

# Soybean Weed Control

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## **Weed Identification**

Weed management is an integral part of soybean production. In order to select the most appropriate herbicide(s) or devise the optimum weed control system, one must be able to properly identify the weeds present within a field. Weed identification immediately following emergence is essential since the effectiveness of most herbicides is weed size dependent. Maps of weeds by species in fields prior to harvest will aid in the choice of preemergence herbicide program the following year. Weed seedling photographs and characteristics can be viewed at (<http://www.ppws.vt.edu/weedindex.htm>).

## **Roundup Ready Soybean**

Roundup Ready soybean has been widely adopted by South Carolina growers, with approximately 95% of the 2003 soybean acreage planted to this technology. Due to vast acceptance of RR soybean, there are a few weed management points that growers should consider when planting RR soybeans.

1. Consider using a soil-applied herbicide if you are using Roundup Ready (RR) technology and planting in wide rows (30- to 38-inch rows). Unlike many postemergence herbicides, Roundup is able to control weeds larger than those normally treated with conventional herbicides; however, don't delay applying Roundup with hopes of a single application being sufficient for season-long weed control. Research has shown that delaying a single application of Roundup in the absence of a soil-applied herbicide to 28 days after soybean emergence reduces soybean yields by 5 bu/acre. In the absence of a soil-applied herbicide, Roundup will generally need to be applied approximately 14 days after soybean emergence to prevent early-season yield loss from weed competition. Also, various weed species such as Florida pusley, dayflower, nutsedge, and morningglories are somewhat tolerant to Roundup, generally requiring multiple applications for effective control. Use of a soil-applied herbicide will reduce the need for sequential Roundup applications and provide greater flexibility in timing of Roundup.
2. If RR technology is used in a field, consider crop rotation or at least rotation of herbicide systems to reduce the potential for development of glyphosate resistance. Roundup Ready technology should be used only as a weed management tool. Continued use of Roundup in soybean and other RR rotational crops will increase the likelihood of glyphosate resistance. Assess the economic costs and benefits of using RR technology. The assessment of a technology fee on RR soybeans will increase seeding costs. The decision that farmers must make is whether herbicide costs can be off-set with a RR weed management system and the benefit of using a broad-spectrum herbicide.

## **Resistant Weed Management**

Most conventional weed control programs in soybeans involve an ALS and/or DNA soil-applied herbicide such as Python, Canopy, Scepter, Treflan, Prowl, or others followed by postemergence use of the ALS herbicides Classic or Harmony GT. Sicklepod is the number one weed in South Carolina soybeans, and ALS herbicides are one of the few modes of action that provides effective sicklepod control in conventional soybeans. The second most troublesome weed is Palmer amaranth and like sicklepod, weed control programs targeting this species also rely heavily on ALS herbicides. In addition, a DNA is commonly applied at planting to provide early-season Palmer amaranth suppression along with grass control. In many instances, these two modes of action are utilized multiple years because soybeans are often not rotated with other summer crops and some of the products are relatively inexpensive yet effective on the weed spectrum in most fields.

Palmer amaranth from many farms within the state has been confirmed resistant to ALS and/or DNA herbicides. The repeated use of these products over multiple cropping seasons, with failure to rotate summer crops and herbicide modes of action is likely the cause of resistance. A common misconception among farmers is that use of "different" products for weed management results in use of different herbicide modes of action. Many farmers may unknowingly be utilizing the same mode of action yearly. Development of resistant weed management strategies and knowledge of herbicide modes of action is essential if further development and spread of resistant weeds is to be prevented, especially weed resistance to glyphosate. Some recommendations for preventing, delaying, or managing herbicide-resistant weeds include:

1. Know the mode of action of the potential products to be applied. Note that many products are actually premixes and have multiple modes of action (see table below).
2. Rotate crops annually. Weed associations with crops vary because of differences in time of weed emergence relative to crop planting.
3. When rotating crops, also rotate herbicide modes of action.
4. Do not use the same mode of action multiple times in one cropping season.
5. Use tank mixes with different modes of action.
6. Use multiple modes of action to target the most problematic weed within a field.
7. Use cultural practices such as tillage and narrow row widths to reduce the number of annual herbicide applications.

If a farmer has or suspects a herbicide-resistant weed, it is imperative that seed production is prevented. Most weeds are prolific seed producers, with seed remaining viable for many years in the soil; hence, resistant weeds will be a problem in subsequent crops if allowed to produce seed. Weed seed can also be easily spread over an entire farm and onto neighboring farms, exacerbating weed management difficulties. Therefore, if weeds are thought to be

resistant to a herbicide, use all means available to prevent seed production and spread of the resistant weed.

With greater farmer awareness of herbicide-resistant weeds, many farmers frequently suspect Palmer amaranth resistance to glyphosate. Currently, there are no confirmed reports of glyphosate-resistant Palmer amaranth in South Carolina or in any other state. Some of the reasons for disappointment in Palmer amaranth control with glyphosate may be a result of dry conditions at application and hence, limited uptake and movement of glyphosate within the treated plants. Also, glyphosate provides no residual control of Palmer amaranth or any other weed, and since Palmer amaranth continually emerges throughout the cropping season, reinfestation is likely in the absence of a dense crop canopy at the time of application.

While there have been no confirmed weeds with resistance to glyphosate in South Carolina, the potential for glyphosate resistance is likely. Many farmers are planting Roundup Ready soybeans followed by Roundup Ready soybeans or other Roundup Ready crops in subsequent years. In 2003, approximately 95% of soybean and cotton acreage in South Carolina was Roundup Ready. Furthermore, the annual use of glyphosate as a "burndown" herbicide in addition to sequential in-crop applications is a common weed management system and is destined for selection of glyphosate-resistant weeds. In 13 states, glyphosate-resistant horseweed has been documented, with some these states being adjacent to South Carolina, such as North Carolina and Tennessee. Also a common lambsquarters biotype that has exhibit tolerance to glyphosate was recently identified in Virginia by Drs. Scott Haywood and Steve King. Therefore, the possibility for weed resistance to glyphosate in South Carolina is likely and farmers need to use herbicide-resistance management strategies to optimize prevention of weed resistance to glyphosate and other herbicides.

Due to the vast array of products currently available to farmers, knowledge concerning herbicide mode(s) of action may seem cumbersome to many farmers; however, this knowledge is essential for reducing the occurrence of and for effective management of herbicide-resistant weeds. To simplify the obtainment of herbicide mode of action information, a table of soybean products and their mode(s) of action has been compiled. These products are labeled for "burndown" and/or in-crop weed management in soybeans. This is not a Clemson University list of recommended herbicides for soybeans, but rather a list of available products to provide County Extension Agents and farmers information regarding herbicide modes of action. Herbicide labels are annually changing and new trade names are rapidly entering the market. Even though this list of trade names may seem extensive, some names may have been unintentionally overlooked when compiling this information.

### **Optimizing Weed Control with Glyphosate**

Glyphosate is formulated as a salt, thus making the product highly water-soluble. The formulated product consists of the parent glyphosate acid bound to a salt by a weak electrostatic bond. Because this bond is weak the salt and glyphosate can readily disassociate once in solution. In solution, glyphosate exists as a monovalent, divalent, or trivalent anion, depending on pH of the solution. Other cationic salts are likely to bind to the glyphosate molecule. High concentrations of sodium (Na) salts are common in some South Carolina water sources and may reduce weed control by binding to glyphosate. When Na salts form bonds with glyphosate, a crystalline structure will result on the plant leaf surface, reducing absorption and weed control. This antagonism may be alleviated through the addition of 8.5 lbs of ammonium sulfate (AMS) per 100 gallons of water, in turn improving weed control. AMS binds free salt molecules, preventing the formation of the non-absorbable crystalline salt/glyphosate complex.

Another means of minimizing the effect of salts on glyphosate activity is to reduce spray volume per acre. For instance, the number of glyphosate molecules in a spray solution will be constant, regardless of spray volume changes. When the spray volume is reduced from 20 to 10 gallons/acre, the number of salt molecules that could potentially interact with glyphosate is reduced by 50%. In addition, spray droplet size will be reduced as spray volume is lowered, concentrating glyphosate molecules within the droplet, facilitating glyphosate movement into the plant via diffusion.

### **Adjuvant Addition to Roundup (Glyphosate)**

Surfactant is needed with glyphosate to maximize leaf wetting and herbicide absorption. Many companies are now producing a formulated glyphosate that contains surfactant while other glyphosate products still require the addition of surfactant. Increased necrotic leaf speckling is common when additional surfactant is added to glyphosate products that already contain adjuvant as part of the formulated product. The addition of surfactant to a surfactant-based glyphosate product also causes leaf burn on many weed species, failing to improve weed control and glyphosate absorption. Thus, if a glyphosate product contains an adjuvant, do not add additional surfactant.

### **Weed Removal and Roundup Timing**

Early-season weed interference does reduce soybean yields. Do not delay applying Roundup, hoping that one application will be sufficient for season-long weed control. Waiting 5 to 7 weeks after soybean emergence before applying glyphosate will substantially reduce yields. In the absence of a preemergence herbicide, Roundup generally needs to be applied no later than three weeks after crop emergence to prevent early-season weed interference and subsequent yield loss.

As with other herbicides, Roundup rate can be varied according to weed size and spectrum. For instance, Roundup is highly effective on Palmer amaranth and grasses. Use rates can be reduced as much as 50% when these weeds are small (Palmer amaranth < 12 inches, grasses < 4 inches), without sacrificing weed control. However, morningglories, nutsedges, and Florida pusley are more difficult to control with Roundup and thus, reduced rates should not be used on these weeds unless another product is tank-mixed with Roundup to ensure adequate weed control.

PRODUCT NAME	FORMULATION	ACTIVE INGREDIENT	MANUFACTURER	MODE OF ACTION
ASSURE II	0.88 EC	quazilofop	DuPont	ACCCase inhibitor
AUTHORITY	75 WDG	sulfentrazone	DuPont	PPO inhibitor
BASAGRAN	4 S	bentazon	Micro Flo	PSII inhibitor
BOUNDARY	7.8 L	S-metolachlor (6.3) + metribuzin (1.5)	Syngenta	cell division inhibitor PSII inhibitor
CANOPY	58.3 DG	metribuzin (50%) chlorimuron (8.3%)	DuPont	PSII inhibitor ALS inhibitor
CANOPY XL	56.3 DG	sulfentrazone (46.9%) chlorimuron (9.4%)	DuPont	PPO inhibitor ALS inhibitor
CLASSIC	25 DF	chlorimuron	DuPont	ALS inhibitor
COBRA	2 EC	lactofen	Valent	PPO inhibitor
COMMAND	3 ME	clomazone	FMC	carotenoid biosynthesis
DUAL II MAGNUM	7.64 EC	S-metolachlor	Syngenta	cell division inhibitor
FIRSTRATE	84 WDG	chloransulam-methyl	DowAgroSciences	ALS inhibitor
FLEXSTAR	1.88 L	fomesafen	Syngenta	PPO inhibitor
FRONTROW		flumetsulam chloransulam-methyl	DowAgroSciences	ALS inhibitor ALS inhibitor
FUSION	2.56 EC	fluazifop-P-butyl fenoxaprop-ethyl	Syngenta	ACCCase inhibitor ACCCase inhibitor
GLY-FLO	4 S	glyphosate	MicroFlo	EPSPS inhibitor
GLYFOS	4 S	glyphosate	Cheminova	EPSPS inhibitor
GLYFOX X-TRA	4 S	glyphosate	Cheminova	EPSPS inhibitor
GLYPHOMAX	4 S	glyphosate	Dow AgroSciences	EPSPS inhibitor
GLYPHOMAX PLUS	4 S	glyphosate	Dow AgroSciences	EPSPS inhibitor
GRAMOXONE MAX	3 S	paraquat	Syngenta	PSI inhibitor
HARMONY GT	75 DF	thifensulfuron-methyl	DuPont	ALS inhibitor
LASSO	4 EC	alachlor	Monsanto	cell division inhibitor
MICRO-TECH	4 EC	alachlor	Monsanto	cell division inhibitor
PENDIMAX	3.3 EC	pendimethalin	Dow AgroSciences	microtubule assembly inhibitor
POAST	1.5 EC	sethoxydim	Micro Flo	ACCCase inhibitor
POAST PLUS	1.0 EC	sethoxydim	Micro Flo	ACCCase inhibitor
PROWL	3.3 EC	pendimethalin	BASF	microtubule assembly inhibitor
PROWL H <sub>2</sub> O	3.8 L	pendimethalin	BASF	microtubule assembly inhibitor

PRODUCT NAME	FORMULATION	ACTIVE INGREDIENT	MANUFACTURER	MODE OF ACTION
PURSUIT	70 DG 2 S	imazethapyr	BASF	ALS inhibitor
PYTHON	80 WDG	flumetsulam	Dow AgroSciences	ALS inhibitor
RAPTOR	1 S	imazamox	BASF	ALS inhibitor
REFLEX	2 L	fomesafen	Syngenta	PPO inhibitor
RESOURCE	0.86 EC	flumiclorac-pentyl	Valent	ALS inhibitor
ROUNDUP ORIGINAL	4 S	glyphosate	Monsanto	EPSPS inhibitor
SCEPTER	70 DG	imazaquin	BASF	ALS inhibitor
SELECT	2 EC	clethodim	Valent	ACCCase inhibitor
SENCOR	75 DF 4 L	metribuzin	Bayer CropScience	PSII inhibitor
SQUADRON	2.33 EC	imazaquin (0.33 lb) pendimethalin (2 lb)	BASF	ALS inhibitor microtubule assembly inhibitor
TREFLAN	4 HFP	trifluralin	Dow AgroSciences	microtubule assembly inhibitor
ULTRA BLAZER	2 L	acifluorfen	United Phosphorus	PPO inhibitor
VALOR	71 WP, WDG	flumoixazin	Valent	PPO inhibitor

DF = dry flowable, EC = emulsifiable concentrate, F = flowable, L = liquid, ME = micro-encapsulated, HFP = high flash point formulation, S - water solution, SC = soluble concentrate, WDG = water dispersible granule, WP = wettable powder.

### Crop Replant and Rotation Guide

Herbicide	Cotton	Corn	Peanut	Wheat	Tobacco	Other
Treflan	<i>none</i>	<i>5 months</i>	<i>none</i>	<i>5 months</i>	<i>5 months</i>	<i>5 months if not labeled</i>
Prowl	<i>none</i>	<i>none</i>	<i>none</i>	<i>4 months</i>	<i>none</i>	<i>next year</i>
Dual II Magnum	<i>none</i>	<i>none</i>	<i>none</i>	<i>4.5 months</i>	<i>next year</i>	<i>next year</i>
Frontier/Outlook	<i>next year</i>	<i>none</i>	<i>none</i>	<i>4 months</i>	<i>next year</i>	<i>next year</i>
Sencor	<i>8 months</i>	<i>4 months</i>	<i>18 months</i>	<i>4 months</i>	<i>12 months</i>	<i>18 months</i>
Micro-Tech/Lasso	<i>next year</i>	<i>next year</i>	<i>next year</i>	<i>next year</i>	<i>next year</i>	<i>next year</i>
Canopy (pH ≤ 7.0)	<i>10 months</i>	<i>9 months</i>	<i>8 months</i>	<i>4 months</i>	<i>10 months</i>	<i>18 months</i>
Canopy (pH 7.0-7.5)	<i>18 months</i>	<i>18 months</i>	<i>18 months</i>	<i>4 months</i>	<i>18 months</i>	<i>30 months</i>
Canopy XL (pH ≤ 7.0)	<i>18 months</i>	<i>10 months</i>	<i>18 months</i>	<i>4 months</i>	<i>10 months</i>	<i>18 months</i>
Canopy XL (pH > 7.0)	<i>30 months</i>	<i>18 months</i>	<i>30 months</i>	<i>4 months</i>	<i>18 months</i>	<i>30 months</i>
Python	<i>18 months</i>	<i>none</i>	<i>4 months</i>	<i>4 months</i>	<i>9 months</i>	<i>26 months</i>
Valor	<i>2 months</i>	<i>2 months</i>	<i>none</i>	<i>2 months</i>	<i>2 months</i>	<i>12 months</i>
Command	<i>9 months</i>	<i>9 months</i>	<i>9 months</i>	<i>12 months</i>	<i>none</i>	<i>12 months</i>
Scepter	<i>18 months</i>	<i>9.5 months</i>	<i>11 months</i>	<i>3 months</i>	<i>9.5 months</i>	<i>18 months</i>
Pursuit	<i>9.5 months</i>	<i>next year</i>	<i>none</i>	<i>3 months</i>	—	<i>18 months</i>
Squadron	<i>18 months</i>	<i>9.5 months</i>	<i>11 months</i>	<i>4 months</i>	<i>9.5 months</i>	<i>18 months</i>
Boundary	<i>8 months</i>	<i>8 months</i>	<i>18 months</i>	<i>4.5 months</i>	<i>12 months</i>	<i>18 months</i>
Ultra Blazer	<i>none</i>	<i>none</i>	<i>none</i>	<i>none</i>	<i>none</i>	<i>18 months</i>
Flexstar/Reflex	<i>10 months</i>	<i>10 months</i>	<i>10 months</i>	<i>4 months</i>	<i>18 months</i>	<i>18 months</i>
Cobra	<i>none</i>	<i>none</i>	<i>none</i>	<i>none</i>	<i>none</i>	—
Basagran	<i>none</i>	<i>none</i>	<i>none</i>	<i>none</i>	<i>none</i>	<i>none</i>
Classic	<i>10 months</i>	<i>10 months</i>	<i>8 months</i>	<i>4 months</i>	<i>10 months</i>	<i>18 months</i>
Harmony GT	<i>45 days</i>	<i>none</i>	<i>45 days</i>	<i>none</i>	<i>45 days</i>	<i>45 days</i>
Frontrow	<i>9 months</i>	<i>9 months</i>	<i>9 months</i>	<i>3 months</i>	<i>30 months</i>	<i>30 months</i>
Raptor	<i>9 months</i>	<i>8.5 months</i>	<i>9 months</i>	<i>3 months</i>	<i>9 months</i>	<i>18 months</i>
FirstRate	<i>9 months</i>	<i>9 months</i>	<i>9 months</i>	<i>3 months</i>	<i>30 months</i>	<i>9 months</i>
Roundup	<i>none</i>	<i>none</i>	<i>none</i>	<i>none</i>	<i>none</i>	<i>none</i>
Assure II	<i>none</i>	<i>none</i>	<i>none</i>	<i>none</i>	<i>none</i>	<i>none</i>
Poast, Poast Plus	<i>none</i>	<i>none</i>	<i>none</i>	<i>none</i>	<i>none</i>	<i>none</i>
Select	<i>none</i>	<i>none</i>	<i>none</i>	<i>none</i>	<i>none</i>	<i>none</i>

Other = All crops not specified. Refer to the label for specific recropping intervals.

<b>Herbicide</b>	<b>Grazing and Forage Restrictions</b>
<i>Gramoxone Max</i>	<i>Do not harvest for forage or hay prior to early pod stage.</i>
<i>Treflan</i>	<i>No restrictions on label.</i>
<i>Prowl</i>	<i>Livestock can graze or be fed soybean forage from treated fields.</i>
<i>Dual II Magnum</i>	<i>No restrictions on label.</i>
<i>Frontier/Outlook</i>	<i>Do not graze or feed forage, hay or straw to livestock.</i>
<i>Sencor</i>	<i>Treated soybean forage may be grazed or fed to livestock 40 days after application.</i>
<i>Micro-Tech/Lasso</i>	<i>Do not feed forage, hay, or straw to livestock.</i>
<i>Canopy</i>	<i>Do not graze treated fields or harvest for forage or hay.</i>
<i>Canopy XL</i>	<i>Do not graze treated fields or harvest for forage or hay.</i>
<i>Python</i>	<i>Do not graze or feed treated soybean forage, hay or straw to livestock.</i>
<i>Pursuit</i>	<i>Do not graze or feed treated soybean forage, hay or straw to livestock.</i>
<i>Valor</i>	<i>No restrictions on label.</i>
<i>Command</i>	<i>Do not allow livestock to graze on treated soybean vines or feed treated vine trash (soybean plants) to livestock.</i>
<i>Scepter</i>	<i>Do not graze or feed treated soybean forage, hay or straw to livestock.</i>
<i>Squadron</i>	<i>Do not graze or feed treated soybean forage, hay or straw to livestock.</i>
<i>Boundary</i>	<i>Do not graze or harvest for food or feed.</i>
<i>Ultra Blazer</i>	<i>Do not use treated plants for feed or forage.</i>
<i>Flexstar/Reflex</i>	<i>Do not graze treated areas or harvest for forage or hay. Do not graze rotated small grain crops or harvest for livestock forage or straw.</i>
<i>Cobra</i>	<i>Do not graze animals on green forage or stubble. Do not utilize hay or straw for animal feed or bedding.</i>
<i>Basagran</i>	<i>No restrictions on label.</i>
<i>Classic</i>	<i>Do not graze treated fields or harvest for forage or hay.</i>
<i>Harmony GT</i>	<i>Do not graze or feed forage or hay from treated areas to livestock (harvested straw may be used for bedding and/or feed).</i>
<i>Frontrow</i>	<i>No restrictions on label.</i>
<i>Scepter</i>	<i>Do not graze or feed treated soybean forage, hay or straw to livestock.</i>
<i>Pursuit</i>	<i>Do not graze or feed treated soybean forage, hay or straw to livestock.</i>
<i>Raptor</i>	<i>No restrictions on label.</i>
<i>FirstRate</i>	<i>Do not harvest for forage or hay for 14 days.</i>
<i>Roundup</i>	<i>Do not feed treated soybean for 8 weeks after application. Allow 14 days following spot treatment before grazing livestock.</i>
<i>Assure II</i>	<i>Do not graze treated fields or harvest for forage or hay.</i>
<i>Poast, Poast Plus</i>	<i>Do not graze treated fields and do not feed treated soybean forage or ensilage to livestock.</i>
<i>Select</i>	<i>Do not graze treated fields or feed treated forage or hay to livestock.</i>

**Guide to Weed and Soybean Response to Soybean Herbicides**

<b>Preplant Incorporated/ Preemergence</b>	large crabgrass	goosegrass	Texas panicum	broadleaf signalgrass	johnsongrass (seedling)	johnsongrass (rhizome)	yellow nutsedge	purple nutsedge	prickly sida	tropic croton	velvetleaf	common cocklebur	pitted morningglory	entireleaf morningglory	tall morningglory	cypressvine morningglory	smallflower morningglory	red morningglory	sicklepod	coffee senna	Florida beggarweed	hophornbeam copperleaf	Palmer amaranth	smooth pigweed	Pennsylvania smartweed	Florida pusley	Crop tolerance G=Good F=Fair
<i>Treflan (PPI only)</i>	E	E	F	F	G	P	P	P	P	P	P	P	P	P	P	--	--	--	P	P	P		G	G	P	E	G
<i>Prowl</i>	E	E	F	F	G	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		G	G	P	E	G
<i>Dual II Magnum</i>	E	E	P	G	P	P	G	P	F	P	P	P	P	P	P	--	F	P	P	P	F		G	G	P	G	G
<i>Frontier/Outlook</i>	G	G	F	G	P	P	F	P	P	P	P	P	P	P	P	--	--	--	P	P	P		E	E	--	--	G
<i>Sencor</i>	F	G	P	F	P	P	P	P	G-E	F	F	P	F-G	P-F	P-F	F-G	G	F	F-G	F-G	E		G	G	F-G	G	F
<i>Micro-Tech/Lasso</i>	E	E	F	G	P	P	G	P	G	P	P	P	P	P	P	--	F	--	P	P	F		G	G	P	G	G
<i>Canopy</i>	F	F	P	F	P	P	P	P	G-E	F-G	F	G-E	G	G	G	F-G	G	--	G	F-G	E		E	E	G	E	G
<i>Canopy XL</i>	E	F	P	F	F	P	G	G	F-G	E	--	F-G	F-G	G-E	G-E	E	G-E	--	P	E	E		G-E	G-E	G-E	E	F
<i>Python</i>	P	P	P	P	P	P	P	P	E	P	F	E	F	F-G	F-G	F-G	G-E	F-G	F	F	F		E	E	G	G	G
<i>Pursuit</i>	P	P	P	P	P	P	G	F	G-E	P	--	F-G	G	G	G	G	E	G	P	F-G	P		E	E	--	E	G
<i>Valor (PRE only)</i>	P	P	P	P	P	P	P	P	G-E	G	--	P	F	F-G	F-G	G	G-E	G	P	P-F	G-E		G	G	P-F	G-E	F
<i>Command</i>	E	E	G	E	F	P	P	P	G	G	E	P	P	P	P	--	G	P	P	F	P		P	P	G	P	G
<i>Scepter</i>	F	F	F	F	F	P	F	P	G	P	F	E	E	P-F	F	F-G	G	F	F-G	F	P		E	E	G	G-E	G
<i>Squadron</i>	E	E	G	G	F	P	F	P	G	P	F-G	G	E	G	G	F	G	G	P	P	P		E	E	E	E	G
<i>Boundary</i>	E	E	--	--	--	--	F-G	--	--	--	--	--	F	F	--	--	--	--	P	--	--		G-E	G-E	--	--	G

Weed Control Rating Scale: E = Excellent (>90%); G = Good (80-89%); F = Fair (70-79%); P = Poor (<70%)

A rating of 'Excellent' or 'Good' is considered acceptable control.

Dashes indicate insufficient data

**Guide to Weed and Soybean Response to Soybean Herbicides**

<b>Postemergence - OT</b>	large crabgrass	goosegrass	Texas panicum	broadleaf signalgrass	johnsongrass (seedling)	johnsongrass (rhizome)	yellow nutsedge	purple nutsedge	prickly sida	tropic croton	velvetleaf	common cocklebur	pitted morningglory	entireleaf morningglory	tall morningglory	cypressvine morningglory	smallflower morningglory	red morningglory	sicklepod	coffee senna	Florida beggarweed	hophornbeam copperleaf	Palmer amaranth	smooth pigweed	Pennsylvania smartweed	Florida pusley	Crop tolerance G=Good F=Fair
<i>Ultra Blazer</i>	P	P	P	P	P	P	P	P	P	E	P	F-G	E	G	G	G-E	G-E	G-E	P	P	P-F	G	G	E	F-G	E	F
<i>Flexstar/Reflex</i>	P	P	P	P	P	P	P	P	P	E	F	G	E	G	G	G-E	G	G-E	P	P	P-F	G	G	E	F-G	G	F
<i>Cobra</i>	P	P	P	P	P	P	P	P	P	E	F-G	G	E	G	G	G-E	G-E	G-E	P	P	P-F	E	G	E	F-G	G	F
<i>Basagran</i>	P	P	P	P	P	P	G	P	G	F-G	P	E	P	P	P	G-E	G-E	F-G	P	F-G	P	P	P	P	G	P	G
<i>Classic</i>	P	P	P	P	P	P	F	P	P	P	G	E	G	G	G	P	G-E	G-E	G	P	G-E	P	G	G	G	E	F
<i>Harmony GT</i>	P	P	P	P	E	P	P	P	P	P	--	F	F-G	F-G	F-G	--	--	--	P	--	--	--	E	E	E	--	G
<i>Frontrow</i>	P	P	P	P	P	P	P	P	F-G	--	G	E	E	G	G	G	G-E	G	P-F	--	F-G	--	P	P	G	F	G
<i>Scepter</i>	P	P	P	P	G-E	P	P	P	F-G	P	P	E	G-E	P	P	F	F	F-G	F-G	F	P	P	G	G	F	F	G
<i>Pursuit</i>	F	G	F	F-G	F-G	F	G	G	F-G	P	F	E	G	G	G	G	G	G	P	--	P	P	G-E	G-E	G-E	P	G
<i>Raptor</i>	F	--	--	F	G	P	P	P	P	--	--	G	G	G	G	--	--	--	P	--	--	P	--	--	G-E	--	G
<i>FirstRate</i>	P	P	P	P	P	P	P	P	P	P	G	G	E	G-E	F-G	G	G	G	F-G	--	F-G	--	P	P	F-G	F	G
<i>Roundup (1 application)</i>	E	E	E	E	E	E	F	F	F	G	F	E	F	F	F	G	G	G	E	E	E	P-F	E	E	P	P-F	G
<i>Roundup (2 applications)</i>	E	E	E	E	E	E	G-E	G-E	G-E	G-E	G	E	G-E	G-E	G-E	E	E	E	E	E	E	G	E	E	F-G	F-G	G
<i>Assure II</i>	G-E	G-E	G	G	E	G-E	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	G
<i>Poast, Poast Plus</i>	E	E	E	E	E	F-G	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	G
<i>Select</i>	E	E	E	E	E	G	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	G

Weed Control Rating Scale: E = Excellent (>90%); G = Good (80-89%); F = Fair (70-79%); P = Poor (<70%)  
 A rating of 'Excellent' or 'Good' is considered acceptable control; Dashes indicate insufficient data

PRODUCT NAME	USE RATE	PHI
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## PREPLANT BURNDOWN

<b>paraquat</b>	0.49 to 1.0 lb ai/A	
GRAMOXONE MAX 3S 3 lb ai/gal	1.3 to 2.7 pt/A	N/A

Remarks: Restricted-Use Pesticide. Annual grasses and broadleaf weeds plus top-kill of some perennials. Use 1.3 to 1.7 pt/A if weeds are 1 to 3 inches tall; use 1.7 to 2.0 pt/A if weeds are 3 to 6 inches tall; use 2.0 to 2.7 pt/A if weeds are 6 inches or greater in height. Control of weeds greater than 6 inches tall may be poor. Apply at planting or immediately after. Add 1.0 qt nonionic surfactant or 1 gal crop oil concentrate/100 gallons spray solution. Control of horseweed or eveningprimrose is generally poor. Rainfast in 30 min. Gramoxone MAX will provide top-kill of bermudagrass and johnsongrass, but control is generally not satisfactory. Gramoxone MAX does not provide residual weed control. Refer to Gramoxone MAX label or other herbicide labels for registered tank mixes with Gramoxone MAX.

<b>glyphosate</b>	0.68 to 1.38 lb ai/A	
ROUNDUP WEATHERMAX SL 5.5 lb ai/gal (4.5 lb ae)	16 to 32 oz/A	N/A

Remarks: Annual grasses and broadleaf weeds; suppression of some perennials. Apply at planting or immediately after in 10 to 40 gal/A. Use 16 to 22 oz/A if weeds are less than 6 inches tall and 22 to 32 oz/A if weeds are greater than 6 inches in height. Roundup WeatherMax does not provide residual weed control. Roundup will control many weeds at 16 to 22 oz/A using a spray volume of 3 to 10 gal/A -refer to label for specific directions. **Numerous other glyphosate products are labeled for use as a burndown.**

## PREPLANT INCORPORATED

<b>trifluralin</b>	0.5 to 1 lb ai/A	
TREFLAN and others 4 lb ai/gal	1.0 to 2.0 pt/A	N/A

Remarks: Annual grasses and some small-seeded broadleaf weeds, seedling johnsongrass; poor control of large-seeded broadleaf weeds. Use 2.0 to 3.0 pt/A for rhizome johnsongrass control. For better pigweed control, use 1.5 pt/A on coarse-textured soils and 2.0 pt/A on medium-textured soils. Incorporate 2 to 3 inches deep immediately after application. Cross disk for best results. Applying several weeks before crop planting will reduce in-crop weed control. NOTE: The presence of a Palmer amaranth (pigweed) biotype that is resistant to dinitroaniline herbicides such as Treflan, Prowl, and Sonalan has been confirmed in some areas of South Carolina. The use of other herbicides (i.e. not dinitroanilines) is recommended for Palmer amaranth control where this biotype exists.

<b>pendimethalin</b>	0.5 to 1.0 lb ai/A	
PROWL 3.3 EC 3.3 lb ai/gal	1.2 to 2.4 pt/A	N/A

Remarks: Annual grasses and some small-seeded broadleaf weeds, seedling johnsongrass; poor control of large-seeded broadleaf weeds. Use 2.4 to 3.6 pt/A for rhizome johnsongrass control. For better pigweed control, use 1.8 pt/A on coarse-textured soils and 2.4 pt/A on medium-textured soils. Incorporate to a depth of 2 to 3 inches within 7 days after application. Cross disk for best results. Applying several weeks before planting will reduce in-crop weed control. NOTE: The presence of a Palmer amaranth (pigweed) biotype that is resistant to dinitroaniline herbicides such as Treflan, Prowl, and Sonalan has been confirmed in some areas of South Carolina. The use of other herbicides (i.e. not dinitroanilines) is recommended for Palmer amaranth control where this biotype exists.

<b>ethalfluralin</b>	0.56 to 0.94 lb ai/A	
SONALAN HFP EC 3 lb ai/gal	1.5 to 2.5 pt/A	N/A

Remarks: Annual grasses and some small-seeded broadleaf weeds; poor control of large-seeded broadleaf weeds. Incorporate to a depth of 2 to 3 inches within 2 days after application. Cross disk for best results. Sonalan may be applied up to 3 weeks before planting. Do not graze or forage crops grown on treated soil or cut for hay or silage. NOTE: The presence of a Palmer amaranth (pigweed) biotype that is resistant to dinitroaniline herbicides such as Treflan, Prowl, and Sonalan has been confirmed in some areas of South Carolina. The use of other herbicides (i.e. not dinitroanilines) is recommended for Palmer amaranth control where this biotype exists.

<b>S-metolachlor</b>	0.76 to 1.27 lb ai/A	
DUAL II MAGNUM EC 7.64 lb ai/gal	0.8 to 1.33 pt/A	N/A

Remarks: Controls annual grasses, small-seeded broadleaf weeds, and yellow nutsedge. Poor control of Texas panicum. Incorporate uniformly into the top 2 inches of soil. May be applied up to 14 days before planting but in-crop weed control may be diminished. Refer to the label for groundwater and surface water advisory statement.

<b>PRODUCT NAME</b>	<b>USE RATE</b>	<b>PHI</b>
<b>alachlor</b>	2.5 to 3 lb ai/A	
LASSO EC 4 lb ai/gal	2.5 to 3.0 qt/A	N/A
MICRO-TECH FL 4 lb ai/gal	2.5 to 3.0 qt/A	

Remarks: Annual grasses, small-seeded broadleaf weeds. Poor control of Texas panicum. Incorporate into the top 2 to 3 inches of soil before planting. Refer to label for specific directions. Incorporation on coarse soils may decrease the length of weed control. Refer to label for groundwater and surface water advisory statement.

<b>metribuzin</b>	0.25 to 0.375 lb ai/A	
SENCOR 4 FL 4 lb ai/gal	0.5 to 0.75 pt/A	N/A
SENCOR DF 0.75% ai	0.33 to 0.5 lb/A	

Remarks: Will provide some suppression of sicklepod and Florida beggarweed and will effectively control most other annual weeds. Must be tank-mixed with a labeled herbicide for grass control. There are restrictions concerning the texture and organic matter content of soils where this product is to be used. Refer to the product label. Some soybean varieties are extremely sensitive to metribuzin. Soybean injury may occur if used in conjunction with soil-applied organic phosphate pesticides, or if heavy rains occur soon after application. Refer to label for crop rotation instructions and groundwater advisory statement.

<b>imazaquin</b>	0.12 lb ai/A	
SCEPTER 70 DG WDG 70% ai	2.8 oz/A	N/A

Remarks: Annual broadleaf weeds. Scepter generally provides poor control of grasses. Incorporate uniformly into the top 1 to 2 inches of soil.

<b>metribuzin + chlorimuron</b>	0.28 to 0.375 lb ai/A	
CANOPY WDG 64.3 + 10.7% ai (75% ai)	6.0 to 8.0 oz/A	N/A

Remarks: Controls most broadleaf weeds. Will need to be applied with a herbicide that supplies effective grass control. Incorporate uniformly to a depth of 2 inches. Do not use on sands or soils with less than 0.5% organic matter. Some soybean varieties are extremely sensitive to metribuzin. Soybean injury may occur if Canopy is used in conjunction with soil-applied organic phosphate pesticides. Refer to label for ground water advisory statement.

<b>alachlor + trifluralin</b>	2.6 to 3 lb ai/A	
FREEDOM EC 2.67 + 0.33 lb ai/gal (3 lb/gal)	3.5 to 4.0 qt/A	N/A

Remarks: Annual grasses, some small-seeded broadleaf leaves. Apply within 14 days before planting and incorporate into the upper 2 inches of soil immediately after application. Freedom is a package mixture of alachlor and trifluralin (the active ingredients of Lasso and Treflan, respectively). Refer to label for ground water advisory statement.

<b>pendimethalin + imazaquin</b>	0.87 lb ai/A	
SQUADRON FL 2.0 + 0.33 lb ai/gal (2.33 lb/gal)	3.0 pt/A	N/A

Remarks: Controls annual grasses and broadleaves. Squadron is a package mixture of Prowl + Scepter. Incorporate uniformly into the top 1 to 2 inches of soil.

<b>sulfentrazone + chlorimuron</b>	0.16 to 0.23 lb ai/A	
CANOPY XL WDG 46.9 + 9.4% ai (56.3% ai)	4.6 to 6.4 oz/A	N/A

Remarks: Controls annual broadleaf weeds and nutsedge species; does not control sicklepod. If no postemergence treatment is planned, use 5.1 to 6.4 oz/A. For coarse-textured soils with 0.5 to 2.0% organic matter use 5.8 oz/A for season-long control of morningglory species and common cocklebur and improved suppression of yellow nutsedge. Rates may be reduced to 4.6 to 5.8 oz/A if a postemergence application of Classic or Classic + Harmony GT is planned. Incorporate uniformly into the top 1 to 2 inches of soil.

<b>PRODUCT NAME</b>		<b>USE RATE</b>	<b>PHI</b>
<b>flumetsulam</b>		0.04 to 0.06 lb ai/A	
PYTHON WDG	80% ai	0.8 to 1.2 oz/A	N/A

Remarks: Controls annual broadleaf weeds including common lambsquarters, pigweed species, prickly sida, ladythumb, Pennsylvania smartweed; generally provides adequate control of light to moderate infestations of Florida beggarweed, common ragweed, and sicklepod. Marginal control of common cocklebur and morningglory species. Apply and incorporate into the top 2 to 3 inches of soil up to 30 days before planting. Tank mix with a grass herbicide to broaden the spectrum of weeds controlled. Refer to product label for directions.

## PREEMERGENCE

<b>pendimethalin</b>		0.5 to 1.0 lb ai/A	
PROWL 3.3 EC	3.3 lb ai/gal	1.2 to 2.4 pt/A	N/A

Remarks: Annual grasses and small-seeded broadleaf weeds; poor control of large-seeded broadleaf weeds. Prowl generally provides better weed control if preplant incorporated. NOTE: The presence of a Palmer amaranth (pigweed) biotype that is resistant to dinitroaniline herbicides such as Treflan, Prowl, and Sonalan has been confirmed in some areas of South Carolina. The use of other herbicides (i.e. not dinitroanilines) is recommended for Palmer amaranth control where this biotype exists.

<b>alachlor</b>			
LASSO EC,	4 lb ai/gal	2.0 to 2.75 qt/A	N/A
MICTRO-TECH FL	4 lb ai/gal	2.0 to 2.75 qt/A	

Remarks: Annual grasses, small-seeded broadleaf weeds; poor control of Texas panicum. Refer to product label for groundwater and surface water advisory statement.

<b>S-metolachlor</b>		0.76 to 1.27 lb ai/A	
DUAL II MAGNUM EC	7.64 lb ai/gal	0.8 to 1.33 pt/A	N/A

Remarks: Annual grasses, small-seeded broadleaf weeds, yellow nutsedge; poor control of Texas panicum. Refer to product label for groundwater and surface water advisory statement.

<b>dimethenamid-p</b>		0.75 to 1.2 lb ai/A	
FRONTIER EC	6.0 lb ai/gal	16 to 25 oz/A	N/A

Remarks: Controls annual grasses and small-seeded broadleaf weeds. Suppresses yellow nutsedge. Refer to product label for information regarding groundwater contamination.

<b>clomazone</b>		0.75 to 1.25 lb ai/A	
COMMAND 3 ME	3 lb ai/gal	2.0 to 3.33 pt/A	N/A

Remarks: Controls annual grasses. Apply at planting or immediately after. Off-site movement of spray drift or vapor can cause foliar whitening or yellowing of some plants.

<b>alachlor + trifluralin</b>		2.6 to 3 lb ai/A	
FREEDOM EC	2.67 + 0.33 lb ai/gal (3 lb/gal)	3.5 to 4.0 qt/A	N/A

Remarks: Annual grasses, some small-seeded broadleaf leaves. Freedom is a package mixture of alachlor and trifluralin (the active ingredients of Lasso and Treflan, respectively). Refer to label for ground water advisory statement.

<b>imazaquin</b>		0.12 lb ai/A	
SCEPTER DG WDG	70% ai	2.8 oz/A	N/A

Remarks: Annual broadleaf weeds. Scepter generally provides poor control of grasses. Incorporate uniformly into the top 1 to 2 inches of soil.

PRODUCT NAME		USE RATE	PHI
<b>metribuzin</b>		0.25 to 0.375 lb ai/A	
SENCOR 4 FL	4 lb ai/gal	0.5 to 0.75 pt/A	N/A
SENCOR DF	0.75% ai	0.33 to 0.5 lb/A	

Remarks: Will provide some suppression of sicklepod and Florida beggarweed and will effectively control most other annual weeds. Must be tank-mixed with a labeled herbicide for grass control. There are restrictions concerning the texture and organic matter content of soils where this product is to be used. Refer to the product label. Some soybean varieties are extremely sensitive to metribuzin. Soybean injury may occur if used in conjunction with soil-applied organic phosphate pesticides, or if heavy rains occur soon after application. Refer to label for crop rotation instructions and groundwater advisory statement.

<b>metribuzin + chlorimuron</b>		0.28 to 0.375 lb ai/A	
CANOPY WDG	64.3 + 10.7% ai (75% ai)	6.0 to 8.0 oz/A	N/A

Remarks: Controls most broadleaf weeds. Will need to be applied with a herbicide that supplies effective grass control. Incorporate uniformly to a depth of 2 inches. Do not use on sands or soils with less than 0.5% organic matter. Some soybean varieties are extremely sensitive to metribuzin. Soybean injury may occur if Canopy is used in conjunction with soil-applied organic phosphate pesticides. Refer to label for ground water advisory statement.

<b>pendimethalin + imazaquin</b>		0.87 lb ai/A	
SQUADRON FL	2.0 + 0.33 lb ai/gal (2.33 lb/gal)	3.0 pt/A	90 days

Remarks: Controls annual grasses and broadleaves. Squadron is a package mixture of Prowl + Scepter. Incorporate uniformly into the top 1 to 2 inches of soil.

<b>sulfentrazone + chlorimuron</b>		0.16 to 0.23 lb ai/A	
CANOPY XL WDG	46.9 + 9.4% ai (56.3% ai)	4.6 to 6.4 oz/A	N/A

Remarks: Controls annual broadleaf weeds and nutsedge species; does not control sicklepod. If no postemergence treatment is planned, use 5.1 to 6.4 oz/A. For coarse-textured soils with 0.5 to 2.0% organic matter use 5.8 oz/A for season-long control of morningglory species and common cocklebur and improved suppression of yellow nutsedge. Rates may be reduced to 4.6 to 5.8 oz/A if a postemergence application of Classic or Harmony GT is planned.

<b>flumetsulam</b>		0.04 to 0.06 lb ai/A	
PYTHON WDG	80% ai	0.8 to 1.2 oz/A	N/A

Remarks: Controls annual broadleaf weeds including common lambsquarters, pigweed species, prickly sida, ladythumb, Pennsylvania smartweed; generally provides adequate control of light to moderate infestations of Florida beggarweed, common ragweed, and sicklepod. Marginal control of common cocklebur and morningglory species. Tank mix with a grass herbicide to broaden the spectrum of weeds controlled. Refer to product label for directions.

<b>S-metolachlor + metribuzin</b>			
BOUNDARY 7.8 L	6.3 lb ai/gal + 1.5 lb ai/gal	1.0 to 1.75 pt/A	N/A

Remarks: Soybean injury from metribuzin can occur on soils having pH above 7.0. Tank-mixing additional S-metolachlor will extend grass control.

PRODUCT NAME	USE RATE	PHI
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## POSTEMERGENCE

The herbicides below can be used over-the-top of soybeans.

<b>chlorimuron</b> CLASSIC WDG	25% ai	0.008 to 0.012 lb ai/A 0.5 to 0.75 oz/A	N/A
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Remarks: Annual broadleaf weeds such as sicklepod, morningglory, cocklebur, cowpea; yellow nutsedge. Apply to young, actively growing weeds. Application to weeds in the cotyledon stage is not recommended. Apply after soybeans reach the first trifoliolate leaf stage. Early application is essential for adequate weed control - refer to label for recommended weed growth stages. Add 1 qt surfactant or 1.0 gal crop oil concentrate/100 gal spray solution. A timely cultivation 2 to 3 weeks after treatment will often help provide adequate season-long weed control. If needed, a second application may be made 2 to 3 weeks after the initial application; do not exceed 1.5 oz/A total per season. Do not apply if rain is expected within 1 hour. May be applied with aerial equipment. Do not mix, load, or use within 50 ft of all wells.

<b>Imazamox</b> RAPTOR	1 lb ai/gal	0.031 to 0.039 lb ai/A 4 to 5 oz/A	N/A
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Remarks: Use the 4 oz/A rate when following a soil-applied grass herbicide. The 5 oz/A rate should be used if nonpreemergence herbicide was applied. Do not apply more than 5 oz/A/yr. A crop oil concentrate at 1 to 2 gallons/100 gallons of spray solution or a nonionic surfactant at 1 qt/100 gallons of spray solution is required.

<b>imazaquin</b> SCEPTER 70 WDG	70% ai	0.12 lb ai/A 2.8 oz/A	90 days
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Remarks: Annual broadleaf weeds such as cocklebur; will also control sicklepod when used in a sequential program. Apply before sicklepod exceeds the 1 to 2 true-leaf stage. Apply when weeds are actively growing. The addition of a nonionic surfactant or crop oil concentrate is required. The surfactant should contain at least 80% active ingredient and should be applied at a rate of 2 pt/100 gal spray solution. Apply crop oil concentrate according to label directions. A timely cultivation 2 to 3 weeks after application will often help provide adequate season-long weed control. Wait at least 10 days after application before cultivating. Do not tank mix Scepter with postemergence grass herbicides.

<b>flumetsulam + chloransulam-methyl</b> FRONTROW 80 WDG		0.42 oz/A	N/A
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Remarks: Apply prior to 50% flowering. Application prior to full emergence of the first soybean trifoliolate may cause temporary yellowing or chlorosis of soybean. Rainfree period is 2 hr.

<b>bentazon</b> BASAGRAN EC	4 lb ai/gal	0.75 to 1.0 lb ai/A 1.5 to 2.0 pt/A	N/A
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Remarks: Annual broadleaf weeds such as cocklebur, bristly starbur, jimsonweed, and smartweed; yellow nutsedge. Refer to the label for maximum weed heights. Apply Basagran to actively growing weeds. Oil concentrate may be added to improve control of weeds such as coffee senna, ragweed, and yellow nutsedge. Rainfall within 8 hours after application may nullify the effectiveness of Basagran. Basagran may be applied with aerial equipment.

<b>aciflourfen</b> ULTRA BLAZER EC	2 lb ai/gal	0.125 to 0.375 lb ai/A 0.5 to 1.5 pt/A	50 days
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Remarks: Annual broadleaf weeds such as cocklebur, pigweed, and morningglory. Refer to the label for recommended weed growth stages. Apply to actively growing weeds. Add nonionic surfactant at 1.0 pt/100 gal spray solution. Cultivation before or during application is not recommended. Do not cultivate within 5 days before or 3 to 7 days after application. Rainfall within 6 hours after application may reduce control. Ultra Blazer may be applied with aerial equipment.

<b>thifensulfuron-methyl</b> HARMONY GT WDG	75% ai	0.004 lb ai/A 0.083 oz/A	60 days
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Remarks: Recommended for control of Palmer amaranth (pigweed) up to 8 inches tall. Apply to actively growing weeds. Add 1 pt nonionic surfactant/100 gal spray solution. Apply to soybeans any time after they are at least 12 inches tall, but no later than 60 days before harvest. Cultivation before, during, or within 7 days after application is not recommended.

<b>PRODUCT NAME</b>		<b>USE RATE</b>	<b>PHI</b>
<b>fomesafen</b>		0.25 to 0.375 lb ai/A	
REFLEX EC	2.0 lb ai/gal	1.0 to 1.5 pt/A	N/A
FLEXSTAR	1.88 lb ai/gal	0.75 to 1.5 pt/A	

Remarks: Annual broadleaf weeds such as cocklebur, pigweed, and morningglory. Refer to the label for recommended weed growth stages. Apply to actively growing weeds. Add surfactant at 0.5 to 1.0 pt/25 gal spray solution or crop oil concentrate at 1 to 2 pt/25 gal spray solution. Do not cultivate within 7 days prior to application. Do not apply Reflex after soybeans begin blooming. Do not exceed 1.5 pt/ac per season. Do not apply if rainfall is expected within 4 hours. Do not graze treated areas or harvest for forage or hay. Small grains such as wheat, barley, and rye may be planted 4 months after application. Do not graze rotated small grain crops or harvest forage or straw for livestock. Cotton, corn, sorghum, and peanuts may be planted 10 months after application.

<b>lactofen</b>		0.2 lb ai/A	
COBRA EC	2.0 lb ai/gal	12.5 oz/ac	45 days

Remarks: Annual broadleaf weeds such as cocklebur, pigweed, and morningglory. Refer to the label for recommended weed growth stages. Apply to actively growing weeds. Apply to soybeans after the first trifoliate leaf expands. Add 1 to 2 pt crop oil concentrate or 2 pt nonionic surfactant/100 gal spray solution. Use 2 pt crop oil concentrate/100 gal spray solution for control of morningglory. Cobra maybe applied with aerial equipment. Do not cultivate prior to or during application. Rainfall within 0.5 hour after application may reduce effectiveness.

<b>imazethapyr</b>		0.063 lb ai/A	
PURSUIT DG WDG	70% ai	1.44 oz/A	N/A

Remarks: Annual grasses such as crabgrass; seedling johnsongrass; broadleaf weeds such as morningglory, smartweed, cocklebur, and pigweed; suppression of yellow nutsedge, purple nutsedge. Apply to young, actively growing weeds. Early application is essential for optimum weed control; refer to label for recommended weed growth stages. Add 1.0 qt nonionic surfactant/100 gal spray solution or 1.5 to 2 pt/A crop oil concentrate. A timely cultivation 7 to 10 days after application will often help provide adequate season-long weed control. Do not cultivate within 7 days after application. Pursuit should be applied a minimum of 1 hour before rainfall.

<b>glyphosate</b>		0.5 to 1 lb ai/A	
ROUNDUP WEATHERMAX	5.5 lb ai/gal	12 to 23 oz/A	N/A
NUMEROUS OTHERS			

Remarks: USE ONLY ON ROUNDUP READY SOYBEANS - other soybean varieties will be killed. Postemergence control of annual grasses and broadleaf weeds. Can be applied from cracking up through full flowering. Single or sequential applications may be made; do not exceed 2.0 lb ai/A/growing season. Refer to label for specific directions regarding weed size and use rates.

<b>chloransulam-methyl</b>		0.008 to 0.016 lb ai/A	
FIRSTRATE WDG	84% ai	0.15 to 0.3 oz/A	N/A

Remarks: Postemergence control of common cocklebur, jimsonweed, common ragweed, sicklepod, Pennsylvania smartweed. Applications made to sicklepod beyond the 1-leaf stage will likely result in reduced control. Refer to label for maximum recommended heights of other weeds. FirstRate does not control Palmer amaranth (pigweed). Add 1 to 2 pt nonionic surfactant plus 2.5 gal urea ammonium nitrate/100 gal spray solution or 1.2 gal crop oil concentrate/100 gal of spray solution. Application prior to full emergence of the first soybean trifoliate leaf may cause temporary yellowing or chlorosis. Aerial application of FirstRate is prohibited.

<b>sethoxydim</b>		0.14 to 0.19 lb ai/A	
POAST EC	1.5 lb ai/gal	1.0 pt/A	90 days
POAST PLUS EC	1.0 lb ai/gal	18 to 24 oz/A	

Remarks: Annual and perennial grasses - refer to label for recommended weed growth stages. Apply to actively growing grasses. Poast does not control sedges. Add 2 pt non-phytotoxic oil concentrate or Dash spray adjuvant. For control of johnsongrass, apply 1 pt/A. For control of common bermudagrass, apply 1.5 pt/A. If johnsongrass or bermudagrass regrowth occurs, make a subsequent application at 1.0 pt/A. A timely cultivation may prevent the need for a second application. Do not cultivate within 5 days before or 7 days after application. Do not apply if rainfall is expected within 1 hour after application. Do not tank mix with Classic or Scepter. Classic may cause antagonism if applied within 7 days prior to or 1 day after application of Poast.

<b>PRODUCT NAME</b>		<b>USE RATE</b>	<b>PHI</b>
<b>fluazifop-P-butyl</b> FUSILADE EC	2.0 lb ai/gal	0.125 to 0.188 lb ai/A 8.0 to 12.0 oz/A	N/A

*Remarks: Annual and perennial grasses; does not control sedges. For goosegrass 2 to 4 inches tall use 8 oz/A. For other annual grasses use 10 to 12 oz/A. Refer to label for more detailed information concerning use rates and for recommended weed growth stages. Apply to actively growing grasses. Do not apply after soybeans begin blooming. Add crop oil concentrate at 1 to 2 pt/25 gal spray solution or nonionic surfactant at 0.5 to 1.0 pt/25 gal spray solution. Do not cultivate within 7 days before or after application. Rainfall within 1 hour after application may reduce control. For johnsongrass and bermudagrass, apply 12 oz/A. If regrowth occurs, make a second application at 8 oz/A. Fusilade DX may be applied with aerial equipment.*

<b>quizalofop P-ethyl</b> ASSURE II EC MATADOR EC	2.0 lb ai/gal	0.11 to 0.125 lb ai/A 7.0 to 8.0 oz/A	80 days
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*Remarks: Annual grasses, johnsongrass, bermudagrass. Does not control sedges. For rhizome johnsongrass and bermudagrass control apply 10 oz/A. If regrowth occurs, make a subsequent application at 7 oz/A. Refer to the label for recommended weed growth stages. Apply to actively growing grasses. Add crop oil concentrate at 4 qt or a nonionic surfactant at 1 qt/100 gal spray solution. Apply postemergence broadleaf herbicides at least 24 hours after applying Assure II. Following application of a broadleaf herbicide, apply Assure II when grasses begin to develop new leaves. Do not cultivate within 7 days before or after application. Do not apply if rain is expected within 1 hour.*

<b>clethodim</b> SELECT 2EC	2.0 lb ai/gal	0.09 to 0.125 lb ai/A 6.0 to 8.0 oz/A	N/A
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*Remarks: Annual and perennial grasses; does not control sedges. For rhizome johnsongrass control, apply 8 to 16 oz/A. If regrowth occurs, make a subsequent application at 6 to 8 oz/A. For bermudagrass control, apply 8 to 16 oz/A. If regrowth occurs, make a subsequent application at the same rate. Refer to label for recommended weed growth stages. Apply to actively growing grasses. Add 1 gal crop oil concentrate/100 gal spray solution. Do not cultivate within 7 days before or after application. Do not apply if rainfall is expected within 1 hour.*