. = 231 in. cubed = 4 q.t = 8 pt. = 16 cups = 8.4 lb. water 1 gal. = 128 fl oz = 3.785 l = 3,785 ml. = 3,785 cm. cubed	1 qt. = 2 pt. = 4 cups = 32 oz. = 0.946 l = 946 ml. 1 pt. = 2 cups = 16 oz. = 0.473 l = 473 ml. 1 cup = 8 oz. = 0.24 l = 240 ml. 1 fl. oz. = 8 oz. = 0.24 l = 240 ml. 1 tbsp. = 3 tsp = 0.5 oz. = 14.78 ml. 1 tsp. = 0.166 oz. = 4.92 ml. 1 ml. = 0.0338 fl oz.

NOZZLE TYPE AND DRIFT REDUCTION

Preferred nozzles for drift reduction are AI (air induction), DR and DG (drift reduction and drift guard) and hollow cones (when used at the bottom of their pressure ranges). These nozzles limit and/or reduce the number of droplet fines below 150 μm (micromole) that have the greatest tendency to travel large distances (> 3,000 ft.). A.I. flat fans and A.I. Turbo Tees are recommended for most contact herbicides applications and produce a coarse- to ultra-coarse droplets, which are safe for spraying in most conditions. Other advantages of these nozzles are that over-pressurization from mechanical failure or improper adjustment will only produce a coarse droplet, creating a very “safe” spraying environment. While spraying fungicides or insecticides, a finer droplet size may be needed; either a DR/DG Flat Fan or hollow cone will work well for this purpose (some hollow cones have been proven to contain zero to very few driftable fines in the spray pattern at low pressure ranges). It is recommended that you closely monitor time of application and environmental conditions because wind, temperature and humidity can greatly affect evaporation effects and where droplets will land. Consult the manufacturer’s label for specific details on tip selection for a particular chemical. All tips are rated with a color code to indicate the droplet spectrum they produced and arranged from alert colors (red, yellow, etc.) for the smallest droplet sizes (50 to 100 μm) to coarsest droplets (black, blue, etc., - 400 to 600 μm). Most drift reduction nozzles (A.I., DR and DG) have preorifice chambers (or other drift reduction techniques) that reduce driftable fines (< 150 μm) over conventional nozzles. Note that the color chart does not always indicate the amount of driftable fines for any particular nozzle and some fine may always be present in the spray. Problems most often occur when an incorrect pressure is used with the wrong tip for a certain application to achieve a desired flow rate (GPA). On multiple-use trucks, outfit booms with multiple-tip nozzle bodies and have a good working knowledge of what each tip is used for and corresponding pressure ranges. Do not mix A.I. tips from different manufacturers because the size of the air inlet and internal geometry greatly influences the flow rate and one manufacturer’s tip may not output the same flow rate as another’s at the same pressure. The following table is given as a guideline for tip selection:

Pesticide and Mode of Action	Tip or Nozzle Selection	Recommended Practices
Most Herbicides with Systemic Type Attributes – Coarse Droplets	A.I. Flat Fans and A.I. Turbo Tees (Air Induction)	<ul style="list-style-type: none"> - Use higher flow rates to insure good coverage (although higher flow rates are not always necessary to attain good results). <ul style="list-style-type: none"> o Spray when environmental conditions are optimum. o Make sure a low level inversion layer is not present (fog, heavy air, etc.) o Make sure winds are between 2 and 10 MPH (some winds are needed to insure a stable, non-inversion layer environment). - Monitor back of sprayer and droplet evaporation. <ul style="list-style-type: none"> o If you see a large amount misting behind sprayer, check system for over-pressurization or wrong tip selection and flow rate. - Keep boom height at recommended distance from canopy (typically 18-20 inches from canopy surface). - Use hooded sprayers to further aid in drift reduction. <ul style="list-style-type: none"> o Make sure to run hood on the surface of the crop canopy.
Herbicides and Pesticides with Contact and/or Partially Systemic Attributes – Medium Droplet Size	DR and DG (Drift Reduction and Drift Guard)	
Fungicides – Medium Droplet Size Insecticides – Fine Droplet Size	Fungicide and Insecticides – DR/DG (Drift Reduction/Guard) and Hollow Cones or Equivalent	

GLOSSARY OF HERBICIDES

HERBICIDE TRADE NAME, COMMON NAME, FORMULATION AND MANUFACTURER¹			
Trade Name	Common Name	Formulation	Manufacturer
2,4-D amine or ester	2,4-D	several	several
2,4-DB	2,4-DB	several	several
Aatrex and others	atrazine	4L, 90 DF	several
Accent Q	nicosulfuron	54.5 WDG	DuPont
Acclaim	fenoxaprop	1 EC	Bayer
Acclaim Extra	fenoxaprop	0.57 E	Bayer
Aim	carfentrazone	40 DG; 2 EC; 1.9 EW	FMC
Alanap	naptalam	2 L	Crompton Uniroyal
Ally XP	metsulfuron	60 DF	DuPont
Anthem	pyroxasulfone + fluthiacet-methyl	2.15 SE (2.087 + 0.063 lb/gal)	FMC
Anthem ATZ	pyroxasulfone + fluthiacet-methyl + atrazine	4.505 SE (0.485 + 0.014 + 4.006 lb/gal)	FMC
Anthem Flex	pyroxasulfone + carfentrazone	4 SE (3.733 + 0.267 lb/gal)	FMC
Armezon	topramezone	2.8 L	BASF
Arsenal A.C.	imazapyr	4 AC	BASF
Assure II	quizalofop	0.88 EC	DuPont
Asulox	asulam	3.3 EC	UPI
Authority	sulfentrazone	75 DF	FMC
Authority Elite/BroadAxe	sulfentrazone + S-metolachlor	7.0 SL (0.7 + 6.3 lb/gal)	FMC/Syngenta
Authority First/Sonic	sulfentrazone + choransulam	0.7 DF (0.62 + 0.08 lb/gal)	FMC/Dow AgroSciences
Authority MTZ	sulfentrazone + metribuzin	45 DG (18 + 27%)	FMC
Authority XL	sulfentrazone + chlorimuron	70 DG (62.22 + 7.78%)	FMC
Avast! SC	fluridone	4 SC	SePro
Axial XL	penoxaden	0.83 EC	Syngenta
Balan	benefin	60 DF; 2.5G	Dow AgroSciences
Balance Flexx	isoxaflutole	2.05 L	Bayer
Banvel	dicamba	4 SL	Microflo
Barrage HF	2,4-D ester	4.7 EC	Helena
Barricade	prodiamine	65 WG	Syngenta
Basagran	bentazon	5 SL	AgriSolutions

GLOSSARY OF HERBICIDES

HERBICIDE TRADE NAME, COMMON NAME, FORMULATION AND MANUFACTURER ¹			
Trade Name	Common Name	Formulation	Manufacturer
Basagran T/O	bentazon	4 L	AgriSolutions
Basamid G	dazomet	99 G	Certis USA
Betasan; Bensumec	bensulide	4 E	PBI Gordon
Beyond	imazamox	1 S	BASF
Bicep II Magnum	S-metolachlor + atrazine	5.5 L (3.1 + 2.4 lb/gal)	Syngenta
Bolero	thiobencarb	8 EC	Valent
Boundary	S-metolachlor + metribuzin	6.5 EC (5.25 + 1.25 lb/gal)	Syngenta
Broadhead	carfentrazone + quinclorac	7 L (0.027 + 0.46 lb/gal)	FMC
Broadstar	flumioxazin	0.25 G	Valent
Buctril	bromoxynil	4 EC; 2 EC	Bayer
Butoxone 200	2,4-DB	2 SL	Cedar Chemical
Butyrac 200	2,4-DB	2 SL	Albaugh
Cadet	fluthiacet methyl	0.91 EC	FMC
Cadre	imazapic	2 AS	BASF
Callisto	mesotrione	4 L	Syngenta
Canopy DF	metribuzin + chlorimuron	75 DF (64.3 + 10.7%)	DuPont
Canopy EX	chlorimuron + tribenuron	29.5% WDG (22.7% + 6.8%)	DuPont
Caparol	prometryn	80 DF; 4 L	Syngenta
Capreno	thiencarbazone-methyl + tembotrione	3.45 L (0.57 + 2.88 lb/gal)	Bayer
Casoron	dichlobenil	2 G; 4 G	Crompton
Celsius	iodosulfuron + thiencarbazone-methyl + dicamba	68 WG (1.9 + 8.7 + 57.4%)	Bayer
Certainty	sulfosulfuron	75 DF	Monsanto
Chaser	2,4-D + triclopyr	3 S (2 + 1 lb/gal)	Verdicon
Chateau	flumioxazin	51 SW; 51 WDG	Valent
Chopper	imazapyr	2 S	BASF
Cimarron Max	metsulfuron + 2,4-D + dicamba	60 DF and 1.87 + 1 lb/gal	Bayer
Cimarron Plus	metsulfuron + chlorsulfuron	63 DF (48 + 15%)	Bayer
Cinch	S-metolachlor	7.64 EC	DuPont
Cinch ATZ	S-metolachlor + atrazine	5.5 F (3.1 + 2.4 lb/gal)	DuPont

GLOSSARY OF HERBICIDES

HERBICIDE TRADE NAME, COMMON NAME, FORMULATION AND MANUFACTURER¹			
Trade Name	Common Name	Formulation	Manufacturer
Clarity	dicamba	4 S	BASF
Classic	chlorimuron	25 DF	DuPont
Clearcast	imazamox	1 SC	BASF
Clearpath	imazethapyr + quinclorac	75 DF	BASF
Clincher SF	cyhalofop	2.38 L	Dow AgroSciences
Clipper	flumioxazin	51% WDG	Valent
Cobra	lactofen	2 EC	Valent
Command	clomazone	3 ME	FMC
Confront	triclopyr + clopyralid	3 L (2.25 + 0.75 lb/gal)	Dow AgroSciences
Corsair	chlorsulfuron	75 WDG	Nufarm
Corvus	thiencarbazone-methyl + isoxaflutole	2.63 SC (0.75 + 1.88)	Bayer
Costarr	glyphosate + dicamba	2.1 EC (1.5 + 0.6 lb/gal)	Albaugh
Cotoran	fluometuron	4 L; 80 DF	MANA
Cotton-Pro	prometryn	4 L	DuPont
Crossbow	2,4-D + triclopyr	3 S (2 + 1 lb/gal)	Dow AgroSciences
Curbit	ethafluralin	3 EC	Platte Chemical
Dacthal; DCPA	DCPA	75 WP; 6 L; 5 G	Amvac Chemical
Degree	acetochlor	3.8 SL	Monsanto
Delta Goal	oxyfluorfen	4 EC	Dow AgroSciences
Devrinol	napropamide	2 G; 2 EC	United Phosphorus
Dimension	dithiopyr	2 EC; 1 EC	Dow AgroSciences
Direx	diuron	4 L	MANA
Dismiss	sulfentrazone	4L	FMC
Drive	quinclorac	75 DF	BASF
DSMA Plus	DSMA	3.8 SL	UAP-Loveland
Dual II Magnum	S-metolachlor	7.64 EC	Syngenta
Dual Magnum	S-metolachlor	7.62 EC	Syngenta
Duet	propanil + bensulfuron	60 DF (60 + 0.46%)	RiceCo
Dupont K-4	diuron + hexazinone	60 DG (46.8 + 13.2%)	Bayer

GLOSSARY OF HERBICIDES

HERBICIDE TRADE NAME, COMMON NAME, FORMULATION AND MANUFACTURER¹			
Trade Name	Common Name	Formulation	Manufacturer
Dyclomec	dichlobenil	4 G	PBI Gordon
Echelon	sulfentrazone + prodiamine	4 SC (13.6 + 27.3%)	FMC
Endurance	prodiamine	65 WDG	Syngenta
Enlite	chlorimuron + flumioxazin + thifensulfuron	47.9 WDG (2.85 + 36.21 + 8.8%)	DuPont
Envive	chlorimuron + flumioxazin + thifensulfuron	41.3 WDG (9.2% + 29.2% + 0.9%)	DuPont
Envoke	trifloxysulfuron	75 DG	Syngenta
Envoy	clethodim	0.94 EC	Valent
Eptam	EPTC	7 EC	Syngenta
Escort	metsulfuron	60 DF	Bayer
ET	pyraflufen ethyl	0.208 EC	Nichino
Exceed	primisulfuron + prosulfuron	57 DF (28.5 + 28.5%)	Syngenta
Express	tribenuron	75 DF	DuPont
Facet	quinclorac	75 DF	BASF
Factor	prodiamine	65 WSG	Syngenta
Fierce	flumioxazin + pyroxasulfone	76 WDG (33.5 + 42.5%)	Valent
Finale	glufosinate	1 SL	Bayer
Finesse	chlorsulfuron + metsulfuron	75 DF (62.5 + 12.5%)	DuPont
FirstRate	cloransulam	84 DF	Dow AgroSciences
FirstShot SG	thifensulfuron + tribenuron	50% SG (25% + 25%)	DuPont
Flexstar GT 3.5	fomesafen + glyphosate	2.82 L (0.56 + 2.66 lb/gal)	Syngenta
Flexstar, Rhythm	fomesafen	1.88 ME	Syngenta; Cheminova
Forestry Garlon 4	triclopyr	4 SL	Dow AgroSciences
FreeHand	dimethenamid-P + pendimethalin	1.75 G (0.375 + 0.5 lb/gal)	BASF
Frontrow	cloransulam + flumetsulam	co-pack 84% + 80%	Dow AgroSciences
Fusilade DX	fluazifop	2 EC	Syngenta
Fusion	fluazifop + fenoxaprop	2.56 EC (2 + 0.56 lb/gal)	Syngenta
Galigan	oxyfluorfen	2 E	MANA
Galleon	penoxsulam	2 SC	SePRO
Gallery	isoxaben	75 DF	Dow AgroSciences

GLOSSARY OF HERBICIDES

HERBICIDE TRADE NAME, COMMON NAME, FORMULATION AND MANUFACTURER¹			
Trade Name	Common Name	Formulation	Manufacturer
Garlon	triclopyr	4 L	Dow AgroSciences
Glory; Metribuzin 75 DF	metribuzin	75 DG	various
glyphosate formulations ²	glyphosate	various	various
Goal 2XL; Goal T/O	oxyfluorfen	2 EC; 1.6 EC	Dow AgroSciences
Goosegrass/Crabgrass Control	oxadiazon + bensulide	6.56 G (1.31 + 5.25%)	Scotts
Gramoxone, Parazone, Quik-Quat	paraquat	2 SL	Syngenta; Drexel; MANA
Grandstand R	triclopyr	3 SL	Dow AgroSciences
Grasp	penoxsulam	2 EC	Dow AgroSciences
Grasp Xtra	penoxasulam + triclopyr	2.31 EC (0.25 + 2.06 lb/gal)	Dow AgroSciences
Grazon P + D	picloram + 2,4-D	2.54 L (0.54 + 2 lb/gal)	Dow AgroSciences
GrazonNext	aminopyralid + 2,4-D	3 lb/gal (0.33 + 2.67 lb/gal)	Dow AgroSciences
Habitat	imazapyr	2.0 lb/gal	BASF
Halex GT	mesotrione + S-metolachlor + glyphosate	4.4 L (0.209 + 2.09 + 2.09)	Syngenta
Halo Max 75	halosulfuron	75 WG	Aceto
Harmony Extra	thifensulfuron + tribenuron	75 DF (50 + 25%)	DuPont
Harness Extra	acetochlor + atrazine	5.6 L (3.1 + 2.5 lb/gal); 6 L (4.3 + 1.7 lb/gal)	Monsanto
Harness, Warrant	acetochlor	7 EC	Monsanto
Hoelon	diclofop	3 EC	Bayer
Hyvar X	bromacil	80 WP	Bayer
Ignite	glufosinate	2.38 SL	Bayer
Illoxan	diclofop	3 EC	Bayer
Image	imazaquin	1.5 EC; 70 DG	BASF
Impact	topramezone	2.8 L	AMVAC
Instigate	rimsulfuron + mesotrione	45.84 DG (4.17 + 41.67%)	Dupont
Integrity	saflufenacil + dimethenamid	5.5 L	BASF
Intrro	alachlor	4.51 EC	Monsanto
Journey	glyphosate + imazapic	1.5 + 0.75 SL	BASF
Karmex	diuron	4 L; 80 DF	MANA

GLOSSARY OF HERBICIDES

HERBICIDE TRADE NAME, COMMON NAME, FORMULATION AND MANUFACTURER¹			
Trade Name	Common Name	Formulation	Manufacturer
Katana	flazasulfuron	25 DF	PBI Gordon
Kerb	pronamide	50 W	Dow AgroSciences
Keystone NXT	acetochlor + atrazine	5.6 L (3.1 + 2.5 lb/gal)	Dow AgroSciences
Krenite S	fosamine	4 S	Bayer
Krovar	bromacil + diuron	80 DF (40 + 40%)	Bayer
Lasso	alachlor	4 F	Monsanto
Laudis	tembotrione	3.5 L	Bayer
LeadOff	rimsulfuron + thifensulfuron	33.4 WG (16.7 + 16.7%)	DuPont
League	imazosulfuron	75 WG	Valent
Lesco PRE-M	pendimethalin	50 WP (others)	Lesco
Lescosan	bensulide	4 L (others)	Lesco
Lexar EZ	atrazine + S-metolachlor + mesotrione	3.67 L (1.74 + 1.74 + 0.224 lb/gal)	Syngenta
Liberty 280	glufosinate	2.34 SL	Bayer
Linex/Lorox	linuron	4 L	NovaSource
Londax	bensulfuron	60 DF	DuPont
Lontrel	clopyralid	3 L	Dow AgroSciences
Manor, Blade, Mansion, MSM	metsulfuron	60 WDG	Nufarm; Riverdale
Marksman	dicamba + atrazine	3.2 L (1.1 + 2.1 lb/gal)	BASF
Matrix	rimsulfuron	25 DF	DuPont
MCP amine	MCPA	4 SL	Loveland; Platte
MCPP	MCP	4 L	Verdicon
Mecomec	mecoprop	2.5 L	PBI Gordon
Micro-Tech	alachlor	4 ME	Monsanto
Milestone	aminopyralid	2 lb/gal	Dow AgroSciences
Monument	trifloxysulfuron	75 WG	Syngenta
MSMA (others)	MSMA	6 SL; 6.6 SL	several
Newpath	imazethapyr	2 AS	BASF
Obey	clomazone + quinclorac	2.5 L (1.25 + 1.25 lb/gal)	FMC
OH II	oxyfluorfen + pendimethalin	3 G (2% + 1%)	Scotts

GLOSSARY OF HERBICIDES

HERBICIDE TRADE NAME, COMMON NAME, FORMULATION AND MANUFACTURER¹			
Trade Name	Common Name	Formulation	Manufacturer
Osprey	mesosulfuron	4.5 DF	Bayer
Oust	sulfometuron	75 WDG	Bayer
Outlook	dimethenamid-p	6 EC	BASF
Outrider	sulfosulfuron	75 WP	Monsanto
Overdrive	dicamba + diflufenzopyr	0.7 L (0.5 + 0.2 lb/gal)	BASF
Paramount	quinclorac	75 DF	BASF
Parrlay	metolachlor	8 EC	Monsanto
Partner	alachlor	4 ME	Monsanto
Pastora	nicosulfuron + metsulfuron-methyl	71.2 DF (56.2 + 15%)	Bayer
PastureGard	triclopyr + fluroxypyr	1.5 + 0.5	Dow AgroSciences
Peak	prosulfuron	57 DG	Syngenta
Pendimax	pendimethalin	3.3 EC	Dow AgroSciences
Pendulum	pendimethalin	3.3 EC; 2 G; 60 WDG	BASF
Pendulum AquaCap	pendimethalin	3.8 lb/gal	BASF
Pennant Magnum	S-metolachlor	7.62 EC	Syngenta
Permit	halosulfuron	75 DG	Gowan
Phytar 560	cacodylic acid	2.48 EC	Drexel
Plateau	imazapic	70 DG	BASF
Poast	sethoxydim	1.5 EC	Microflo
Poast Plus	sethoxydim	1 EC	Microflo
Power Zone	carfentrazone + MCPA + mecoprop + dicamba	2.9 EC (0.04 + 2.21 + 0.44 + 0.22 lb/gal)	PBI Gordon
Powerflex HL	pyroxsulam	0.13 WG	Dow AgroSciences
Pramitol	prometon	25 E (25% active liquid)	Agrilience
Predict	norflurazon	80 DF	Syngenta
Prefar	bensulide	4 E	Gowan
Prefix	S-metolachlor + fomesafen	Co-Pak (7.62 EC/2 LC)	Syngenta
Pre-san	bensulide	7 G	PBI Gordon
Princep; Simazine; Caliper	simazine	4 L; 90 DG	Syngenta
Prograss	ethofumesate	1.5 EC	Bayer

GLOSSARY OF HERBICIDES

HERBICIDE TRADE NAME, COMMON NAME, FORMULATION AND MANUFACTURER¹			
Trade Name	Common Name	Formulation	Manufacturer
Prompt	bentazon + atrazine	5 L (2.5 + 2.5 lb/gal)	Microflo
Pronone	hexazinone	10 G; 2.5 G	Proserve
Prowl	pendimethalin	3.3 EC	BASF
Prowl H ₂ O	pendimethalin	3.8 CS	BASF
Pursuit	imazethapyr	2 AS; 70 DG	BASF
Pyramin	pyrazon	65 DF	Microflo
Python	flumetsulam	80 WDG	Dow AgroSciences
Q4 Plus	quinclorac + sulfentrazone + dicamba + 2,4-D	22.4 L (8.43 + 0.69 + 11.81 + 1.49%)	PBI Gordon
Quicksilver	carfentrazone	1.9 L	FMC
Rage D-Tech	carfentrazone + 2,4-D LVE	67 EC (1.44 + 65.52%)	FMC
Rage G	carfentrazone + glyphosate	5.04 SL (0.04 + 5 lb/gal)	FMC
Raptor	imazamox	1 AS	BASF
Realm Q	rimsulfuron + mesotrione	38.75 DG (7.5 + 31.25%)	Dupont
RebelEX	penoxulam + cyhalofop	2.03 L (0.25 + 1.78)	Dow AgroSciences
Reflex, Dawn	fomesafen	2 LC	Syngenta; Cheminova
Regalkade	prodiamine	65 WG	Regal
Regiment	bispyribac	80 DF	Valent
Remedy	triclopyr	4 SL	Dow AgroSciences
Renovate	triclopyr	3.0 lb/gal	SePro
Resolve Q	rimsulfuron + thifensulfuron	22.4 DF (18.4 + 4%)	DuPont
Resource	flumiclorac	0.86 EC	Valent
Revolver	foramsulfuron	0.19 L	Bayer
Reward	diquat	2 SL	Syngenta
RiceBeaux	propanil + thiobencarb	6 SL (35% + 31%)	RiceCo
Ricestar HT	fenoxaprop	0.58 EW	Bayer
Ronstar	oxadiazon	50 SP; 2 G	Bayer
Roundup formulations	glyphosate	various	Monsanto
Rout	oxyfluorfen + oryzalin	2 G (2% + 1%)	Scotts
Rubigan	fenarimol	50 WSP	Gowan

GLOSSARY OF HERBICIDES

HERBICIDE TRADE NAME, COMMON NAME, FORMULATION AND MANUFACTURER¹			
Trade Name	Common Name	Formulation	Manufacturer
Sahara DG	imazapyr + diuron	70 DG (7.78 + 62.22%)	BASF
Sandea	halosulfuron	75 DF	Gowan
Sedgehammer	halosulfuron	75 DF	Gowan
Segment	sethoxydim	1 EC	BASF
Select and others	clethodim	2 EC	various
Select Max	clethodim	0.97 EC	Valent
Sempra	halosulfuron	75 DF	Nufarm
Sencor and others	metribuzin	4 L; 75 DF	various
Sequence	glyphosate + S-metolachlor	5.25 F (2.25 + 3 lb/gal)	Syngenta
Shapshot	trifluralin + isoxaben	2.5 TG (2% + 0.5%)	Dow AgroSciences
Sharpen	saflufenacil	2.85 SC	BASF
Showcase	isoxaben + oxyfluorfen + trifluralin	1.25 G (0.25 + 0.25 + 2%)	Dow AgroSciences
Sinbar	terbacil	80 WP	DuPont
Solicam	norflurazon	78.6 DF	Syngenta
Sonalan HFP	ethalfluralin	3 EC	Dow AgroSciences
Sonar A.S.	fluridone	4 L	SePro
Spartan	sulfentrazone	4 F; 75 DF	FMC
Specticle	indaziflam	20 WSP	Bayer
Speed Zone South	carfentrazone + mecoprop + 2,4-D + dicamba	2.2 EC (0.05 + 1.53 + 0.48 + 0.14 lb/gal)	PBI Gordon
Spike	tebuthiuron	80 DF; 20 P	Dow AgroSciences
Stam M4	propanil	4 L; 80 DF	Dow AgroSciences
Staple LX	pyrithiobac	3.2 SL	DuPont
Status	dicamba + diflufenzopyr	61.1 WG (44 + 17.1%)	BASF
Steadfast Q	nicosulfuron + rimsulfuron	37.7 WDG (25.2 + 12.1)	DuPont
Stinger	clopyralid	3 SL	Dow AgroSciences
Stingray	carfentrazone	1.9 L	SePro
Storm	bentazon + acifluorfen	4 SL (2.67 + 1.33 lb/gal)	UPI
Strada	orthosulfamuron	50 WG	Isagro-USA
Strada Pro	orthosulfamuron + halosulfuron	54 WG (42.05 + 11.92%)	Isagro-USA

GLOSSARY OF HERBICIDES

HERBICIDE TRADE NAME, COMMON NAME, FORMULATION AND MANUFACTURER¹			
Trade Name	Common Name	Formulation	Manufacturer
Strada XT	orthosulfamuron + quinclorac	70 WG (10 + 60%)	Isagro-USA
Strategy	ethalfuralin + clomazone	2.1 L (1.6 + 0.5 lb/gal)	Loveland
Strongarm	diclosulam	0.84 L	Dow AgroSciences
Super Wham	propanil	4 EC	RiceCo
Suprend	prometryn + trifloxysulfuron	80 WG (79.3 + 0.7%)	Syngenta
Sureguard	flumioxazin	51 WG	Valent
Surflan	oryzalin	4 EC; 4 AS	Dow AgroSciences
Surge	2,4-D + MCPP + dicamba + sulfentrazone	0.06 + 1.4 + 0.5 + 0.22	PBI Gordon
Surmount	picloram + fluroxypyr	1.19 + 0.96	Dow AgroSciences
Surpass	alachlor	6.4 EC	Dow AgroSciences
Synchrony XP	chlorimuron + thifensulfuron	28.4 XP (21.5 + 6.9%)	DuPont
Telar	chlorsulfuron	75 DF	Bayer
Tordon 22K	picloram	2 SL	Dow AgroSciences
Tordon K	picloram	2 SL	Dow AgroSciences
Touchdown HiTech	glyphosate	4.5 SL (acid eq.)	Syngenta
Touchdown Total	glyphosate	4.17 SL (acid eq.)	Syngenta
Tower	dimethamid-P	6 EC	BASF
Tradewind	bispyribac	80 SP	Valent
Transline	clopyralid	3 L	Dow AgroSciences
TranXit GTA	rimsulfuron	25 DF	DuPont
Treflan	trifluralin	10 G	Dow AgroSciences
Treflan HFP	trifluralin	4 EC	Dow AgroSciences
Tribute Total	thiencarbazone-methyl + foramsulfuron + halosulfuron	60.5 WDG (9.9 + 19.8 + 30.8%)	Bayer
Trimec Classic	2,4-D + MCPP + dicamba	2.7 EC (1.98 + 0.53 + 0.21 lb/gal)	PBI Gordon
Trimec Southern	2,4-D + MCPP + dicamba	3 EC (1.44 + 1.32 + 0.3 lb/gal)	PBI Gordon
Tupersan	siduron	50 WP	PBI Gordon; Gowan
Turflon Ester	triclopyr	4 L	Dow AgroSciences
Ultra Blazer	acifluorfen	2 SL	UPI
Valor	flumioxazin	51 WDG	Valent

GLOSSARY OF HERBICIDES

HERBICIDE TRADE NAME, COMMON NAME, FORMULATION AND MANUFACTURER¹			
Trade Name	Common Name	Formulation	Manufacturer
Valor XLT	flumioxazin + chlorimuron	40.3 WDG (30% + 10.3%)	Valent
Vanquish	dicamba	4 SL	Syngenta
Vantage	sethoxydim	1 EC	BASF; Microflo
Velpar	hexazinone	75 DF; 2 L	DuPont/Bayer
Verdict	saflufenacil + dimethamid-P	5.57 EC (0.57 + 5 lb/gal)	BASF
Vista	fluroxypyr	1.5 EC	Dow AgroSciences
Weedmaster	dicamba + 2,4-D	3.87 SL (1 + 2.87 lb/gal)	BASF
XL	benefin + oryzalin	2 G (1 + 1%)	Setre
Yukon	halosulfuron + dicamba	67.5 WSG (12.5 + 55%)	Gowan
Zidua	pyroxasulfone	85 WG	BASF

¹ Liquid formulations include AC, applicator's concentration; CS, aqueous capsule suspension; E, EC or EW, emulsifiable concentration; F, flowable; L, liquid, ME, micro-encapsulated; SL, soluble liquid; S, suspension. Dry formulations include DF, dry flowable, DG, dispersible granules; G, granules, SE, suspoemulsion; SP, soluble powder, W, WG, and WDG, wettable dispersible granules, WP, wettable powder, WSG, wettable soluble granule.

² For list of glyphosate products, please see Appendix A "Glyphosate Products, Formulations, and Surfactant Suggestions."

GLYPHOSATE PRODUCTS

Appendix A: GLYPHOSATE PRODUCTS, FORMULATIONS AND SURFACTANT SUGGESTIONS^{1,2}							
Product	Manufacturer or Distributor	AI Concentration³		Surfactant Needed³	Rate Equivalent (4 lb ai/gal Product)		
		Acid (a.e.)	Salt (a.i.)		1.0 pt.	1.5 pt.	2.0 pt.
Abundit Extra	Nufarm	3	4	No	1.0	1.5	2.0
Accord XRT II	Dow AgroSciences	4	5.07	No	0.7	1.1	1.5
Aqua Star	Albaugh (Agri-Star)	4	5.4	Yes	0.7	1.1	1.5
Aquamaster	Monsanto	4	5.4	Yes	0.7	1.1	1.5
Buccaneer	Tenkoz	3	4	Yes	1.0	1.5	2.0
Buccaneer Plus	Tenkoz	3	4	Yes	1.0	1.5	2.0
Cornerstone Plus	Agriliance	3	4	No	1.0	1.5	2.0
Credit 4I	Nufarm	3	4	Yes	1.0	1.5	2.0
Credit 4I Extra	Nufarm	3	4	No	1.0	1.5	2.0
Credit Extra	Nufarm	3	--	No	1.0	1.5	2.0
Credit Xtreme	Nufarm	4.5	5.8	No	0.7	1.1	1.5
Departure	Syngenta	4.17	--	Yes	0.75	1.1	1.44
Duramax	Dow AgroSciences	4	5.07	No	0.7	1.1	1.5
Durango DMA	Dow AgroSciences	4	5.4	No	0.7	1.1	1.5
Envy	Innvictis Crop Care	3	4	No	1.0	1.5	2.0
Envy Intense	Innvictis Crop Care	3	4	No	1.0	1.5	2.0
Gly Star Pro	Albaugh	3	4	Yes	1.0	1.5	2.0
Gly Star Gold	Albaugh	3	4	No	1.0	1.5	2.0
Gly Star K-Plus	Albaugh	4.5	5.5	No	0.7	1.1	1.5
Glyfine Plus	Aceto	3	4	No	1.0	1.5	2.0
Glyfos X-tra	Cheminova	3	4	No	1.0	1.5	2.0
Glyfos	Cheminova	3	4	Yes	1.0	1.5	2.0
Glyfos Aquatic	Cheminova	4	5.4	Yes	0.7	1.1	1.5
Glyphosate 5.4	Alligare	4	5.4	Yes	0.7	1.1	1.5
Glyphosate Plus	Quali-Pro	3	4	No	1.0	1.5	2.0
Glyphogen	MANA	3	4	Yes	1.0	1.5	2.0
Glyphogen Plus	MANA	3	4	No	1.0	1.5	2.0
Honcho	Monsanto	3	4	Yes	1.0	1.5	2.0

GLYPHOSATE PRODUCTS

Appendix A: GLYPHOSATE PRODUCTS, FORMULATIONS AND SURFACTANT SUGGESTIONS ^{1,2}							
Product	Manufacturer or Distributor	AI Concentration ³		Surfactant Needed ³	Rate Equivalent (4 lb ai/gal Product)		
		Acid (a.e.)	Salt (a.i.)		1.0 pt.	1.5 pt.	2.0 pt.
Hoss Ultra	Helena	3	4	No	1.0	1.5	2.0
Imitator Aquatic	Drexel	4	5.4	Yes	0.7	1.1	1.5
Imitator DA	Drexel	3	3.7	No	1.1	1.6	2.2
Imitator Plus	Drexel	3	4	No	1.0	1.5	2.0
Mad Dog	Loveland	3	4	Yes	1.0	1.5	2.0
Mad Dog Plus	Loveland	3	4	No	1.0	1.5	2.0
Makaze	Loveland	3	4	No	1.0	1.5	2.0
Ranger Pro	Monsanto	3	4	No	1.0	1.5	2.0
Rascal Plus	Winfield Solutions	3	4	No	1.0	1.5	2.0
Razor	Nufarm	3	4	Yes	1.0	1.5	2.0
Razor Pro	Nufarm	3	4	No	1.0	1.5	2.0
Refuge	Syngenta	5	6.22	Yes	0.6	1.0	1.3
Rodeo	Dow AgroSciences	4	5.4	Yes	0.7	1.1	1.5
Roundup OriginalMax	Monsanto	4.5	5.5	No	0.7	1.1	1.5
Roundup PowerMax II	Monsanto	4.5	5.5	No	0.7	1.1	1.5
Roundup Pro	Monsanto	3	4	No	1.0	1.5	2.0
Roundup ProMax	Monsanto	4.5	5.5	No	0.7	1.1	1.5
Roundup Ultra	Monsanto	3	4	No	1.0	1.5	2.0
Touchdown HiTech	Syngenta	5	--	Yes	0.6	0.9	1.2
Touchdown Total	Syngenta	4.17	--	No	0.75	1.1	1.44

¹ Other glyphosate products exist, and some products listed may not be available in Louisiana. See label for specific crops and uses. The LSU AgCenter does not recommend or endorse specific herbicide brands.

² Like a few other herbicides, glyphosate active ingredient can be expressed as either a “salt” form or the “acid-equivalent” of the actual glyphosate. The glyphosate molecule is attached to the salt is formulated with and is the true active product. The salt itself does not contribute to weed control. Therefore, because salt formulations differ in weight, a better comparison among glyphosate products is the direct comparison of actual amount of glyphosate, i.e., the acid equivalent. Both concentrations are generally given on the label.

³ Some formulations of glyphosate contain some surfactant; however, additional surfactant is required with certain spray volumes. For other formulations, additional surfactant should not be added when the product is used alone. See label for specific surfactant rates and uses.



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**William B. Richardson, LSU Vice President for Agriculture
Louisiana State University Agricultural Center
Louisiana Agricultural Experiment Station
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