



BECK'S

RECOMMENDED HERBICIDE PROGRAMS FOR SOYBEANS

2019 Edition





FIGHT RESISTANCE. PROTECT YIELD.

When it comes to protecting yield in today's farming environment, quality products are of utmost importance in the face of resistant and tough-to-control weeds. By not controlling these weeds, studies have shown that yields can be reduced by more than 30 percent. At Beck's, our soybean lineup provides the most choices in technologies for the ultimate flexibility and weed control.

THE RIGHT PROGRAM

As important as the variety you plant is, it's equally important to find the right herbicide program to fit your needs. That's why we created our herbicide program recommendation guide; to help farmers mitigate confusion surrounding the technologies, both old and new, on the market, and to maximize yield across every acre.

We've identified six herbicide programs with multiple options to help guide your decision-making. When building your soybean herbicide program, some things to consider include:

- **What weeds are present in your fields?**
- **How many passes do you want to spray?**
- **What time of year do you want to make the applications?**

The programs and options in this guide are recommendations. Make sure to always read and follow label directions before making herbicide applications.

WHAT'S INSIDE

In this guide, you'll find a comprehensive collection of recommended herbicide programs and options for soybeans. New this year, we've added recommendations for fall burndown and the LibertyLink® GT27™ technology, an in-depth look at three tough-to-control weeds, and included helpful tables for herbicide timing and restrictions.

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BEFORE YOU GET STARTED... 6 TIPS FOR AN EFFECTIVE HERBICIDE PROGRAM

1. CARRIER VOLUME depends on whether a herbicide is contact or systemic. Contact herbicides will need a much higher carrier volume than systemic herbicides, especially when spraying a dense bed of weeds.

2. APPLICATION TIMING can also greatly influence herbicides. Typically, the best time to apply herbicides is during the sunniest and hottest part of the day (paraquat is the exception to this rule).

3. STARTING CLEAN makes it easier to stay clean. It is important to start with a clean burndown because this gives soil-applied residuals the best opportunity to succeed. Also, following the planter with a residual herbicide lays an unbroken blanket of protection down to prevent weed emergence.

4. UTILIZING MULTIPLE SITES OF ACTION (SOA) will help to keep troublesome weeds at bay and will help prevent weeds from becoming herbicide resistant in the future. It's important to vary herbicide modes of action (MOA) and sites of action (SOA) on the same acre. The SOA is the most important aspect of herbicides for prevention and control of resistant weeds.

5. PLANT SIZE AND HEIGHT are critical to get an adequate kill. Most herbicide labels have a recommended dosage to control a specific weed at a specific height. To terminate hard-to-kill weeds like Palmer amaranth and waterhemp, it's imperative to spray them when they are small, ideally 2 to 4 in. (or smaller than a soda can).

6. ALWAYS READ AND FOLLOW LABEL DIRECTIONS. Certain herbicides may be labeled as a restricted use pesticide. Certain herbicides may not be registered in all states and may be subject to use restrictions in some states. It is a violation of federal and state law to use any pesticide product in a manner inconsistent with its labeling. Check with your local chemical retailer and always read and follow label directions.

WATERHEMP

NAME: *Amaranthus rudis* (common)
Amaranthus tuberculatus (tall)

TYPE: Annual; highly prolific

WHERE: Common throughout the Midwest

IDENTIFICATION: The two species are so similar in appearance and control there is no need to distinguish in the field.

SHOWN RESISTANCE TO: To date, waterhemp populations have evolved resistance to six herbicide groups: 2 (ALS inhibitors); 4 (synthetic auxins); 5 (Photosystem II Inhibitors); 9 (EPSP Synthase Inhibitor); 14 (PPO Inhibitor); 27 (HPPD Inhibitor)

BIOLOGY: Waterhemp is a dioecious weed (plant is either male or female) meaning the plant must be cross-pollinated, which adds more genetic diversity to each plant.

There are many different phenotypic expressions and biological differences; each plant looks and acts uniquely - aiding the plant in developing resistance.

A single plant can produce 800,000+ seeds; seeds remain viable in the soil for four to six years. Seeds are very small and suited for shallow germination; well adapted for minimum and no-till farming systems.

GROWTH: Waterhemp grows very rapidly (1 to 1¼ in./day) and often germinates in very large quantities.

GERMINATION: Typically germinates in early spring, but can continue to germinate well into the fall as long as growing conditions are conducive.



CONTROL: Rapid emergence and growth will result in the need for products that have post-emergence activity or burndown activity. Products that have both residual and burndown activity can be used to clean up the few escapes and provide a residual barrier for summer annuals. Products with effective post-emergence activity may also need to be added to the tank mix to increase control. If planting is delayed or large flushes occur, a second burndown may be needed to ensure the residual product reaches the soil surface. If only a spring burndown is used, products such as Sharpen® and Gramoxone® can be very effective on waterhemp. However, these are contact products and control can be reduced if large populations of weeds are present. Increased carrier volume may be necessary. Once the cash crop emerges, Liberty® can be an effective option in LibertyLink® soybeans as well as XtendiMax®, Engenia®, or FeXapan™ in Roundup Ready 2 Xtend® soybeans. For non-GMO soybeans, using a Group 14 product such as Flexstar®, Cobra® or Ultra Blazer® can result in effective control if the population is susceptible. The key to successful waterhemp control is to never let it emerge. It is important to use multiple sites of action and overlay soil-applied residual herbicides. If a rescue application is needed, make sure the target waterhemp population is less than 4 in. tall.

Spring Burndown

	Followed by (FB) Pre-emergence	Rate (oz.)	SOA
1*	Sharpen® / Roundup PowerMAX®	1.5 / 32	14 / 9
	FB Gramoxone® SL 2.0 / Boundary®	40 / 32	22 / 5, 15
2	Gramoxone® / Metribuzin (75DF)	40 / 4-5	22 / 5
	FB Zidua® Pro / Roundup PowerMAX	6 / 32	2, 14, 15 / 9
3*	Sharpen / Roundup PowerMAX	1.5 / 32	14 / 9
	FB Fierce XLT / Roundup PowerMAX	4.5 / 32	2, 14, 15 / 9
4*	2,4-D LV6 / Roundup PowerMAX	22 / 32	4 / 9
	FB Authority MTZ / Gramoxone SL 2.0	10 / 40	5, 14 / 22
5*	Sharpen / Roundup PowerMAX	1.5 / 32	14 / 9
	FB Authority Supreme / Metribuzin (75DF)	8 / 4	14, 15 / 5

*Plant-back restriction

	Post-emergence Application	Rate (oz.)	SOA
1	Liberty® / Dual II Magnum® / Clethodim (2 lb. ai./gal.)	32 / 16 / 4 - 8	10 / 15 / 1
2	XtendiMax® / Warrant® / Roundup PowerMAX®	22 / 48 / 32	4 / 15 / 9

MARESTAIL

NAME: *Conyza canadensis*

TYPE: Winter annual

WHERE: Common throughout the Midwest, East, South

IDENTIFICATION: Leaves will have toothed margins and be covered with hairs. Mature plants can reach 6 ft. tall and have hairs on the stem and the leaves with no petioles

SHOWN RESISTANCE TO: To date, marestail populations have shown resistance to five herbicide groups: 2 (ALS inhibitors); 5, 7 (Photosystem II Inhibitors); 9 (EPSP Synthase Inhibitor); 22 (Photosystem I Electron Diverter)

BIOLOGY A single plant can produce up to 200,000 seeds by late summer.

Seeds are very small and can be carried long distances by the wind.

Germination can be hindered by soil disturbance, making marestail more problematic in no-till situations.

GROWTH: Plants that germinate in the fall will overwinter as a rosette and bolt in early spring. Plants that germinate in the spring will not overwinter as a rosette but will bolt shortly after germination.

GERMINATION: The extended germination period can make it more difficult to control compared to other winter annuals.



CONTROL: Since marestail can emerge both in the fall and spring, control can be more challenging compared to other winter annuals. Fall-emerged marestail can be effectively controlled with a fall burndown. However, once we reach early spring and soil temperatures begin to rise, new flushes can emerge. Spring emergence will result in the need for products that have post-emergence activity or burndown activity. Products that have both residual and burndown activity can be used to clean up the few escapes and provide a residual barrier for summer annuals. Products with effective post-emergence activity may also need to be added to the tank mix to increase marestail control. If planting is delayed or large flushes occur, a second burndown may be needed to ensure the residual product reaches the soil surface. If only a spring burndown is used, products such as Sharpen® and Gramoxone® can be very effective on marestail. However, these are contact products and control can be reduced in thick vegetation or after the plants have bolted. After the soybean crop has emerged, Liberty® can be an effective option in LibertyLink® soybeans as well as XtendiMax®, Engenia®, or FeXapan™ in Roundup Ready 2 Xtend® soybeans. For non-GMO soybeans, using a Group 2 product such as FirstRate® can result in effective control if the population is susceptible. Because marestail has developed resistance to five SOAs, control can be challenging. The key to successful marestail control is managing the plant when it is a rosette versus a plant that has bolted.

Spring Burndown

	Followed by (FB) Pre-emergence	Rate (oz.)	SOA
1*	Sharpen® / Liberty®	1.5 / 32	14 / 10
	FB Valor® XLT / Gramoxone® SL 2.0	3.5 / 40	2, 14 / 22
2	Gramoxone® SL 2.0/ Metribuzin FB	40 / 4-5	22 / 5
	FB Zidua® Pro / Roundup PowerMAX	6 / 32	2, 14, 15 / 9
3*	Sharpen / Roundup PowerMAX	1.5 / 32	14 / 9
	FB Fierce XLT / Roundup PowerMAX	4.5 / 32	2, 14, 15 / 9
4*	2,4-D LV6 / Roundup PowerMAX	22 / 32	4 / 9
	FB Authority MTZ / Gramoxone SL 2.0	10 / 40	5, 14 / 22
5*	Sharpen / Roundup PowerMAX	1.5 / 32	14 / 9
	FB Authority First / Metribuzin (75DF)	4 / 4	2, 14 / 5

*Plant-back restriction

	Post-emergence Application*	Rate (oz.)	SOA
1	Liberty / Clethodim (2 lb. ai./gal.)	32 / 4 - 8	10 / 1
2	XtendiMax / Roundup PowerMAX	22 / 32	4 / 9
3	FirstRate®** / Clethodim (2 lb. ai./gal.)	0.6 / 4 - 8	2 / 1

*Used following both fall or spring program

**Used for non-GMO soybeans. Populations of marestail may be resistant to FirstRate. Do not use FirstRate if Sonic or Authority First has been applied.

GIANT RAGWEED

NAME: *Ambrosia trifida*

TYPE: Summer annual; one of the earliest summer annuals to emerge in the spring, as early as March and continuing into July

WHERE: Midwest, Plains, Midsouth; loves fertile soils

IDENTIFICATION: Tall, rough and hairy plant; reaching as high as 16 ft. in height

RESISTANCE TO: Documented resistance to herbicide groups 2 (ALS inhibitors); and 9 (EPSP synthase inhibitors). Some populations have been found to be resistant to both.

BIOLOGY: Male flowers are very prolific, producing considerably more pollen than the female flowers need to pollinate a single plant.

Excessive pollen production allows a significant volume of cross-pollination, leading to genetic diversity and greater potential for herbicide resistance.

Seeds produced are larger than most weed species.

GROWTH: Rapid growth rate; out-competes the crop for sunlight, water and nutrients leading to yield losses, even at very low densities.

EMERGENCE: Emerges from deep in the soil, up to four inches, which allows giant ragweed to escape many residual pre-emergence herbicides persisting in the upper soil profile; emergence often promoted by tillage.

Long-term no-till practices leave giant ragweed seed on the soil surface, making it more prone to predation by insects, mice, and soil organisms, reducing the volume of the seed bank.



CONTROL: Emergence takes place both early and often throughout the spring and early summer. Effective herbicide options decrease significantly once the crop emerges. Thus, it is critical to control emerged giant ragweed populations prior to crop establishment. Burndown and pre-emergence applications should focus on eliminating any emerged seedlings and include residual herbicides effective against giant ragweed establishment. If planting is delayed after initial burndown applications, a secondary burndown application may be beneficial to control any newly emerged giant ragweed. Including products such as 2,4-D, Sharpen®, or Gramoxone® will improve the burndown. Avoid reliance on glyphosate alone for burndown control. When selecting residual herbicides, utilize multiple SOAs along with varying solubility amongst residual herbicides. This will provide several benefits: 1) greater flexibility of post-emergence treatment timing 2) higher percentage of on-label weed heights at the time of post-emergence application 3) risk management in both dry and wet spring/growing seasons. Giant ragweed control in post-emergence treatments is most easily achieved utilizing Liberty® in LibertyLink® soybeans or XtendiMax®, Engenia®, or FeXapan™ in Roundup Ready 2 Xtend® soybeans. For post-emergence treatments in glyphosate tolerant soybeans, glyphosate alone may not be sufficient as many populations are resistant or highly tolerant, and will benefit from the addition of a group 14 herbicide such as Flexstar®. Emergence of giant ragweed is not completely preventable, so it is essential to have adequate coverage along with the appropriate herbicide rate relative to weed height with all post-emergence treatments. Ideally, target giant ragweed when it is less than 6 in. tall.

Spring Burndown

	Followed by (FB) Pre-emergence	Rate (oz.)	SOA
1*	2,4-D LV6 / Roundup PowerMAX® FB Authority® First / Metribuzin (75DF)	22 / 32 4 / 4	4 / 9 2, 14 / 5
2	Gramoxone® SL 2.0/ Trivence®	40 / 8	22 / 2, 5, 14
3*	Sharpen® / Roundup PowerMAX® FB Fierce® XLT	1.5 / 32 4.5	14 / 9 2, 14, 15
4*	2,4-D LV6 / Roundup PowerMAX® FB Authority XL / Metribuzin (75DF)	22 / 32 4 / 4	4 / 9 2, 14 / 5
5*	Sharpen® / Roundup PowerMAX® FB Valor® XLT / Metribuzin (75DF)	1.5 / 32 3.5 / 4	14 / 9 2, 14 / 5

*Plant-back restriction

	Post-emergence Application*	Rate (oz.)	SOA
1	Liberty® / Clethodim (2 lb. ai./gal.)	36 - 43 / 4 - 8	10 / 1
2	XtendiMax® / Roundup PowerMAX®	22 / 32	4 / 9
3	Roundup PowerMAX® / Warrant® Ultra	44 / 48 - 70	9 / 14, 15

THREE-PASS SYSTEM RECOMMENDATIONS

OPTION 1

Timing	Rate/Acre	SOA #
Spring Early Burndown		
Sharpen® ♦	1.5 oz.	14
Roundup PowerMAX®	32 oz.	9
Dual II Magnum®	16 oz.	15
MSO	1%	
Pre-emergence		
Authority® MTZ	10 oz.	5,14
XtendiMax®	22 oz.	4
Post-emergence		
Roundup PowerMAX	32 oz.	9
FirstRate®	0.6 oz.	2
Zidua®	2 oz.	15
Clethodim (2 lb. ai./gal.)**	4 - 8 oz.	1

♦ Please note plant-back restrictions

** If needed to control volunteer glyphosate-tolerant corn

This option's spring burndown will result in the greatest residual value compared to options two and three. Authority® MTZ has limited control on some large-seeded, broadleaf weeds. However, Roundup PowerMAX® and XtendiMax® will provide effective post-emergence activity of large-seeded broadleaf weeds such as cocklebur, morningglory, and velvetleaf. In season, Zidua® will result in residual control of grasses and waterhemp, but will struggle on large-seeded broadleaf weeds. FirstRate® has both residual and post-emergence activity that increase the residual and post-emergence efficacy on large-seeded broadleaf weeds. FirstRate sprayed later in the season can cause carryover issues in corn the following year.

Individual results may vary. Always read and follow label directions.

OPTION 2

Timing	Rate/Acre	SOA #
Spring Early Burndown		
Roundup PowerMAX®	32 oz.	9
2, 4-D (LV6)†	22 oz.	4
Valor®	2 oz.	14
Pre-emergence		
Gramoxone® SL 2.0	40 oz.	22
Boundary®	32 oz.	5,15
COC	1%	
Post-emergence		
Roundup PowerMAX	32 oz.	9
Zidua®	2 oz.	15
Clethodim (2 lb. ai./gal.)**	4 - 8 oz.	1

† Please note plant-back restrictions

** If needed to control volunteer glyphosate-tolerant corn

Valor® and 2,4-D are effective in controlling marestalk and summer annuals like waterhemp. The addition of Gramoxone® SL 2.0 in the pre-emergence application will result in very effective burndown activity on weeds less than 6 in. tall. Boundary® will result in effective residual control of grasses and small-seeded broadleaf weeds. However, Boundary's control of large-seeded broadleaf weeds such as cocklebur, morningglory, and velvetleaf will be limited. The residual activity with Zidua® will struggle on large-seeded broadleaf weeds, which may result in new flushes late in the season.

OPTION 3

Timing	Rate/Acre	SOA #
Spring Early Burndown		
Sharpen® †	1.5 oz.	14
Roundup PowerMAX®	32 oz.	9
MSO	1%	
Pre-emergence		
Sonic®	3 oz.	2,14
Gramoxone® SL 2.0	40 oz.	22
COC	1%	
Post-emergence		
Roundup PowerMAX	32 oz.	9
Dual II Magnum® (or) Warrant®	16 oz./ 32 - 40 oz.	15
Clethodim (2 lb. ai./gal.)**	4 - 8 oz.	1

† Please note plant-back restrictions

** If needed to control volunteer glyphosate-tolerant corn

The spring burndown residual value will not be as great as in option one. Yet, Gramoxone® SL 2.0, a Group 22 herbicide, can result in effective control of weeds that may have escaped the spring burndown, especially if the weeds are less than 6 in. tall. Sonic® will result in greater control of larger-seeded broadleaf weeds compared to Authority® MTZ and Boundary®. Just like options one and two, Dual II Magnum® or Warrant® may be necessary in a post-emergence application to ensure effective residual grass control.

TWO-PASS SYSTEM RECOMMENDATIONS

OPTION 1

Timing	Rate/Acre	SOA #
Pre-emergence		
Roundup PowerMAX®	32 oz.	9
Fierce® XLT	4.5 oz.	2,14,15
Post-emergence		
Warrant®	32 - 40 oz.	15
Roundup PowerMAX	32 oz.	9
Clethodim (2 lb. ai./gal.)**	4 - 8 oz.	1

** If needed to control volunteer glyphosate-tolerant corn

The use of Fierce® XLT will result in effective weed control across a large, broad spectrum of weeds due to its three modes of action. Compared to many other products, Fierce XLT can provide longer residual control later into the season. However, in cool, wet conditions, Fierce XLT can cause PPO injury like other PPO-containing products such as Valor® and Authority®. The use of an in-season residual is not as crucial, as long as the Fierce XLT was activated by rainfall.

OPTION 2

Timing	Rate/Acre	SOA #
Pre-emergence		
Authority® XL (or) Valor® XLT	4 oz. (or) 3 oz.	2,14
XtendiMax®	22 oz.	4
Post-emergence		
Roundup PowerMAX®	32 oz.	9
Warrant®	32 - 40 oz.	15
Clethodim (2 lb. ai./gal.)**	4 - 8 oz.	1

** If needed to control volunteer glyphosate-tolerant corn

If utilizing this option, the pre-emergence herbicides will result in effective small and large-seeded broadleaf control, but less grass control compared to option one in this program. Therefore, the use of Roundup PowerMAX® and a Group 15 such as Warrant® will be crucial. If grass pressure is present at the time of the pre-emergence application, consider adding Roundup PowerMAX in the tank.

Individual results may vary. Always read and follow label directions.

OPTION 3

Timing	Rate/Acre	SOA #
Pre-emergence		
Roundup PowerMAX®	32 oz.	9
Zidua®	2 oz.	15
Post-emergence		
Warrant®	32 - 40 oz.	15
Roundup PowerMAX	32 oz.	9
XtendiMax®	22 oz.	4

SOA Group 15 products such as Warrant® and Zidua® have effective small-seeded broadleaf and grass control, but struggle on large-seeded broadleaf weeds such as cocklebur, morningglory, and velvetleaf. Roundup PowerMAX® provides effective post-emergence control of cocklebur, morningglory and velvetleaf. However, Roundup PowerMAX will not offer residual activity, therefore new flushes of large-seeded broadleaf weeds will be common if residuals are not applied. We typically see Group 15 herbicides break before 28 days after treatment (DAT), therefore an in-season residual like Warrant will likely be necessary.

OPTION 4

Timing	Rate/Acre	SOA #
Pre-emergence		
Authority® Elite	28 oz.	14,15
Metribuzin (75DF)	4 oz.	5
Roundup PowerMAX®	32 oz.	9
Post-emergence		
Warrant®	32 - 40 oz.	15
Roundup PowerMAX	32 oz.	9
Clethodim (2 lb. ai./gal.)**	4 - 8 oz.	1

** If needed to control volunteer glyphosate-tolerant corn

The use of Authority® Elite in option four will be very effective on grasses and waterhemp. The addition of metribuzin not only adds another mode of action, but also provides greater waterhemp and marestalk control. However, these products will struggle on large-seeded broadleaf weeds compared to option one and two, but will have greater control compared to option three.

Individual results may vary. Always read and follow label directions.

THREE-PASS SYSTEM RECOMMENDATIONS

Now fully approved, the LibertyLink® GT27™ technology provides flexibility to apply both Liberty® as well as glyphosate in post-emergence applications. The addition of glyphosate to Liberty will help to increase herbicide effectiveness, particularly on perennials, but also on grass species. The success of this tank-mix relies on proper management practices. Carrier volume, application timing, weed size, and nozzle selection will all be very similar to the Liberty platform to achieve greatest success. One caution with the use of this tank-mix will be the potential for antagonism to occur on drought-stressed grasses.

OPTION 1

Timing	Rate/Acre	SOA #
Spring Early Burndown		
Roundup PowerMAX®	32 oz.	9
2,4-D (LV6)♦	22 oz.	4
Pre-emergence*		
Authority® Supreme	8 oz.	14, 15
Metribuzin (75DF)***	4 oz.	5
Post-emergence		
Liberty®	36 oz.	10
Clethodim (2 lb. ai./gal.)**	4 - 8 oz.	1
Warrant®	32 - 40 oz.	15
AMS	2 - 3 lb.	

♦ Please note plant-back restrictions

* Add COC if new weeds emerge

** If needed to control volunteer glyphosate-tolerant corn

*** Caution on high pH soils

2,4-D is a cheap and effective option to control winter annuals like glyphosate-resistant marestail, and early-emerging summer annuals such as giant ragweed. However, option one burndown will have less residual activity compared to option two and three. Authority® Supreme will result in effective residual control of waterhemp as well as grasses. The addition of metribuzin provides post-emergence activity of waterhemp and marestail that may have escaped the burndown. For residual control of waterhemp, the pre-emergence application will have three effective SOAs. In the post-emergence application, Liberty® will result in effective post-emergence activity of weeds such as waterhemp. The addition of clethodim will help increase the post-emergence activity on grasses, and also control volunteer corn. Warrant® will result in residual control of grasses as well as small-seeded broadleaf weeds such as waterhemp.

Individual results may vary. Always read and follow label directions.

OPTION 2

Timing	Rate/Acre	SOA #
Spring Early Burndown		
2,4-D (LV6) [†]	22 oz.	4
Roundup PowerMAX	32 oz.	9
Sharpen [®] [†]	1 oz.	14
MSO	1%	
Pre-emergence		
Gramoxone [®] SL 2.0	40 oz.	22
Boundary [®]	32 oz.	5,15
COC	1%	
Post-emergence		
Liberty [®]	36 oz.	10
Clethodim (2 lb. ai./gal.) ^{**}	4 - 8 oz.	1
Zidua [®]	2 oz.	15
AMS	2 - 3 lb.	

[†] Please note plant-back restrictions

^{**} If needed to control volunteer glyphosate-tolerant corn

Sharpen[®] will increase control of marestail, waterhemp and giant ragweed, while providing residual activity. Gramoxone[®] SL 2.0 provides another SOA for marestail and waterhemp, but will have no residual activity. Boundary[®] contains a group 5 and 15 for effective residual control of waterhemp. The group 15 will provide residual grass and small-seeded broadleaf control. Liberty[®] and clethodim help with effective post-emergence control of escaped weeds, and the group 15 herbicide will also provide in-season residual.

OPTION 3

Timing	Rate/Acre	SOA #
Spring Early Burndown		
Gramoxone [®] SL 2.0	40 oz.	22
Metribuzin (75DF) ^{***}	4 - 5 oz.	5
COC	1%	
Pre-emergence		
Valor [®] XLT	3 oz.	2,14
Roundup PowerMAX	32 oz.	9
Post-emergence		
Liberty [®]	36 oz.	10
Glyphosate	32 oz.	9
Zidua [®]	2 oz.	15
AMS	2 - 3 lb.	

^{***} Caution on high pH soils

The addition of metribuzin to Gramoxone[®] SL 2.0 will result in burndown activity and will add residual control of future weeds. Residual activity with Valor[®] XLT will be effective on marestail, but also small-seeded summer annuals such as waterhemp. Valor XLT is a group 2 and 14 herbicide. The group 2 component will increase the large-seeded broadleaf control for weeds such as morningglory. Valor XLT will have greater large-seeded broadleaf control but have less grass control compared to Boundary[®] and Authority[®] Supreme.



TWO-PASS SYSTEM RECOMMENDATIONS

Now fully approved, the LibertyLink® GT27™ technology provides flexibility to apply both Liberty® as well as glyphosate in post-emergence applications. The addition of glyphosate to Liberty will help to increase herbicide effectiveness, particularly on perennials, but also on grass species. The success of this tank-mix relies on proper management practices. Carrier volume, application timing, weed size, and nozzle selection will all be very similar to the Liberty platform to achieve greatest success. One caution with the use of this tank-mix will be the potential for antagonism to occur on drought-stressed grasses.

OPTION 1

Timing	Rate/Acre	SOA #
Pre-emergence		
Zidua® Pro	6 oz.	2,14,15
Roundup PowerMAX®	32 oz.	9
2,4-D (LV6)♦	11 oz.	4
MSO	1%	
Post-emergence		
Liberty®	36 oz.	10
Clethodim (2 lb. ai./gal.)**	4 - 8 oz.	1
Dual II Magnum®	16 oz.	15
AMS	2 - 3 lb.	

♦ Please note plant-back restrictions

** If needed to control volunteer glyphosate-tolerant corn

Zidua® Pro will result in burndown as well as residual activity. The group 15 component will result in effective residual grass and waterhemp control. Zidua Pro will also provide effective burndown activity on marestalk thanks to the Sharpen® component. The addition of 2,4-D also increases the burndown activity of giant ragweed, marestalk and waterhemp. Liberty® will be effective on summer annuals and also marestalk that escaped the burndown/pre-emergence. A group 15 such as Dual® in the post-emergence application will provide an in-season residual barrier.

Individual results may vary. Always read and follow label directions.

OPTION 2

Timing	Rate/Acre	SOA #
Pre-emergence		
Valor® XLT	3 oz.	2,14
Metribuzin (75DF)***	4 oz.	5
Gramoxone® SL 2.0	40 oz.	22
COC	1%	
Post-emergence		
Liberty®	36 oz.	10
Glyphosate	32 oz.	9
Zidua®	2 oz.	15
AMS*	2 - 3 lb.	

* May cause crop response in high heat and humidity

*** Caution on high pH soils

Valor® XLT plus metribuzin will result in residual as well as post-emergence control of many weeds such as waterhemp and marestail. However, when Gramoxone® SL 2.0 and metribuzin are tank mixed together, they provide exceptional burndown activity on waterhemp and marestail. Valor XLT plus metribuzin will have slightly less residual control of grasses than Prefix® or Zidua® Pro, but it will have better control of large-seeded broadleaf weeds like morningglory and giant ragweed. Valor XLT will also have greater residual control of marestail compared to Prefix in option three.

OPTION 3

Timing	Rate/Acre	SOA #
Pre-emergence		
Roundup PowerMAX®	32 oz.	9
Metribuzin (75DF)***	4 oz.	5
Prefix®	32 oz.	14,15
Post-emergence		
Liberty®	36 oz.	10
Clethodim (2 lb. ai./gal.)**	4 - 8 oz.	1
Warrant®	32 - 40 oz.	15
AMS	2 - 3 lb.	

** If needed to control volunteer glyphosate-tolerant corn

*** Caution on high pH soils

Without the 2,4-D, option three will have no plant-back restriction, unlike option one. However, the burndown activity on giant ragweed will be less compared to the other options in the two-pass system. The addition of Prefix® will result in residual activity on waterhemp as well as grasses. Just like options one and two, the use of a group 15 such as Warrant® as an in-season residual can reduce new flushes of weeds after the post-emergence application.

Individual results may vary. Always read and follow label directions.

THREE-PASS SYSTEM RECOMMENDATIONS

OPTION 1

Timing	Rate/Acre	SOA #
Spring Early Burndown		
Roundup PowerMAX®	32 oz.	9
2,4-D (LV6)†	22 oz.	4
Pre-emergence		
Authority® First	4 oz.	2,14
Metribuzin (75DF)	4 oz.	5
Post-emergence		
Liberty®	36 oz.	10
Clethodim (2 lb. ai./gal.)	4 - 8 oz.	1
AMS	2 - 3 lb.	
Warrant®	32 - 40 oz.	15

† Please note plant-back restrictions

The addition of 2,4-D will result in effective control of glyphosate-resistant broadleaf weeds such as marestail. Authority® First will result in effective control of large-seeded broadleaf weeds such as morningglory and cocklebur, as well as small-seeded broadleaf weeds like waterhemp. The addition of metribuzin will increase the control of waterhemp and marestail. In season, Warrant® will provide a residual barrier preventing emergence of waterhemp and grasses. For best results, apply Liberty® using 20 gallons of water.

Individual results may vary. Always read and follow label directions.

OPTION 2

Timing	Rate/Acre	SOA #
Spring Early Burndown		
2,4-D (LV6)♦	22 oz.	4
Roundup PowerMAX®	32 oz.	9
Sharpen® ♦	1 oz.	14
MSO	1%	
Pre-emergence		
Gramoxone® SL 2.0	40 oz.	22
Boundary®	32 oz.	5,15
COC	1%	
Post-emergence		
Liberty®	36 oz.	10
Clethodim (2 lb. ai./gal.)	4 - 8 oz.	1
Zidua®	2 oz.	15
AMS	2 - 3 lb.	

♦ Please note plant-back restrictions

Sharpen® plus 2,4-D is a great option for glyphosate-resistant broadleaf weeds. Option two's burndown has greater residual value compared to option one. Gramoxone® SL 2.0 is very effective at controlling small weeds post-emergence. Boundary® will result in residual control of small-seeded broadleaf weeds such as waterhemp, and greater grass control compared to Authority® First, but less effective large-seeded broadleaf control. Zidua® will also provide an in-season residual barrier. For best results, apply Liberty® using 20 gallons of water.

Individual results may vary. Always read and follow label directions.

TWO-PASS SYSTEM RECOMMENDATIONS

OPTION 1

Timing	Rate/Acre	SOA #
Pre-emergence		
2,4-D (LV6) [♦]	11 oz.	4
Zidua [®] Pro	6 oz.	2,14,15
Roundup PowerMAX [®]	32 oz.	9
MSO	1%	
Post-emergence		
Liberty [®]	36 oz.	10
Clethodim (2 lb. a.i./gal.)	4 - 8 oz.	1
AMS	2 - 3 lb.	

[♦] Please note plant-back restrictions

The three modes of actions in Zidua[®] Pro will result in effective control across many weeds on the spectrum, including giant ragweed. Liberty[®] can result in effective control of weeds that have escaped Zidua Pro. The addition of clethodim will also increase the post-emergence grass efficacy. For best results, apply Liberty using 20 gallons of water.

Individual results may vary. Always read and follow label directions.

OPTION 2

Timing	Rate/Acre	SOA #
Pre-emergence		
Valor® XLT	3 oz.	2,14
Roundup PowerMAX®	32 oz.	9
Post-emergence		
Liberty®	36 oz.	10
Clethodim (2 lb. a.i./gal.)	4 - 8 oz.	1
AMS	2 - 3 lb.	

Just like Zidua® Pro, Valor® XLT will result in effective small-seeded broadleaf weed control such as waterhemp or marehail. However, Valor XLT grass control will be less effective compared to Zidua Pro. On the other hand, Valor XLT will result in greater control of large-seeded broadleaf weeds such as cocklebur, morningglory, and velvetleaf. For best results, apply Liberty® using 20 gallons of water.

OPTION 3

Timing	Rate/Acre	SOA #
Pre-emergence		
Gramoxone® SL 2.0	40 oz.	22
Prefix®	32 oz.	14,15
COC	1%	
Post-emergence		
Liberty®	36 oz.	10
Clethodim (2 lb. a.i./gal.)	4 oz.	1
Warrant®	32 - 40 oz.	15
AMS	2 - 3 lb.	

The use of Gramoxone® SL 2.0 will result in effective control of weeds less than 6 in. tall with no residual value. Prefix® will result in small-seeded broadleaf and grass control, but will have less residual value compared to Zidua® Pro and Valor® XLT. Though Prefix will have less control, PPO injury may be less compared to Valor XLT in cool, wet conditions. The addition of Warrant® will result in an extra residual barrier, which is more critical in this option compared to the others. For best results, apply Liberty® using 20 gallons of water.

Individual results may vary. Always read and follow label directions.

THREE-PASS SYSTEM RECOMMENDATIONS

OPTION 1

Timing	Rate/Acre	SOA #
Spring Early Burndown		
Roundup PowerMAX®	32 oz.	9
2,4-D (LV6)♦	22 oz.	4
Pre-emergence*		
Authority® MTZ	10 - 14 oz.	5,14
Gramoxone® SL 2.0	40 oz.	22
COC	1%	
Post-emergence		
Roundup PowerMAX	32 oz.	9
Warrant® Ultra	48 - 70 oz.	14,15
Clethodim (2 lb. a.i./gal.)**	4 - 8 oz.	1

* Soils must have minimum 1% O.M.

♦ Please note plant-back restrictions

** If needed to control volunteer glyphosate-tolerant corn

This burndown will provide a cheap but effective option when controlling glyphosate-resistant weeds like marestail. For the pre-emergence application, Authority® MTZ will result in effective waterhemp and marestail control, but less effective grass control. For the post-emergence residual, Warrant® Ultra consists of two parts: Warrant, as well as fomesafen, or Flexstar®. Fomesafen post-emergence activity has not been as effective on some waterhemp populations as it has been in the past. However, Warrant's residual activity is very effective on waterhemp.

Individual results may vary. Always read and follow label directions.

OPTION 2

Timing	Rate/Acre	SOA #
Spring Early Burndown		
Sharpen® ♦	1.5 oz.	14
Roundup PowerMAX®	32 oz.	9
MSO	1%	
Pre-emergence		
Boundary®	32 oz.	5,15
Gramoxone® SL 2.0	40 oz.	22
COC	1%	
Post-emergence		
Roundup PowerMAX®	32 oz.	9
Warrant® Ultra	48 - 70 oz.	14,15
Clethodim (2 lb. a.i./gal.)**	4 - 8 oz.	1

♦ Please note plant-back restrictions

** If needed to control volunteer glyphosate-tolerant corn

Sharpen® will result in effective control of glyphosate-resistant broadleaf weeds and will have greater residual value compared to option one's burndown. Gramoxone® SL 2.0 will help control any weeds that have escaped the burndown. Boundary® will have greater residual grass control compared to Authority® MTZ.

Individual results may vary. Always read and follow label directions.

TWO-PASS SYSTEM RECOMMENDATIONS

OPTION 1

Timing	Rate/Acre	SOA #
Pre-emergence		
Authority® XL	4 - 8 oz.	2,14
Roundup PowerMAX®	32 oz.	9
Post-emergence		
Roundup PowerMAX	32 oz.	9
Warrant® Ultra	48 - 70 oz.	14,15
Clethodim (2 lb. ai./gal.)**	4 - 8 oz.	1

** If needed to control volunteer glyphosate-tolerant corn

Authority® XL will result in effective control of small-seeded broadleaf weeds such as waterhemp and marehail, as well as large-seeded broadleaf weeds like cocklebur, morningglory, and velvetleaf. Authority XL grass control will be limited, therefore a grass herbicide such as Roundup PowerMAX® will be needed in the post-emergence application. The addition of Warrant® Ultra (Warrant and Flexstar® - fomesafen) will result in effective residual control of grasses as well as waterhemp. Just like other products that contain fomesafen, Warrant Ultra's post-emergence activity on waterhemp will be poor if the population is resistant.

Individual results may vary. Always read and follow label directions.

OPTION 2

Timing	Rate/Acre	SOA #
Pre-emergence		
Fierce® XLT	4.5 oz.	2,14,15
Gramoxone® SL 2.0	40 oz.	22
2,4-D (LV6)♦	11 oz.	4
COC	1%	
Post-emergence		
Roundup PowerMAX®	32 oz.	9
Flexstar® ■	18 - 25 oz.	14
Clethodim (2 lb. ai./gal.)**	4 - 8 oz.	1

♦ Please note plant-back restrictions

■ Use is dependent on geography

** If needed to control volunteer glyphosate-tolerant corn

Fierce® XLT will have excellent small and large-seeded broadleaf control. Unlike Authority® XL, Fierce XLT will have excellent grass control and will have greater residual value compared to the residual products in options one and three. The risk of PPO injury is greater in cool, wet conditions with Fierce XLT. Just like other programs that contain fomesafen, Flexstar's post-emergence control of waterhemp will be poor if the waterhemp population is resistant.

OPTION 3

Timing	Rate/Acre	SOA #
Pre-emergence		
Roundup PowerMAX®	32 oz.	9
Boundary®	32 oz.	5,15
2,4-D (LV6)♦	11 oz.	4
Post-emergence		
Roundup PowerMAX	32 oz.	9
Warrant® Ultra	48 - 70 oz.	14,15
Clethodim (2 lb. ai./gal.)**	4 - 8 oz.	1

♦ Please note plant-back restrictions

** If needed to control volunteer glyphosate-tolerant corn

Boundary® will result in effective waterhemp control and grass control. It will struggle on the large-seeded broadleaf weeds such as cocklebur, morningglory, and velvetleaf when compared to the pre-emergence in options one and two. Since Boundary's residual value is not as great as Fierce® XLT, an in-season residual becomes even more crucial. Just like in option one, we will see the same positive and negatives with Warrant® Ultra.

Individual results may vary. Always read and follow label directions.

NON-GMO

THREE-PASS SYSTEM RECOMMENDATIONS

OPTION 1

Timing	Rate/Acre	SOA #
Spring Early Burndown		
Roundup PowerMAX®	32 oz.	9
2,4-D (LV6)♦	22 oz.	4
Pre-emergence		
Authority® MTZ	12 - 16 oz.	5,14
Gramoxone® SL 2.0	40 oz.	22
COC	1%	
Post-emergence*		
Flexstar®■	18 - 25 oz.	14
Clethodim (2 lb. ai./gal.)	4 - 8 oz.	1

♦ Please note plant-back restrictions

■ Use is dependent on geography

* Add 0.125 oz. Harmony® SG if lambsquarter is present.

The burndown in this option will result in excellent control and will be very cost effective. Authority® MTZ grass control will be less effective, but will result in excellent waterhemp and marestail control. Gramoxone® SL 2.0 will provide excellent control of weeds less than 6 in. tall. Similar to other herbicide programs that contain fomesafen, the post-emergence control of waterhemp from Flexstar® will be poor if the waterhemp population is resistant.

Individual results may vary. Always read and follow label directions.

OPTION 2

Timing	Rate/Acre	SOA #
Spring Early Burndown		
Sharpen® ♦	1.5 oz.	14
2,4-D (LV6)♦	11 oz.	4
Roundup PowerMAX®	32 oz.	9
MSO	1%	
Pre-emergence		
Authority® XL	6.5 - 8 oz.	2,14
Gramoxone® SL 2.0	40 oz.	22
COC	1%	
Post-emergence*		
Ultra Blazer®	24 oz.	14
Clethodim (2 lb. ai./gal.)	4 - 8 oz.	1

♦ Please note plant-back restrictions

* Add 0.125 oz. Harmony® SG if lambsquarter is present.

Though the burndown in option two will be more costly compared to option one, option two will have greater control. Authority® XL will result in excellent, small-seeded broadleaf weed control such as waterhemp. However, Authority XL's large-seeded broadleaf weed control of cocklebur, morningglory, and velvetleaf will be slightly better than Authority MTZ. For the post-emergence application, Ultra Blazer® is another contact herbicide option for waterhemp that could be used instead of other PPOs.

Individual results may vary. Always read and follow label directions.

NON-GMO

TWO-PASS SYSTEM RECOMMENDATIONS

OPTION 1

Timing	Rate/Acre	SOA #
Pre-emergence		
Valor® XLT	3 oz.	2,14
Roundup PowerMAX®	32 oz.	9
Metribuzin (75DF)***	4 oz.	5
Post-emergence*		
Cobra®	12.5 oz.	14
Warrant®	32 - 40 oz.	15
Clethodim (2 lb. ai./gal.)	4 - 8 oz.	1

* Add 0.125 oz. Harmony® SG if lambsquarter is present.

*** Caution on high pH soils

A mixture of metribuzin plus Valor® XLT will result in excellent broadleaf control but weaker grass control. Therefore, clethodim will be needed in the post-emergence application to control grasses that have escaped. For the post-emergence application, Warrant® will provide an in-season residual barrier, reducing new flushes of waterhemp and grasses. Cobra® can be used to control emerged waterhemp, but some populations may be resistant.

Individual results may vary. Always read and follow label directions.

OPTION 2

Timing	Rate/Acre	SOA #
Pre-emergence		
2,4-D (LV6) [♦]	11 oz.	4
Authority [®] MTZ	12 - 16 oz.	5,14
Gramoxone [®] SL 2.0	40 oz.	22
COC	1%	
Post-emergence		
Prefix [®]	32 oz.	14,15
Clethodim (2 lb. ai./gal.)	4 - 8 oz.	1

[♦] Please note plant-back restrictions

Authority[®] MTZ will result in effective control of waterhemp and marestail, but will be less effective on grasses and large-seeded broadleaf weeds such as cocklebur, morningglory, and velvetleaf. In the post-emergence application, Prefix[®] contains fomesafen and, just like with other fomesafen-containing products, the post-emergence activity on some waterhemp populations may be limited. Prefix also contains Dual II Magnum[®] which will provide an in-season residual, reducing new flushes of waterhemp and other weeds.

OPTION 3

Timing	Rate/Acre	SOA #
Pre-emergence		
Gramoxone [®] SL 2.0	40 oz.	22
Authority [®] First	4 oz.	2,14
Boundary [®]	32 oz.	5,15
COC	1%	
Post-emergence		
Flexstar [®] [▪]	18 - 24 oz.	14
Warrant [®]	32 - 40 oz.	15
Clethodim (2 lb. ai./gal.)	4 - 8 oz.	1

[▪] Use is dependent on geography

Boundary[®] will have excellent waterhemp, marestail and grass control, but will struggle on large-seeded broadleaf weeds. However, the addition of Authority[®] First will help increase the efficacy against large-seeded broadleaf weeds. In the post-emergence application, the success of Flexstar[®] post-emergence activity will depend on if the population is resistant. Just like in option one, Warrant[®] can be used to prevent new flushes of weeds from emerging.

Individual results may vary. Always read and follow label directions.

BURNDOWN

FALL SYSTEM RECOMMENDATIONS

For both corn or soybeans

OPTION 1

Timing	Rate/Acre	SOA #
2,4-D (LV6)	22 - 32 oz.	4
Roundup PowerMAX®	32 oz.	9

Option one is a very cheap and effective burndown option. Roundup PowerMAX® is very effective on many winter annuals such as field pennycress, shepherd's purse, annual bluegrass and henbit. However, winter annuals such as marestail can be resistant to glyphosate. The addition of 2,4-D will result in effective control of glyphosate-resistant marestail. Having 2,4-D tank mixed with Roundup PowerMAX will increase the efficacy of other winter annual broadleaf weeds that are susceptible to glyphosate.

OPTION 2

Timing	Rate/Acre	SOA #
Brash® or Weedmaster®	32 oz.	4
Roundup PowerMAX®	32 oz.	9

Just like in option one, Roundup PowerMAX® will not be able to control glyphosate-resistant marestail. Therefore, another effective SOA is crucial for control. Option two, has both 2,4-D and dicamba which are both very effective on glyphosate-resistant marestail. A 2,4-D and dicamba combination is very effective on other winter annual broadleaf weeds such as field pennycress, shepherd's purse and henbit.

Individual results may vary. Always read and follow label directions.

OPTION 3**

Timing	Rate/Acre	SOA #
Brash® or Weedmaster®	32 oz.	4
Metribuzin (75DF)	6 oz.	5

**Will NOT control the “winter grasses”

In this option, 2,4-D, as well as dicamba, will be very effective on winter annual broadleaf weeds such as field pennycress, shepherd’s purse and henbit as well as glyphosate-resistant marestalk. However, option three has two effective SOAs on glyphosate-resistant marestalk instead of one. The addition of metribuzin will result in post-emergence and residual activity. This can be crucial if soil temperatures warm up in the fall after the application, reducing the number of new flushes of weeds in the fall. If annual bluegrass is a problem add Roundup PowerMAX®, or use options one or two.

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Roundup Ready 2 Xtend® soybeans contains genes that confer tolerance to glyphosate and dicamba. Glyphosate will kill crops that are not tolerant to glyphosate. Dicamba will kill crops that are not tolerant to dicamba. Contact your Monsanto dealer or refer to Monsanto’s Technology Use Guide for recommended weed control programs.

Seeds containing the LibertyLink® trait may be protected under one or more U.S. patents and may be planted only to produce one (1) commercial crop in a single season, and only after signing a BASF Grower Technology Agreement. It is illegal to save seeds containing the LibertyLink trait for use as planting seed or for transfer to others for use as planting seed.

LibertyLink® GT27™ soybeans offer triple stack tolerance to Liberty, glyphosate, and, pending EPA approval, the first HPPD based herbicide for soybeans. LibertyLink GT27 is not tolerant to all HPPD herbicides. HPPD herbicides currently on the market are prohibited for use with LibertyLink GT27 soybeans and may result in significant crop injury.

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Individual results may vary. Always read and follow label directions.

APPLICATION & TIMING CUTOFFS

	HERBICIDE	CUTOFF
BASED ON GROWTH STAGE	Anthem®, Charger Max®, Dual II Magnum®, Prefix®, Zidua®/SC	Up to third trifoliolate
	Outlook®	Up to fifth trifoliolate
	Extreme® ⁴ , Fusion®, Varisto™	Prior to bloom
	Liberty® 280SL ¹	Prior to bloom
	Engenia®	Up to and including bloom (R1 growth stage) for dicamba tolerant soybeans
	Enlist Duo®/Enlist One™	Up to R2 growth stage — Enlist tolerant soybeans only
	FirstRate®	Prior to R2 (full flower) growth stage
	Cadet®	VE to full flowering, or 60 day pre-harvest interval
	Glyphosate ^{2,4} , Marvel™	Up through full flowering or bloom
	Warrant®/Warrant® Ultra	After soybeans have emerged and before R2
Basagran®	Up to harvest	

BASED ON DAYS BEFORE HARVEST	Scepter®, Charger Basic®, Dual Magnum®, Sequence®	Up to 90 days before harvest
	Assure®	Up to 80 days before harvest
	Poast®	Up to 75 days before harvest
	Synchrony® XP	VE for STS/BOLT or first trifoliolate for non-STs/BOLT, then up to 60 days before harvest
	Classic®, Harmony® SG	After first trifoliolate and up to 60 days before harvest
	Resource®, Section® Three/Select® 2 EC/Cleanse®, Fusilade® DX	Up to 60 days before harvest
	Avalanche® Ultra	Up to 50 days before harvest
	Cobra®, Flexstar® GT 3.5 ⁴ , Flexstar®/Reflex®/Agent™ 1.88	Up to 45 days before harvest
	Basagran®	30 days before harvest

	HERBICIDE	CUTOFF
BASED ON MULTIPLE FACTORS	Pursuit®, Raptor®	Before weeds are 3 in. and prior to bloom ⁵
	2,4-D DB 200/Butyrac® 200 ³	Directed spray from 8 in. up to 60 days before harvest ³
	Phoenix®	Up to 45 days before harvest but not after R6
	Aim®	Apply to mature crop and when grain is starting to dry down. Pre-harvest interval 3 days.
	Gramoxone® SL/SL 2.0	Apply when at least 65% of pods are mature brown or seed moisture is ≤ 30% for indeterminate varieties. Apply when plants are mature, 50% of leaves dropped, and the rest are yellow for determinate soybeans. For both, do not apply within 15 days of harvest.
	Sharpen®	> 65% brown pods and > 70% leaf drop or when seed moisture is 30% or less
	Glyphosate ²	Apply after all pods are set and have lost green color. Do not apply within 7 to 14 ² days of harvest.
	Sterling Blue®/Clarifier®/Clarity®	Apply after pods are mature, brown and ≥ 75% leaf drop. Pre-harvest interval 14 days.

¹ LibertyLink® soybeans only.

² Cornerstone®/Tomahawk® brands, Roundup PowerMax®/PowerMax® II/WeatherMax®, Touchdown®, Durango® DMA/Duramax®. Harvest interval is 7 or 14 days depending on formulation and if soybeans are Roundup Ready or conventional.

³ Broadcast in southern states from 7 to 10 days before bloom up to mid-bloom.

⁴ Roundup Ready® soybeans only.

⁵ Or up to 85 days pre-harvest interval for Pursuit®.

PLANT-BACK RESTRICTIONS

The table below contains herbicide trade and common names, and their labeled plant-back restrictions.

Designations for time periods are as follows:

- I** = crops can be planted immediately
- D** = the number of days for crop replant interval
- M** = the number of months
- FY** = crops can be planted the following year
- FS** = the following season

Brand names are subject to change; always read and follow label instructions.

Herbicide	Cotton	Field Corn	Grain Sorghum	Soybeans	Wheat
Accent®/Zest™	10M	I	10-18M ¹	15D	4M
Atrazine ⁴	FY	I	I	FY ⁵	FY
Authority® Elite	12-18M ⁶	10M	10M	I	4.5M
Authority® MTZ/XL <small>Authority XL = pH Dependant</small>	12-18M ⁶	10M ⁶	10M ⁶	I	4M
Basagran®	I	I	I	I	I
Bicep II Magnum®	FY	I	I ⁸	FY	15M
Boundary®	12M	8M	12M	I	4.5M
Callisto®	10M	I	I	10M	4M
Canopy® DF	10M ⁶	9M ⁶	10M ⁶	I	4M
Capreno™ ¹¹	10M ⁹	I	10M ⁹	10M ⁹	4M
Clarity®	21D ¹²	I	15D	14D ¹²	22D
Classic®	8M	8M	9M	I	3M
Clethodim/Select	I	30D	30D	I	30D
Cobra®	I	I	I	I	I
Corvus®	10M ⁹	I	17M ¹⁰	9M ⁹	4M
Dual Magnum®	I	I	I ⁸	I	4.5M
Engenia® ²⁶	21-42D	I	14-28D ^{21,30}	I	120D
Enlist Duo®	30D ²⁷	7-14D ^{21,27}	7D ³⁰	30D ²⁷	7D
Envive® ⁶	10M	10M	12M	I	4M
FeXapan™ ²⁸	22-120D ^{21,28}	22-120D ²¹	22-120D ²¹	22-120D ^{21,28}	22-120D ²¹
Fierce®	45D	30D	12M	I	1-2M

Herbicide	Cotton	Field Corn	Grain Sorghum	Soybeans	Wheat
Fierce® XLT ³¹	18M	10M	18M	I	4M
FirstRate™	9M	9M	9M	I	4M
Flexstar®	I	10M	10M	I	4M
Glyphosate	I	I	I	I	I
Gramoxone® SL	I	I	I	I	I
Grandstand®	4M	4M	4M	4M	4M
Halex® GT	10M	I	I	10M	4M
Leadoff®	30D ⁶	I	10M	30D ⁶	3M
Lexar® EZ	FS	I	FS	FS	FS
Liberty®	I	I	180D	I	70D
PowerFlex® HL	90D	9M	90D	90D	1M
Prefix®	1M	10M	10M	I	4.5M
RealM® Q	10M	I	10M	10M	4M
Reflex®	I	10M	10M	I	4M
Select Max®	I	30D	30D	I	30D
Sencor®	8M	4M	18M	I	4M
Sharpen®	1.5-3M ²¹	I	I	0-30D ²¹	I
Sonic® / Authority® First	12-18M ²²	10M	12M	I	4M
Spartan®	18M	10M	10M ²³	I	4M
Ultra Blazer®	100D	100D	100D	I	40D
Valor®	30D ⁶	30D ⁶	30D ⁶	I	30D ⁶
Valor® XLT ³¹	10M	10M	10M	I	4M
Verdict®	1.5-4M ²¹	I	I ⁸	0-4M ²¹	4M
Warrant®	I	I	I	I	4M
Xtendimax® ²⁸	21D	14-28D ²¹	15D	14-28D ²¹	22-45D ²¹
Zidua®	0-4M ²¹	I	6-12M ²¹	I ²⁶	0-6M ²¹
Zidua® Pro	18M	8.5M	18M	0-1M	4M
2,4-D ²⁹	28D	7D ³⁰	7D	14D	7D

Source: Tom Barber, Professor - Weed Science, Jason Norsworthy, Professor - Weed Science
University of Arkansas System Division of Agriculture Weed Science Program

Plant-Back Restriction Footnotes on Next Page.

Plant-Back Restriction Footnotes

- ¹ Grain sorghum may be planted 10 months after application on soils with pH 7.5 or less. If soil pH is greater than 7.5, do not plant grain sorghum less than 18 months after application.
- ³ 3.25 oz. use rate, 12 months for 6.5 oz./A., 18 months for 9.75 oz./A.
- ⁴ If applied after June 10, do not rotate to any crop other than corn or grain sorghum the year following application or injury may occur.
- ⁵ Injury may occur to soybeans planted in soils with a calcareous surface layer.
- ⁶ Time interval increases with the increase of rate and soil pH level.
- ⁸ Replant only with Concept-treated or screen-treated seed.
- ⁹ Needs 15 in. cumulative precipitation from application to planting rotational crop.
- ¹⁰ Needs 30 in. cumulative precipitation from application to planting rotational crop.
- ¹¹ Increase rotational interval for grain sorghum to 18 months if pH is 7.5 or greater or if Capreno[®] rate exceeds 3 oz./A.
- ¹² Time interval is based on 8 oz./A. application rate and does not begin until 1 in. of rainfall is received.
- ¹⁴ If 4 oz./A. or less used and 1 in. of rainfall/irrigation received after application.
- ¹⁵ Conduct a field bioassay prior to planting these crops.
- ¹⁶ STS soybeans can be planted immediately.
- ¹⁷ As fallow bed treatment. Prior to planting, treated fallow beds should be thoroughly tilled (incorporated) to a depth of at least 2.5 in.
- ¹⁹ Rotation interval for soybeans is 2 months where pH is less than 7.5.
- ²⁰ If less than 15 in. of rainfall received since application, extend replant intervals to 18 months.
- ²¹ Rotation intervals increase with higher application rates.
- ²² 18 months for cotton if rate is greater than 5 oz./A. and pH >7.2.
- ²³ Rotation to grain sorghum is 18 months when Spartan is applied at 8 oz./A.
- ²⁴ Rotation to cotton and grain sorghum is 18 months when Spartan[®] Charge is applied at 10.2 fl oz./A.
- ²⁵ 10 months for 1 oz./A., 12 months for 2 oz./A., 18 months for 3 oz./A. and 24 months for 4 oz./A.
- ²⁶ 4 month rotation to soybeans if 4 oz./A. rate is used.
- ²⁷ Enlist[™] corn, cotton and soybeans can be planted immediately.
- ²⁸ Roundup Ready 2 Xtend[®] soybean and cotton can be planted immediately.
- ²⁹ Most 2,4-D labels state rotation to all crops after 90 days or sufficiently dissipated.
- ³⁰ Days listed are based on university data and after receiving 1 in. of rainfall.
- ³¹ For the Midwest region.



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