

# TABLE 2A – Weed Response to Soil-Applied Herbicides in Soybean\*

Soil Applied	SITE OF ACTION	SOYBEAN TOLERANCE**	ANNUAL BROADLEAVES													ANNUAL GRASSES								PERENNIALS			
			COCKLEBUR	JIMSONWEED	LAMBSQUARTERS	NIGHTSHADE (E. BLACK)	PALMER AMARANTH	PIGWEEED	RAGWEED (COMMON)	RAGWEED (GIANT)	SMARTWEED	VELVETLEAF	WATERHEMP	WILD MUSTARD	HORSEWEED (MARESTAIL) c	BARNYARDGRASS	CRABGRASS	GIANT FOXTAIL	GREEN FOXTAIL	YELLOW FOXTAIL	FALL PANICUM	WITCHGRASS	SANDBUR	BINDWEED (FIELD & HEDGE)	CANADA THISTLE	QUACKGRASS	YELLOW NUTSEDGE
COMMAND 3ME	13	1	F	F	G	P	P	P	G	P	G	F	P	P	-	G	F	F	F	G	G	G	F	N	N	N	N
DUAL MAGNUM, OTHERS	15	1	N	N	P	F	F/G	G	P	N	P	N	G	P	P	F	F	F	F	F	G	G	P	N	N	N	F
FIRSTRATE	2	2	G	G	G	P	N <sup>b</sup>	F	F	G	F	G	N <sup>b</sup>	F	G	F	F	F	F	F	P	P	N	N	N	P	
LOROX/LINEX	5	2	P	P	G	F	P	G	G	F	G	F	P	G	P	F	F	F	F	F	F	P	N	N	N	N	
METRIBUZIN	5	2	F	F	G	N	F	F	G	F	F	G	F	F	G	P	F	G	G	F	F	P	N	N	N	N	
OUTLOOK	15	1	N	N	P	G	F	G	P	N	P	N	F	P	N	F	F	F	F	F	G	G	N	N	N	F	
PROWL H2O/PROWL	3	2	N	N	G	P	P	F	P	N	P	F	P	P	P	G	G	G	G	G	G	G	N	N	N	N	
PURSUIT	2	1	F	F	G	F	N <sup>b</sup>	F	F	F	G	G	N <sup>b</sup>	F	P	F	F	G	G	P	P	P	P	N	N	F	
PYTHON	2	1	F	F	F	G	N <sup>b</sup>	F	F	F	G	G	N <sup>b</sup>	F	G	P	F	P	P	P	P	P	N	N	N	N	
SONALAN (PPI ONLY)	3	1	N	N	G	F	F	G	P	N	P	N	F	P	-	F	F	F	F	F	F	F	N	N	N	N	
SPARTAN	14	2	P	P	F	F	G	F	P	F	F	F	G	P	F	N	N	P	P	P	N	N	N	N	N	G	
TRIFLURALIN (PPI ONLY)	3	1	N	N	G	F	F	G	P	N	P	N	F	P	-	F	F	F	F	F	F	F	N	N	N	N	
VALOR/ VALOR EZ	14	2	P	F	G	G	G	G	F	F	F	F	G	G	G	N	N	P	P	P	N	N	N	N	N	P	
WARRANT	15	1	P	N	F	G	F/G	G	F	N	P	P	G	P	P	F	F	F	F	F	F	F	N	N	N	F	
ZIDUA	15	1	P	F	F	G	G	F	N	F	F	F	G	F	P	F	F	F	F	F	F	F	N	N	N	F	
<b>Premixes</b>																											
AFFORIA	2/2/14	2	P	F	G	G	G	G	F	F	F	F	G	G	G	N	N	P	P	P	N	N	N	N	N	N	P
ANTHEM FLEX	14/15	1	P	F	F	G	G	F	N	F	F	F	G	F	P	F	F	F	F	F	F	F	N	N	N	F	
ANTHEM MAXX	14/15	1	P	F	F	G	G	F	N	F	F	F	G	F	P	F	F	F	F	F	F	F	N	N	N	F	
AUTHORITY ASSIST	2/14	2	F	F	F	F	G	F	F	F	G	G	G	F	F	F	F	F	F	P	P	P	P	N	N	G	
AUTHORITY EDGE	14/15	2	P	F	F	F	G	F	P	F	F	F	G	F	F	F	F	F	F	F	F	F	N	N	N	G	
AUTHORITY ELITE/BROADAXE XC	14/15	2	P	P	F	F	G	F	P	F	F	F	G	P	F	F	F	F	G	G	G	P	N	N	N	G	
AUTHORITY FIRST/SONIC	2/14	2	G	G	G	G	G	F	F	G	G	G	G	F	G	F	F	F	F	F	P	P	N	N	N	G	
AUTHORITY MAXX	2/14	2	P	F	F	F	G	F	P	G	G	G	G	G	G	P	P	F	P	P	P	P	N	N	N	G	
AUTHORITY MTZ	5/14	2	F	F	F	F	G	F	F	F	G	G	F	F	G	F	F	F	P	P	F	P	N	N	N	F	
AUTHORITY SUPREME	14/15	2	P	F	F	F	G	F	P	F	F	F	G	F	F	F	F	F	F	F	F	F	N	N	N	G	
AUTHORITY XL	2/14	2	F	F	F	G	G	F	G	F	G	G	G	F	G	F	F	F	F	F	P	P	P	N	N	F	
BOUNDARY	5/15	2	F	F	G	F	F/G	G	F	F	G	G	F	F	G	F	F	F	F	F	G	G	N	N	N	F	
CANOPY	2/5	2	G	G	F	N	P	F	G	G	F	G	P	F	G	F	F	F	F	F	F	P	P	N	N	P	
CANOPY EX <sup>a</sup>	2/2	1	G	G	G	N	N <sup>b</sup>	G	G	F	G	G	N <sup>b</sup>	F	G	P	F	F	F	P	P	P	P	N	N	P	
DIMETRIC CHARGED	5/14	2	F	F	G	G	G	F	F	F	F	G	F	F	G	F	F	F	F	F	F	P	N	N	N	P	
ENVIVE	2/2/14	2	G	G	F	G	G	F	F	F	F	G	F	F	G	F	F	F	F	F	F	P	P	N	N	F	
FIERCE EZ	14/15	3	P	F	G	G	G/E	G	F	F	F	G/E	G	F	F	F	F	F	F	F	F	F	N	N	N	F	
FIERCE MTZ/KYBER	5/14/15	3	F	F	G	G	F	F	F	F	F	G	F	F	G	F	F	F	F	F	F	F	N	N	N	G	
FIERCE XLT	2/14/15	3	G	G	F	G	G/E	G	F	F	F	G/E	G	F	F	F	F	F	F	F	F	F	P	N	N	F	
FLEXSTAR GT 3.5	9/14	2	P	P	G	F	P	F	G	F	G	P	P	F	F	N	N	N	N	N	N	N	N	N	N	N	
MOCCASIN MTZ	5/15	2	F	F	G	F	F/G	G	F	F	F	G	F	F	G	F	F	F	F	F	G	G	N	N	N	F	
OPTILL	2/14	1	F	F	G	F	P	F	F	F	G	G	P	F	F	F	F	G	G	P	P	P	P	N	N	F	
PREFIX	14/15	2	P	P	G	F	G	F	F	F	G	P	G	F	F	F	F	F	F	F	G	G	N	N	N	P	
SPARTAN CHARGE	14/14	2	P	P	F	F	G	F	P	F	F	F	G	P	F	N	N	P	P	P	N	N	N	N	N	F	
SURVEIL	2/14	2	G	G	G	G	G	F	F	F	G	F	G	F	F	F	F	F	F	F	P	P	N	N	N	P	
SYNCHRONY XP	2/2	2	G	G	F	N	N <sup>b</sup>	F	G	F	F	G	N <sup>b</sup>	F	G	F	F	F	F	F	F	P	P	N	N	F	
TRIPZIN ZC	3/5	2	F	F	G	P	F	F	G	F	F	G	F	F	G	F	F	F	F	F	F	F	N	N	N	N	
TRIVENCE	2/5/14	2	G	G	F	G	G	F	G	F	F	G	F	F	G	F	F	F	F	F	F	P	P	N	N	P	

(Continued on next page)

**TABLE 2A – Weed Response to Soil-Applied Herbicides in Soybean\* (continued)**

Soil Applied	SITE OF ACTION	SOYBEAN TOLERANCE**	ANNUAL BROADLEAVES													ANNUAL GRASSES								PERENNIALS			
			COCKLEBUR	JIMSONWEED	LAMBSQUARTERS	NIGHTSHADE (E. BLACK)	PALMER AMARANTH	PIGWEED	RAGWEED (COMMON)	RAGWEED (GIANT)	SMARTWEED	VELVETLEAF	WATERHEMP	WILD MUSTARD	HORSEWEED (MARESTAIL) <sup>c</sup>	BARNYARDGRASS	CRABGRASS	GIANT FOXTAIL	GREEN FOXTAIL	YELLOW FOXTAIL	FALL PANICUM	WITCHGRASS	SANDBUR	BINDWEED (FIELD & HEDGE)	CANADA THISTLE	QUACKGRASS	YELLOW NUTSEDGE
VALOR XLT	2/14	2	<b>G</b>	<b>G</b>	<b>E</b>	<b>G</b>	<b>G</b>	<b>E</b>	<b>G</b>	F	<b>E</b>	<b>G</b>	<b>G</b>	<b>E</b>	<b>G</b>	F	F	F	F	F	F	F	P	P	N	N	F
VERDICT	14/15	1	P	P	P	P	P	P	P	P	P	P	P	F	P	P	P	P	P	P	P	N	N	N	N	N	
WARRANT ULTRA	14/15	2	P	P	<b>G</b>	<b>E</b>	<b>G</b>	<b>E</b>	<b>G</b>	F	<b>G</b>	P	<b>G</b>	<b>E</b>	F	<b>E</b>	<b>E</b>	<b>E</b>	<b>E</b>	<b>E</b>	<b>E</b>	F	N	N	N	F	
ZIDUA PRO	2/14/15	2	F	F	<b>G</b>	<b>E</b>	<b>G</b>	<b>E</b>	F	F	<b>G</b>	<b>G</b>	<b>G</b>	F	<b>E</b>	<b>E</b>	<b>E</b>	<b>E</b>	<b>E</b>	<b>E</b>	<b>G</b>	P	N	N	F		
ZONE DEFENSE	14/14	2	P	F	<b>E</b>	<b>E</b>	<b>G</b>	<b>E</b>	<b>G</b>	F	F	F	<b>G</b>	<b>G</b>	<b>G</b>	N	N	P	P	P	N	N	N	N	N	N	F

Herbicide Site of Action: The site of action key is located on pages 15-16. Herbicide Effectiveness: P=Poor; F=Fair; **G**=Good; **E**=Excellent; N=None; – = Not enough information to rank

\* The above ratings are a relative comparison of herbicide effectiveness. Weather conditions greatly influence the herbicide's effectiveness, and weed control may be better under favorable conditions or poorer under unfavorable conditions.

\*\* Crop Tolerance: 1=Minimal risk of crop injury; 2=Crop injury can occur under certain conditions (cold, wet); 3=Severe crop injury can occur. Follow precautions under Remarks and Limitations and on the label; 4=Risk of severe crop injury is high.

<sup>a</sup> For more information on *Canopy EX* applications consult Table 2Q – Weed Management in No-Till Soybean.

<sup>b</sup> Almost all populations of Palmer amaranth and waterhemp found in Michigan are resistant to the ALS-inhibiting herbicides (Group 2). Refer to the factsheet on “Keys to Managing Multiple-Resistant Palmer amaranth” on pages 221-225

<sup>c</sup> Most horseweed populations in Michigan are resistant to ALS-inhibiting herbicides (Group 2), glyphosate (Group 9), or both herbicide site of action groups. Herbicides that have these site of action groups will not control these resistant horseweed populations. Refer to the “Controlling Horseweed” factsheet on page 226-229.

# TABLE 2B – Weed Response to Postemergence Herbicides in Soybean\*

<b>Postemergence</b>	SITE OF ACTION	SOYBEAN TOLERANCE**	ANNUAL BROADLEAVES												ANNUAL GRASSES							PERENNIALS																	
			COCKLEBUR	JIMSONWEED	LAMBSQUARTERS	NIGHTSHADE (E. BLACK)	PALMER AMARANTH	PIGWEED	RAGWEED (COMMON)	RAGWEED (GIANT)	SMARTWEED	VELVETLEAF	WATERHEMP	WILD MUSTARD	HORSEWEED (MARESTAIL)	BARNYARDGRASS	CRABGRASS	GIANT FOXTAIL	GREEN FOXTAIL	YELLOW FOXTAIL	FALL PANICUM	WITCHGRASS	SANDBUR	BINDWEED (FIELD & HEDGE)	CANADA THISTLE	QUACKGRASS	YELLOW NUTSEDGE												
ANTHEM MAXX	14/15	2	P	G	F	G	P	G	P	P	P	F	P	P	P	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
ASSURE II/TARGA	1	1	N	N	N	N	N	N	N	N	N	N	N	N	N	G	G	F	F	G	F	F	F	N	N	N	N	F	N	N	N	N	N	N	N	N			
BASAGRAN	6	2	F	G	G	P	N	P	F	F	F	F	G	N	F	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N			
CADET	14	2	P	G	F	F	P	G	P	P	P	F	P	P	P	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N			
CLASSIC	2	2	F	G	N	N	N <sup>a</sup>	F	G	G	F	G	N <sup>a</sup>	F	G <sup>c</sup>	N	N	P	P	P	N	N	N	N	N	N	N	N	F	N	N	N	N	N	N	F			
COBRA	14	3	G	G	P	G	G	F	F	F	P	F	G	F	P	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N			
FIRSTRATE	2	1	F	F	N	N	N	P	F	F	F	G	N	G	G <sup>c</sup>	N	N	N	N	N	N	N	N	N	N	N	N	P	F	N	N	N	N	N	N	F			
FLEXSTAR	14	2	F	G	F	G	G	F	F	F	F	G	F	G	F	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N			
FUSILADE DX	1	1	N	N	N	N	N	N	N	N	N	N	N	N	N	F	G	F	F	F	F	F	F	F	F	F	N	N	N	N	N	N	N	N	N	G	N		
HARMONY SG	2	3	F	F	G	N	N <sup>a</sup>	F	P	P	F	G	N <sup>a</sup>	F	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
MARVEL	14/14	3	F	F	F	G	F	F	G	F	F	F	F	F	P	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
PERPETUO	14/15	2	P	P	F	P	P	P	P	P	P	F	P	P	P	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
POAST/POAST PLUS	1	1	N	N	N	N	N	N	N	N	N	N	N	N	N	F	G	F	F	F	F	F	F	F	F	F	N	N	N	N	N	N	N	N	N	F	N		
PREFIX	14/15	2	P	F	P	G	G	F	G	G	P	P	G	F	P	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
PURSUIT	2	2	F	F	P	F	N <sup>a</sup>	F	F	G	G	G	N <sup>a</sup>	G	P	F	F	G	G	G	F	F	P	P	N	N	P	P	N	N	N	N	N	N	N	N	F		
RAPTOR	2	2	G	G	G	F	N <sup>a</sup>	F	F	G	G	G	N <sup>a</sup>	F	-	F	F	F	G	G	F	F	N	N	N	N	P	F	N	N	N	N	N	N	N	P			
REFLEX	14	1	P	F	P	G	G	F	G	G	P	P	G	F	P	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
RESOURCE	14	2	P	P	F	P	P	P	P	P	P	F	P	P	P	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
SELECT MAX/ ARROW/SELECT	1	1	N	N	N	N	N	N	N	N	N	N	N	N	N	F	G	F	F	F	F	F	F	F	F	N	N	N	N	N	N	N	N	N	N	N	G	N	
SYNCHRONY XP	2/2	2	F	G	G	N	N <sup>a</sup>	F	G	G	F	G	N <sup>a</sup>	F	G <sup>c</sup>	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	G	
ULTRA BLAZER	14	2	F	G	P	G	F	F	F	F	G	P	G	F	P	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
VARISTO	2/6	2	F	G	G	F	N <sup>a</sup>	F	F	F	G	G	N <sup>a</sup>	F	N	P	P	F	P	P	P	P	P	P	N	N	N	N	N	N	N	N	N	N	N	N	N	F	
WARRANT ULTRA	14/15	2	P	F	P	G	G	F	G	G	P	P	G	F	P	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
<b>GLYPHOSATE-RESISTANT (RR/GT)</b>																																							
GLYPHOSATE	9	1	F	F	G	G	N <sup>b</sup>	F	G	G	G	G	N <sup>b</sup>	G	N <sup>c</sup>	F	F	F	F	F	F	F	F	F	F	F	N	N	N	N	N	N	N	N	N	N	F		
EXTREME	2/9	2	F	F	G	F	N <sup>b</sup>	F	G	G	G	G	N <sup>b</sup>	G	N <sup>c</sup>	G	G	F	F	F	G	G	G	N	N	N	N	N	N	N	N	N	N	N	N	N	N	F	
FLEXSTAR GT 3.5	9/14	2	F	F	G	F	G	F	F	F	G	G	G	N <sup>c</sup>	F	F	F	F	F	F	F	F	F	F	N	N	N	N	N	N	N	N	N	N	N	N	N	F	
SEQUENCE	9/15	2	F	F	G	G	N <sup>b</sup>	F	G	G	G	G	N <sup>b</sup>	G	N <sup>c</sup>	F	F	F	F	F	F	F	F	F	N	N	N	N	N	N	N	N	N	N	N	N	N	N	F
WARRANT + GLYPHOSATE	9/15	2	F	F	G	G	N <sup>b</sup>	F	G	G	G	G	N <sup>b</sup>	G	N <sup>c</sup>	F	F	F	F	F	F	F	F	F	N	N	N	N	N	N	N	N	N	N	N	N	N	N	F
<b>GLUFOSINATE-RESISTANT (LL)</b>																																							
LIBERTY, OTHERS	10	1	F	F	G	G	G	G	F	G	G	G	G	E	G/E	F	G	G	G	F	G	F	F	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
CHEETAH MAX	10/14	2	F	F	G	G	G	F	F	F	G	G	G	F	G	F	G	G	G	F	G	F	F	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
<b>ENLIST E3 SOYBEAN ONLY</b>																																							
ENLIST ONE	4	1	G	F	G	G	G	G	G	G	P	F	G	G	G	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
ENLIST DUO	4/9	1	F	F	G	G	G	F	F	F	G	G	G	F	G	F	F	F	F	F	F	F	F	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
<b>RR2 XTEND and XTENDFLEX ONLY</b>																																							
ENGENIA	4	1	G	G	G	G	G	G	F	F	F	G	G	G/E	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
XTENDIMAX	4	1	G	G	G	G	G	G	F	F	F	G	G	G/E	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
TAVIUM	4/15	1	G	G	G	G	G	G	F	F	F	G	G	G/E	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

(Continued on next page)

## TABLE 2B – Weed Response to Postemergence Herbicides in Soybean\* (continued)

Herbicide Site of Action: The site of action key is located on pages 15-16.

Herbicide Effectiveness: P = Poor; F = Fair; **G** = Good; **E** = Excellent; N = None; – = Not enough information to rank

\* *The above ratings are a relative comparison of herbicide effectiveness. Weather conditions greatly influence the herbicide's effectiveness, and weed control may be better under favorable conditions or poorer under unfavorable conditions.*

\*\* Crop Tolerance: 1=Minimal risk of crop injury; 2=Crop injury can occur under certain conditions (cold, wet); 3=Severe crop injury can occur. Follow precautions under Remarks and Limitations and on the label; 4=Risk of severe crop injury is high.

<sup>a</sup> Almost all populations of Palmer amaranth and waterhemp found in Michigan are resistant to the ALS-inhibiting herbicides (Group 2). Refer to the factsheet on "Keys to Managing Multiple-Resistant Palmer amaranth" on pages 221-225.

<sup>b</sup> Most populations of Palmer amaranth and waterhemp found in Michigan are resistant to glyphosate (Group 9). Refer to the factsheet on "Keys to Managing Multiple-Resistant Palmer amaranth" on pages 221-225.

<sup>c</sup> Most horseweed populations in Michigan are resistant to ALS-inhibiting herbicides (Group 2), glyphosate (Group 9), or both herbicide site of action groups. Herbicides that have these site of action groups will not control these resistant horseweed populations. Refer to the "Controlling Horseweed" factsheet on page 226-229.

## TABLE 2C – Herbicide Premixes in Soybean

TRADE NAME	COMPANY	FORMULATION	TYPICAL USE RATE <sup>a</sup>	=	EQUIVALENT RATES
Afforia	Corteva	50.8WG	2.5 oz/A	=	0.25 oz Harmony SG + 0.25 oz Express + 2 oz Valor
Anthem Flex	FMC	4L	4.5 oz/A	=	0.6 oz Aim + 4 oz Zidua SC
Anthem MAXX	FMC	4.3SE	4 oz/A	=	0.6 oz Cadet + 3.92 oz Zidua SC
Authority Assist	FMC	4L	10 oz/A	=	8.3 oz Spartan + 3.34 oz Pursuit L
Authority Edge	FMC	4.25L	9 oz/A	=	6.1 oz Spartan + 3.25 oz Zidua SC
Authority Elite/BroadAxe XC	FMC/Syngenta	7L	32 oz/A	=	5.6 oz Spartan + 1.65 pt Dual Magnum
Authority First/Sonic	FMC/Corteva	70DF	6.4 oz/A	=	8 oz Spartan + 0.6 oz FirstRate
Authority MAXX	FMC	66WG	5 oz/A	=	6.2 oz Spartan + 0.8 oz Classic
Authority MTZ	FMC	45DF	16 oz/A	=	5.76 oz Spartan + 5.76 oz Metribuzin
Authority Supreme	FMC	4.16SC	8 oz/A	=	4 oz Spartan + 4 oz Zidua SC
Authority XL	FMC	70WG	4 oz/A	=	5 oz Spartan + 1.25 oz Classic
Autumn Super	Bayer	51WG	0.5 oz/A	=	0.0019 lb ai iodosulfuron + 0.014 lb ai thiencazabone-methyl
Boundary 6.5EC	Syngenta	6.5EC	2 pt/A	=	1.33 pt Dual Magnum + 6.67 oz Metribuzin
Canopy	Corteva	75WG	4.5 oz/A	=	1.92 oz Classic + 3.86 oz Metribuzin
Canopy EX	Corteva	29.5WG	2.2 oz/A	=	2 oz Classic + 0.3 oz Express SG
Cheetah Max	NuFarm Inc	3L	1 qt/A	=	1 pt Reflex + 27 oz Cheetah
Dimetric Charged	Winfield Solutions	3.67L	12 oz/A	=	6 oz Metribuzin + 2 oz Valor
Enlist Duo <sup>b</sup>	Corteva	3.33L	4.75 pt/A	=	32 oz Enlist One + 1 lb a.e. glyphosate
Envive <sup>c</sup>	Corteva	41.3WG	3.5 oz/A	=	2 oz Valor + 1.28 oz Classic + 0.192 oz Harmony SG
Extreme	BASF	2.17L	3 pt/A	=	0.56 lb a.e. glyphosate + 4 oz Pursuit L
Fierce EZ	Valent	3.04L	6 oz/A	=	2 oz Valor + 2.5 oz Zidua SC
Fierce MTZ/Kyber	Valent/Coteva	2.64L	1 pt/A	=	2 oz Valor + 4 oz Metribuzin + 2.5 oz Zidua SC
Fierce XLT	Valent	62.41WG	4 oz/A	=	1 oz Classic + 2 oz Valor + 2.5 oz Zidua SC

(Continued on next page)

## TABLE 2C – Herbicide Premixes in Soybean (continued)

TRADE NAME	COMPANY	FORMULATION	TYPICAL USE RATE <sup>a</sup>	=	EQUIVALENT RATES
Flexstar GT 3.5	Syngenta	2.82L	3.5 pt/A	=	0.99 lb a.e. glyphosate + 1 pt Flexstar
Marvel	FMC	3L	7.25 oz/A	=	0.9 oz Cadet + 11 oz Flexstar
Moccasin MTZ	United Phosphorus, Inc.	4.5L	2.5 pt/A	=	1 pt Moccasin 8EC + 7.44 oz Metribuzin
OpTill	BASF	68WG	2 oz/A	=	1 oz Sharpen + 4 oz Pursuit L
Panoflex	FMC	50WG	0.3 oz/A	=	0.24 oz Express + 0.06 oz Harmony SG
Perpetuo	Valent	2.3L	6 oz/A	=	4.12 oz Resource + 2.46 oz Zidua SC
Prefix	Syngenta	5.29L	2 pt/A	=	1 pt Dual Magnum + 1 pt Reflex
Sequence	Syngenta	5.25L	2.5 pt/A	=	0.98 pt Dual Magnum + 0.7 lb a.e. glyphosate
Spartan Charge	FMC	3.5SC	8 oz/A	=	1.33 oz Aim + 6.27 oz Spartan
Surveil	Corteva	48WG	3.5 oz/A	=	2.47 oz Valor + 0.5 oz FirstRate
Synchrony XP	Corteva	28.4WG	0.75 oz/A	=	0.64 oz Classic + 0.105 oz Harmony SG
Tavium <sup>d</sup>	Syngenta	3.4L	56.5 oz/A	=	22 oz XtendiMax + 1 pt Dual Magnum
Tripzin ZC	United Phosphorus, Inc.	4L	42 oz/A	=	2.3 pt Prowl + 7.7 oz Metribuzin
Trivence <sup>e</sup>	Corteva	61.3WG	8 oz/A	=	1.28 oz Classic + 4.75 oz Metribuzin + 2 oz Valor
Valor XLT	Valent	40.3WG	4 oz/A	=	1.65 oz Classic + 2.34 oz Valor
Varisto	BASF	4.18L	21 oz/A	=	4 oz Raptor + 16.8 oz Basagran 5L
Verdict	BASF	5.57L	5 oz/A	=	1 oz Sharpen + 4.2 oz Outlook
Warrant Ultra	Bayer	3.45CS	50 oz/A	=	3 pt Warrant + 1 pt Reflex
Zidua PRO	BASF	4.09SC	6 oz/A	=	4 oz Pursuit + 1 oz Sharpen + 3.2 oz Zidua SC
Zone Defense	Helm	77.2WG	5 oz/A	=	6.2 oz Spartan + 1.47 oz Valor

<sup>a</sup> Typical use rates recommended are for medium textured soils with 3% organic matter. Lower rates can be used in planned preemergence followed by postemergence programs in glufosinate or glyphosate-resistant soybeans. These rates can be found in the Remarks and Limitations section for each herbicide.

<sup>b</sup> Only use in Enlist E3 soybean.

<sup>c</sup> DO NOT apply more than 2.5 oz/A of *Envive* if you are located north of I-96 or have a composite pH between 7.1 and 7.6.

<sup>d</sup> Only use in Roundup Ready 2 Xtend or XtendFlex soybean.

<sup>e</sup> DO NOT apply more than 6 oz/A of *Trivence* if you are located north of State Road 46 or have a composite soil pH between 7.1 and 7.6.

## TABLE 2D – Soybean Herbicides – Remarks and Limitations

### Soybean – Preplant Incorporated Only

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
Annual grasses	trifluralin ( <i>many</i> )	0.75	1.5 pt 4EC	<ul style="list-style-type: none"> <li>Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>Incorporate in top 2 or 3 inches of soil within 24 hr. after application.</li> <li>On sandy and sandy loam soils low in organic matter, use 0.5 lb a.i./A (1 pt/A).</li> <li>Most effective control if application is made 10 days to 2 weeks ahead of planting and field is reworked just prior to planting.</li> <li>Sugar beets may be planted 12 months after application. Moldboard plowing to a depth of 12 inches is recommended to reduce the risk of crop injury.</li> <li>Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	ethalfluralin ( <i>Sonalan HFP</i> )	0.9	2.5 pt 3EC	<ul style="list-style-type: none"> <li>Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>Incorporate in top 2 or 3 inches of soil within 2 days of application.</li> <li>Sugar beets may be planted 8 months after application only if the <i>Sonalan</i> is applied at 3 pt/A or less and the treated soil is moldboard-plowed to a depth of 12 inches.</li> <li>Refer to label and Table 12 for crop rotation restrictions.</li> </ul>

### Soybean – Soil Applied – All Tillage Systems

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
Annual grasses	s-metolachlor ( <i>Dual Magnum</i> , <i>EverpreX</i> )	1.27	1.33 pt 7.62EC	<ul style="list-style-type: none"> <li><b>May be applied preplant, preplant incorporated or preemergence.</b></li> <li>Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>Rates should be increased to 1.66 pt/A for effective nutsedge control.</li> <li>Nutsedge control is improved when s-metolachlor is incorporated.</li> <li>DO NOT exceed 3.7 lbs. a.i./A of s-metolachlor per season, and 3 applications per year.</li> <li>May be applied postemergence on soybeans, but this application will not control emerged weeds. If applied postemergence, the maximum use rate of a single application of <i>Dual Magnum</i> or <i>Dual II Magnum</i> is 2 pt/A, and there is a 75 day preharvest interval. Soybean should not be used for forage or hay.</li> <li>Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	OR		OR	
	( <i>Dual II Magnum</i> , <i>Cinch</i> )		1.33 pt 7.64EC	
OR	( <i>Moccasin</i> )		OR	
			1.3 pt 8EC	

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## Soybean – Soil Applied – All Tillage Systems (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
Annual grasses	dimethenamid-P ( <i>Outlook</i> )	0.84	18 oz 6EC	<ul style="list-style-type: none"> <li>• <b>May be applied preplant, preplant incorporated or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• <i>Outlook</i> rate should be increased to 21 oz/A for effective nutsedge control.</li> <li>• Nutsedge control is improved when <i>Outlook</i> is incorporated.</li> <li>• <i>Outlook</i> rates vary with soil texture and organic matter.</li> <li>• <i>Outlook</i> may be applied early postemergence on soybeans from the first to fifth trifoliolate, but this application will not control emerged weeds.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	metolachlor ( <i>Parallel</i> ) OR ( <i>Parallel PCS</i> )	1.3	1.33 pt 7.8L OR 1.33 pt 8.0L	<ul style="list-style-type: none"> <li>• <b>May be applied preplant, preplant incorporated or preemergence.</b></li> <li>• <i>Parallel/Parallel PCS</i> is a mix of the R and S-isomers of metolachlor. Limited research has shown that 1.33 pt/A of these products provide similar activity to s-metolachlor products at 1.33 pt/A. However, <i>Parallel/Parallel PCS</i> may not provide the consistency, length of control or performance on more difficult to control weeds. Rates would need to be increased to 2.0 pt/A to provide the same amount of s-metolachlor (the more active isomer) in the 1.33 pt/A rate of <i>Dual Magnum</i> (s-metolachlor).</li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	pendimethalin ( <i>Prowl</i> ) OR ( <i>Prowl H<sub>2</sub>O</i> )	1  0.95	2.4 pt 3.3EC OR 2.0 pt 3.8SC	<ul style="list-style-type: none"> <li>• <b>May be applied preplant, preplant incorporated or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• Preemergence applications may be made up to 2 days after planting.</li> <li>• DO NOT apply after soybean cracking or emergence.</li> <li>• Applications close to or after planting may result in soybean injury, including stem swelling and brittleness. Early preplant or preplant incorporated applications reduce the risk of injury.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>

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## Soybean – Soil Applied – All Tillage Systems (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
<b>Annual grasses</b>	saflufenacil + dimethenamid-P <i>(Verdict)</i>	0.22	5 oz 5.57L	<ul style="list-style-type: none"> <li>• <b>May be applied preplant or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• The 5 oz/A application rate of <i>Verdict</i> labeled for use in soybean will not provide much residual weed control. This product is best used as part of a burndown program in no-till soybean (see Table 2Q).</li> <li>• For additional residual control and enhanced burndown activity, higher rates of <i>Verdict</i> can be applied. However, longer intervals are required between <i>Verdict</i> application and soybean planting; a minimum of 14 days for 7.5 oz/A and 30 days for 10 oz/A of <i>Verdict</i>.</li> <li>• DO NOT apply after soybean emergence or severe crop injury will occur.</li> <li>• DO NOT apply within 30 days of planting if an at-plant organophosphate or carbamate insecticide is planned or severe injury will occur.</li> <li>• DO NOT apply to coarse textured soils with less than 2% organic matter, unless soybean is planted 30 days after application.</li> <li>• DO NOT tank-mix or apply <i>Verdict</i> within 30 days of soil-applied applications of flumioxazin (<i>Valor</i>), sulfentrazone (<i>Authority</i> or <i>Spartan</i>), or fomesafen (<i>Reflex</i>, <i>Flexstar</i>) containing products. However, fomesafen (<i>Flexstar</i>, <i>Reflex</i>) and other POST PPO-inhibiting herbicides can be used 14 days after soybean emergence.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	acetochlor <i>(Warrant)</i>	1.125	3 pt 3CS	<ul style="list-style-type: none"> <li>• <b>May be applied preplant or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• Crop injury may result when soil conditions are cold and wet, or waterlogged.</li> <li>• <i>Warrant</i> can be applied postemergence up to R2 soybean; this application will not control emerged weeds.</li> <li>• DO NOT apply more than 4 qt/A of <i>Warrant</i> per season.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>

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## Soybean – Soil Applied – All Tillage Systems (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
<b>Annual grasses</b>	pyroxasulfone ( <i>Zidua SC</i> )	0.133	4 oz 4.17SC	<ul style="list-style-type: none"> <li>• <b>May be applied preplant, preplant incorporated or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• Application rate varies with soil texture and application timing.</li> <li>• DO NOT apply more than 3.5 oz/A on coarse textured; 5 oz/A on medium textured soil; or 5.75 oz/A fine textured soils of <i>Zidua SC</i>.</li> <li>• DO NOT use on peat or muck soils with 10% or more organic matter.</li> <li>• May be applied postemergence from emergence to the sixth trifoliolate leaf stage (V6). This application will not control emerged weeds.</li> <li>• The maximum cumulative amount of <i>Zidua SC</i> that can be applied per cropping season is 3.5 oz/A on coarse textured or 5.75 oz/A on all other soils.</li> <li>• Rotation restrictions are dependent on use rate. If <i>Zidua SC</i> is applied at the corn only rate of 6.5 oz/A the rotation restrictions are extended to 4 months for soybean, 6 months for wheat, and 18 months for other small grains. Refer to Table 12 for crop rotation restrictions.</li> </ul>
<b>Annual broadleaves</b>	thifensulfuron + tribenuron + flumioxazin ( <i>Afforia</i> )	0.08	2.5 oz 50.8WG	<ul style="list-style-type: none"> <li>• <b>Apply preplant or preemergence; depending on <i>Afforia</i> rate.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• <i>Afforia</i> at 2.5 oz/A can be applied preemergence up to 3 days after planting, but prior to soybean emergence; at rates greater than 2.5 to 3.75 oz/A 7 days is needed prior to planting.</li> <li>• Crop injury may occur from applications made to poorly drained soils under cool, wet conditions.</li> <li>• DO NOT tank mix or apply with metolachlor (<i>Dual</i>), dimethenamid (<i>Outlook</i>), or acetochlor (<i>Warrant</i>) products within 14 days of planting, unless soybeans are planted under no-till or minimum tillage conditions on wheat stubble or no-till field corn stubble or crop injury will occur.</li> <li>• Refer to label and Table 12 for crop rotation restrictions. Rotation restrictions under reduced tillage systems are the longer of the two listed in Table 12.</li> </ul>

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## Soybean – Soil Applied – All Tillage Systems (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
<b>Annual broadleaves</b>	pyroxasulfone + carfentrazone <i>(Anthem Flex)</i>	0.14	4.5 oz 4SC	<ul style="list-style-type: none"> <li>• <b>May be applied preplant, preplant incorporated or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• Application rates vary by soil type and organic matter. <i>Anthem Flex</i> rates range from 2.25 to 6.4 oz/A (4.5 oz/A).</li> <li>• <i>Anthem Flex</i> should be used as part of a planned preemergence followed by postemergence herbicide program.</li> <li>• Ensure that the seed furrow is closed over the seed and seed are planted at least 1 inch deep to avoid risk of soybean injury.</li> <li>• DO NOT apply after soybean emergence – severe injury or death may occur.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	pyroxasulfone + fluthiacet <i>(Anthem MAXX)</i>	0.134	4 oz 4.3SE	<ul style="list-style-type: none"> <li>• <b>May be applied preplant, preplant incorporated or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• Application rates vary by soil type and organic matter. <i>Anthem MAXX</i> rates range from 2.5 to 5.5 oz/A (4 oz/A).</li> <li>• <i>Anthem MAXX</i> should be used as part of a planned pre-emergence followed by postemergence herbicide program.</li> <li>• May be applied postemergence. Refer to the postemergence application section for <i>Anthem MAXX</i>.</li> <li>• Refer to Table 12 for crop rotation restrictions.</li> </ul>
	sulfentrazone + imazethapyr <i>(Authority Assist)</i>	0.312	10 oz 4L	<ul style="list-style-type: none"> <li>• <b>May be applied preplant, preplant incorporated or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• <i>Authority Assist</i> use rates are based on soil texture, organic matter, and pH. <i>Authority Assist</i> rates range from 6 to 12 oz/A (10 oz/A). Reduced rates ranging from 4 to 6 oz/A (5 oz/A) can be applied as part of a 2-pass program in glufosinate or glyphosate-resistant soybean, unless resistant weeds are present.</li> <li>• DO NOT apply more than 3 days after planting — soybean injury may occur.</li> <li>• DO NOT apply to sands with less than 1% organic matter.</li> <li>• Soybean stunting may occur if excessive rainfall occurs after application but before soybean emergence, especially at higher rates.</li> <li>• Soybean varieties vary in their tolerance to sulfentrazone. Consult your local seed dealer for more information.</li> <li>• Tank mixtures or sequential herbicide programs are needed to increase the spectrum of weed control.</li> <li>• Forty months and a successful bioassay are required prior to planting sugar beets, cucumbers and tomatoes.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>

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## Soybean – Soil Applied – All Tillage Systems (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
<b>Annual broadleaves</b>	sulfentrazone + cloransulam-methyl <i>(Authority First/Sonic)</i>	0.26	6.4 oz 70DF	<ul style="list-style-type: none"> <li>• <b>May be applied preplant, preplant incorporated or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• Apply <i>Authority First/Sonic</i> at 6.4 oz/A. Reduced rates ranging from 3.2 to 6 oz/A (4 oz/A) can be applied as part of a 2-pass program in glufosinate or glyphosate-resistant soybean, unless resistant weeds are present.</li> <li>• DO NOT apply after soybean emergence or death or severe injury may occur.</li> <li>• DO NOT apply to sands with less than 1% organic matter.</li> <li>• Soybean stunting may occur if excessive rainfall occurs after application but before soybean emergence.</li> <li>• Soybean varieties vary in their tolerance to sulfentrazone. Consult your local seed dealer for more information.</li> <li>• Tank mixtures or sequential herbicide programs can be used to improve the weed control spectrum.</li> <li>• Rotation to sugar beets, cucumbers, and tomatoes requires 30 months and a successful bioassay.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	sulfentrazone + chlorimuron <i>(Authority MAXX)</i>	0.206	5 oz 66WG	<ul style="list-style-type: none"> <li>• <b>May be applied preplant, preplant incorporated or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• Apply <i>Authority MAXX</i> at 5 oz/A as part of a 2-pass program. Higher rates lengthen the crop rotation restrictions.</li> <li>• DO NOT apply to cracking or emerged soybean – severe injury will occur.</li> <li>• DO NOT apply to soils with pH greater than 7.6.</li> <li>• Soybean stunting may occur if excessive rainfall occurs after application but before soybean emergence.</li> <li>• Soybean varieties vary in their tolerance to sulfentrazone. Consult your local seed dealer for more information.</li> <li>• DO NOT tank-mix or follow with another chlorimuron containing product in the same season.</li> <li>• Tank mixtures or sequential herbicide programs are needed to increase the spectrum of weed control.</li> <li>• Soil pH strongly affects crop rotation. Corn can be planted 10 months after <i>Authority MAXX</i> application if the soil pH is ≤6.8. Refer to Table 12 for crop rotation restrictions.</li> </ul>

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## Soybean – Soil Applied – All Tillage Systems (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
<b>Annual broadleaves</b>	sulfentrazone + metribuzin <i>(Authority MTZ)</i>	0.45	16 oz 45DF	<ul style="list-style-type: none"> <li>• <b>May be applied preplant, preplant incorporated or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• <i>Authority MTZ</i> use rates are based on soil texture, organic matter, and pH. <i>Authority MTZ</i> rates range from 12 to 20 oz/A (16 oz/A). Reduced rates ranging from 8 to 14 oz/A (12 oz/A) can be applied as part of a 2-pass program in glufosinate or glyphosate-resistant soybean, unless resistant weeds are present.</li> <li>• DO NOT apply <i>Authority MTZ</i> at rates greater than 12 oz/A if the soil pH is greater than 7.5.</li> <li>• DO NOT apply after soybean emergence or death or severe injury may occur.</li> <li>• DO NOT apply to sands with less than 1% organic matter.</li> <li>• Soybean varieties vary in their tolerance to sulfentrazone and metribuzin. Consult your local seed dealer for more information.</li> <li>• Tank mixtures or sequential herbicide programs are needed to increase the spectrum of weed control.</li> <li>• Corn may be replanted 4 months after <i>Authority MTZ</i> if the application rate is less than 14 oz/A.</li> <li>• The rotation interval to sugarbeets is 24 months if a successful bioassay is completed.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	sulfentrazone + chlorimuron-ethyl <i>(Authority XL)</i>	0.175	4 oz 70WG	<ul style="list-style-type: none"> <li>• <b>May be applied preplant, preplant incorporated or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• Apply <i>Authority XL</i> at 3 to 5 oz/A as part of a 2-pass program.</li> <li>• DO NOT apply more than 3 days after planting as soybean injury may occur.</li> <li>• DO NOT apply to soils with pH greater than 7.6.</li> <li>• Soybean stunting may occur if excessive rainfall occurs after application but before soybean emergence, especially at higher rates.</li> <li>• Soybean varieties vary in their tolerance to sulfentrazone. Consult your local seed dealer for more information.</li> <li>• DO NOT tank-mix or apply within 14 days of an organophosphate insecticide.</li> <li>• Tank mixtures or sequential herbicide programs are needed to increase the spectrum of weed control.</li> <li>• Soil pH strongly affects crop rotation restrictions. Rotation restrictions are lengthened to 18 months for all crops, except small grains and those with rotation restrictions of 36 months, if the soil pH is greater than 6.8. Refer to label and Table 12 for additional crop rotation restrictions.</li> </ul>

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## Soybean – Soil Applied – All Tillage Systems (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
<b>Annual broadleaves</b>	chlorimuron-ethyl + metribuzin <i>(Canopy)</i>	0.21	4.5 oz 75WG	<ul style="list-style-type: none"> <li>• <b>May be applied preplant, preplant incorporated or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• <i>Canopy</i> use rates are based on soil texture, organic matter, and pH. <i>Canopy</i> rates range from 4 to 7 oz/A (4.5 oz/A). Reduced rates ranging from 2.25 to 4 oz/A (3 oz/A) can be applied as part of a 2-pass program in glufosinate or glyphosate-resistant soybean, unless resistant weeds are present.</li> <li>• DO NOT apply <i>Canopy</i> at rates greater than 2.25 oz/A to soils with a composite pH greater than 7.0; use of higher rates may result in unacceptable injury to this year's crop and the following crop.</li> <li>• DO NOT apply <i>Canopy</i> to soils with a composite pH exceeding 7.6.</li> <li>• Tank mixtures or sequential herbicide programs are needed to increase the spectrum of weed control.</li> <li>• Tomatoes may be transplanted 10 months after <i>Canopy</i> application.</li> <li>• Rotation intervals are dependent on soil pH and rate. Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	metribuzin + flumioxazin <i>(Dimetric Charged)</i>	0.34	12 oz 3.67L	<ul style="list-style-type: none"> <li>• <b>May be applied preplant or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• <i>Dimetric Charged</i> use rates are based on soil texture, organic matter, and pH. Use rates are 12 oz/A for coarse textured soils or calcareous soils; 15 to 18 oz/A for medium textured soils; and 18 oz/A for fine textured soils. For soils with pH of 7.5 or higher use a maximum of 12 oz/A.</li> <li>• DO NOT apply on coarse soils with less than 2% organic matter or soils with less than 1% organic matter.</li> <li>• Crop injury may occur from applications made to poorly drained soils, under cool, wet conditions.</li> <li>• DO NOT apply after soybean emergence – severe injury or death may occur.</li> <li>• Some soybean varieties are sensitive to flumioxazin and metribuzin. Consult your local seed dealer for information.</li> <li>• DO NOT tank mix or apply with metolachlor (<i>Dual</i>), dimethenamid (<i>Outlook</i>), or acetochlor (<i>Warrant</i>) products within 14 days of planting, unless soybeans are planted under no-till or minimum tillage conditions on wheat stubble or no-till field corn stubble or crop injury will occur.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>

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## Soybean – Soil Applied – All Tillage Systems (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
Annual broadleaves	flumioxazin + chlorimuron-ethyl + thifensulfuron-methyl <i>(Envive)</i>	0.09	3.5 oz 41.3WG	<ul style="list-style-type: none"> <li>• <b>May be applied preplant or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• <i>Envive</i> use rates range between 2.5 and 5.3 oz/A for portions of Michigan south of highway I-96. The maximum use rate of <i>Envive</i> for portions of the Michigan north of I-96 is 2.5 oz/A.</li> <li>• DO NOT apply <i>Envive</i> at rates greater than 2.5 oz/A to soils with a composite pH between 7.1 and 7.6.</li> <li>• DO NOT apply to soils with a composite pH exceeding 7.6.</li> <li>• DO NOT apply after soybean emergence or death or severe injury may occur.</li> <li>• DO NOT tank mix with Group 15 herbicides such as metolachlor (<i>Dual</i>), dimethenamid (<i>Outlook</i>) or acetochlor (<i>Warrant</i>) products within 14 days of planting, unless soybeans are planted under no-till or minimum till conditions on wheat stubble or no-till field corn stubble.</li> <li>• <i>Envive</i> can be tank mixed with pendimethalin (<i>Prowl</i>) for annual grass control.</li> <li>• Tomatoes may be transplanted 12 months after <i>Envive</i> application.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	cloransulam-methyl <i>(FirstRate)</i>	0.031	0.6 oz 84WG	<ul style="list-style-type: none"> <li>• <b>May be applied preplant, preplant incorporated or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• Excellent common and giant ragweed control.</li> <li>• Product rate depends on soil organic matter. If soil organic matter is greater than 3.0%, <i>FirstRate</i> can be applied at 0.75 oz/A.</li> <li>• The cumulative application rate may not exceed 1.05 oz/A per season.</li> <li>• Tank mixtures or prepackaged herbicide mixes are needed for eastern black nightshade and annual grass control.</li> <li>• <i>FirstRate</i> will not control ALS-resistant weed species.</li> <li>• Thirty months and a successful bioassay are required prior to planting sugar beets, cucumbers, and tomatoes.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	linuron <i>(Lorox DF)</i> OR <i>(Linex)</i>	0.75	1.5 lb 50DF OR 1.5 pt 4L	<ul style="list-style-type: none"> <li>• <b>May be applied preplant or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings</li> <li>• If heavy rainfall occurs soon after application, injury to the crop may result.</li> <li>• DO NOT use on coarse-textured sandy or sandy loam soils or on soils with less than 1% organic matter.</li> <li>• Plant soybeans at least 1.75 inches deep.</li> <li>• Tank mixtures or sequential herbicide programs are needed to increase the spectrum of weed control.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>

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## Soybean – Soil Applied – All Tillage Systems (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
Annual broadleaves	metribuzin ( <i>Metribuzin, others</i> )	0.375	8 oz 75DF	<ul style="list-style-type: none"> <li>• <b>May be applied preplant, preplant incorporated or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• <i>Metribuzin</i> use rates are dependent on soil texture, organic matter, and pH. A lower rate of 5.33 oz/A can be applied in tank mixtures or as part of a 2-pass program in glufosinate or glyphosate-resistant soybean.</li> <li>• DO NOT use if soil pH is greater than 7.5, or if soil organic matter is less than 0.5%, or on coarse textured soils with less than 2% organic matter.</li> <li>• Some soybean varieties have low tolerance to metribuzin and should not be planted. Consult product labels, MSUE or agribusiness for a listing of varieties.</li> <li>• Tank mixtures or prepackaged herbicide mixes are needed for eastern black nightshade and annual grass control.</li> <li>• <i>Metribuzin</i> will not control triazine-resistant weed species.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	saflufenacil + imazethapyr ( <i>OpTill</i> )	0.085	2 oz 68WG	<ul style="list-style-type: none"> <li>• <b>May be applied preplant or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• DO NOT apply after soybean emergence or severe crop injury will occur.</li> <li>• Tank mixtures with organophosphate or carbamate insecticides can cause temporary injury.</li> <li>• DO NOT apply to coarse-textured soils with less than 2% organic matter unless soybean is planted 1 month after application.</li> <li>• DO NOT tank mix or apply <i>OpTill</i> within 30 days of products containing flumioxazin (<i>Valor</i>), sulfentrazone (<i>Authority</i> or <i>Spartan</i>) or fomesafen (<i>Reflex</i>).</li> <li>• DO NOT tank mix with products containing clomazone (<i>Command</i>).</li> <li>• Tank mixtures or sequential herbicide programs are needed to increase the spectrum of weed control.</li> <li>• Applying a full rate of products containing chlorimuron, chloransulam, flumetsulam, imazaquin or imazethapyr the same year as <i>OpTill</i> may increase the risk of injury to sensitive follow crops.</li> <li>• Forty months and a successful bioassay are required before planting sugar beets, cucumbers and tomatoes.</li> <li>• Refer to label and Table 12 for additional crop rotation restrictions.</li> </ul>
	imazethapyr ( <i>Pursuit</i> )	0.063	4 oz 2L	<ul style="list-style-type: none"> <li>• <b>May be applied preplant, preplant incorporated or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• Common ragweed may only be suppressed; tank mixtures or a sequential herbicide program is needed to improve ragweed control.</li> <li>• <i>Pursuit</i> will not control ALS-resistant weed species.</li> <li>• <i>Pursuit</i> is very persistent and can limit rotational crops.</li> <li>• Forty months and a successful bioassay are required prior to planting sugar beets, cucumbers, and tomatoes.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>

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## Soybean – Soil Applied – All Tillage Systems (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
<b>Annual broadleaves</b>	flumetsulam ( <i>Python</i> )	0.057	1.14 oz 80WG	<ul style="list-style-type: none"> <li>• <b>May be applied preplant, preplant incorporated or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• Adjust application rate according to soil type and organic matter.</li> <li>• DO NOT apply to areas where soil pH is greater than 7.8 or to soils with greater than 5% organic matter and pH less than 5.9.</li> <li>• Tank mixtures or sequential herbicide programs are needed to improve control of ragweed, cocklebur and jimsonweed.</li> <li>• <i>Python</i> will not control ALS-resistant weed species.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	sulfentrazone ( <i>Spartan</i> )	0.25	8 oz 4L	<ul style="list-style-type: none"> <li>• <b>May be applied preplant, preplant incorporated or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• <i>Spartan</i> use rates are based on soil texture, organic matter, and pH. <i>Spartan</i> rates range from 4.5 to 12 oz/A (8 oz/A). Reduced rates of 4.5 to 6 oz/A can be applied as part of a 2-pass program in glufosinate or glyphosate-resistant soybean, unless resistant weeds are present.</li> <li>• Apply within 3 days of planting. DO NOT apply after soybean cracking or emergence — severe injury or death may occur.</li> <li>• Soybean stunting may occur if excessive rainfall occurs after application but before soybeans emerge.</li> <li>• Some soybean varieties are sensitive to sulfentrazone. Consult your local seed dealer for information.</li> <li>• DO NOT apply to soils with pH of 7.5 or greater or on sands with less than 1% organic matter.</li> <li>• Tank mixtures or sequential herbicide programs can be used to improve the weed control spectrum.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	carfentrazone + sulfentrazone ( <i>Spartan Charge</i> )	0.22	8 oz 3.5SC	<ul style="list-style-type: none"> <li>• <b>May be applied preplant, preplant incorporated or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• <i>Spartan Charge</i> use rates are based on soil texture, organic matter, and pH. <i>Spartan Charge</i> rates range from 5.75 to 8.5 oz/A (8 oz/A). A reduced rate of 6 oz/A can be applied as part of a 2-pass program in glufosinate or glyphosate-resistant soybean, unless resistant weeds are present.</li> <li>• This product is best used as part of burndown program in no-till soybean (see Table 2Q).</li> <li>• DO NOT apply after soybean cracking or emergence – severe injury or death may occur.</li> <li>• DO NOT apply to soils with pH of 7.5 or greater or on sands with less than 1% organic matter.</li> <li>• Soybean stunting may occur if excessive rainfall occurs after application but before soybean emergence.</li> <li>• Some soybean varieties are sensitive to sulfentrazone. Consult your local seed dealer for information.</li> <li>• Tank mixtures or sequential herbicide programs can be used to improve the weed control spectrum.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>

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## Soybean – Soil Applied – All Tillage Systems (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
Annual broadleaves	flumioxazin + cloransulam-methyl <i>(Surveil)</i>	0.105	3.5 oz 48WG	<ul style="list-style-type: none"> <li>• <b>May be applied preplant or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• <i>Surveil</i> use rates range from 2.1-4.2 oz/A. A lower rate of 2.8 oz/A can be applied as part of a 2-pass program in glufosinate or glyphosate-resistant soybean, unless resistant weeds are present.</li> <li>• Apply within 3 days of planting. DO NOT apply after soybean cracking or emergence – severe injury or stand reduction may occur.</li> <li>• Sequential herbicide programs are needed to increase the spectrum of weed control and for season-long control.</li> <li>• Crop injury may occur when applied to poorly drained soils and/or under cool, wet conditions.</li> <li>• DO NOT tank mix with Group 15 herbicides such as metolachlor (<i>Dual</i>), dimethenamid (<i>Outlook</i>), acetochlor (<i>Warrant</i>), or pyroxasulfone (<i>Zidua</i>) products within 14 days of planting, unless soybeans are planted under no-till or minimum till conditions on wheat stubble or no-till field corn stubble.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	chlorimuron-ethyl + thifensulfuron-methyl <i>(Synchrony XP)</i>	0.027	1.5 oz 28.4WG	<ul style="list-style-type: none"> <li>• <b>May be applied preplant, preplant incorporated or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• <i>Synchrony XP</i> use rates range between 1 and 3 oz/A; use a minimum of 1.25 oz/A for residual control or suppression of labeled weeds.</li> <li>• DO NOT apply <i>Synchrony XP</i> at rates greater than 1 oz/A to soils with a composite pH between 7.1 and 7.6; use of higher rates may result in unacceptable injury to the following crop.</li> <li>• DO NOT apply to soils with a composite pH exceeding 7.6.</li> <li>• Tank mixtures or sequential herbicide programs are needed to increase the spectrum of weed control.</li> <li>• <i>Synchrony XP</i> will not control ALS-resistant weed species.</li> <li>• Rotation intervals are dependent on soil pH and rate. Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	chlorimuron + flumioxazin + metribuzin <i>(Trivence)</i>	0.31	8 oz 61.3WG	<ul style="list-style-type: none"> <li>• <b>May be applied preplant or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• <i>Trivence</i> use rates range between 6 and 8 oz/A for portions of Michigan south of State Road 46. The maximum use rate of <i>Trivence</i> for portions north of State Road 46 is 6 oz/A.</li> <li>• If soil pH is greater than 7, do not exceed 6 oz/A of <i>Trivence</i>.</li> <li>• DO NOT use <i>Trivence</i> if soil pH exceeds 7.6.</li> <li>• Crop injury may occur from applications made to poorly drained soils under cool, wet conditions.</li> <li>• DO NOT apply after soybean emergence or death or severe injury may occur.</li> <li>• DO NOT tank mix or apply with metolachlor (<i>Dual</i>), dimethenamid (<i>Outlook</i>) or acetochlor (<i>Warrant</i>) products within 14 days of planting, unless soybeans are planted under no-till or minimum tillage conditions on wheat stubble or no-till field corn stubble or crop injury will occur.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>

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## Soybean – Soil Applied – All Tillage Systems (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
<b>Annual broadleaves</b>	flumioxazin ( <i>Valor</i> ) OR ( <i>Valor EZ</i> )	0.08	2.5 oz 51WG OR 2.5 oz 4L	<ul style="list-style-type: none"> <li>• <b>May be applied preplant or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• <i>Valor/Valor EZ</i> use rates range from 2 to 3 oz/A (2.5 oz/A). A reduced rate of 2 oz/A can be applied as part of a 2-pass program in glufosinate or glyphosate-resistant soybean, unless resistant weeds are present.</li> <li>• Soils with high organic matter and/or high clay content may require 3 oz/A.</li> <li>• Apply within 3 days of planting. DO NOT apply after soybean cracking or emergence — severe injury or death may occur.</li> <li>• Crop injury may occur when applied to poorly drained soils and/or under cool, wet conditions.</li> <li>• DO NOT tank mix or apply with metolachlor (<i>Dual</i>), dimethenamid (<i>Outlook</i>) or acetochlor (<i>Warrant</i>) products – crop injury will occur. Under no-till or reduced till conditions these tank mixtures can be made if there is 14 days between application and planting or if there is 14 days between application of <i>Valor/Valor EZ</i> and applications of these other products.</li> <li>• Can be tank mixed with pendimethalin (<i>Prowl</i>) for annual grass control.</li> <li>• Crop rotation restrictions are dependent on rainfall, use rate and tillage.</li> <li>• Rotation restrictions for 2 oz or less are 1 month with 1 inch of rain for corn and winter wheat. Dry bean and barley may be planted after 3 months, and alfalfa, oats and sugar beets may be planted after 4 months if the ground is tilled prior to planting or 8 months if no tillage is performed.</li> <li>• Rotation restrictions for the higher use rates (3 oz or less) can be found in Table 12.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	flumioxazin + chlorimuron-ethyl ( <i>Valor XLT</i> )	0.1	4 oz 40.3WG	<ul style="list-style-type: none"> <li>• <b>May be applied preplant or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• <i>Valor XLT</i> use rates range from 3 to 5 oz/A (4 oz/A). A reduced rate of 3 oz/A can be applied as part of a 2-pass program in glufosinate or glyphosate-resistant soybean, unless resistant weeds are present.</li> <li>• DO NOT apply at rates greater than 2.5 oz/A to soils with a composite pH greater than 6.8. Weeds will only be suppressed at this rate.</li> <li>• DO NOT apply to soils with a composite pH exceeding 7.6.</li> <li>• DO NOT apply after soybean emergence or death or severe injury may occur.</li> <li>• DO NOT tank mix or apply with metolachlor (<i>Dual</i>), dimethenamid (<i>Outlook</i>) or acetochlor (<i>Warrant</i>) products – crop injury will occur. Under no-till or reduced till conditions these tank mixtures can be made if there is 14 days between application and planting or if there is 14 days between application of <i>Valor XLT</i> and applications of these other products.</li> <li>• Can be tank mixed with pendimethalin (<i>Prowl</i>) for annual grass control.</li> <li>• Tomatoes may be transplanted 12 months after <i>Valor XLT</i> application.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>

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## Soybean – Soil Applied – All Tillage Systems (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
<b>Annual broadleaves</b>	flumioxazin + sulfentrazone <i>(Zone Defense)</i>	0.24	5 oz 77.2WG	<ul style="list-style-type: none"> <li>• <b>May be applied preplant or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• <i>Zone Defense</i> use rates are based on soil texture, organic matter, and pH. Use rates range from 3.5 to 5 oz/A for course textured soils; 4.5 to 6 oz/A for medium textured soils; and 5 to 6.6 oz/A for fine textured soils. For soils with less than 2% organic matter use the lowest rate for that specific soil texture.</li> <li>• DO NOT use on coarse soils classified as sand which have less than 1% organic matter.</li> <li>• Ensure that the seed furrow is closed over the seed and seeds are planted at least 1 inch deep to avoid risk of soybean injury.</li> <li>• Apply within 3 days of soybean planting. DO NOT apply after soybean cracking or emergence – severe injury or death may occur.</li> <li>• Some soybean varieties are sensitive to sulfentrazone. Consult your local seed dealer for information.</li> <li>• DO NOT tank-mix or apply with dimethenamid (<i>Outlook</i>) or acetochlor (<i>Warrant</i>) products – crop injury will occur. Can be tank-mixed with metolachlor (<i>Dual</i>) products as long as no more than 5 oz/A of <i>Zone Defense</i> is used.</li> <li>• Tank mixtures or sequential herbicide programs are needed to increase the spectrum of weed control.</li> <li>• Refer to label and Table 12 for crop rotation restrictions. DO NOT use on soils that exceed 6.8 or unacceptable injury to the following crop may occur.</li> </ul>
<b>Annual grasses Annual broadleaves</b>	pyroxasulfone + sulfentrazone <i>(Authority Edge)</i>	0.30	9 oz 4.25SC	<ul style="list-style-type: none"> <li>• <b>May be applied preplant, preplant incorporated or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• <i>Authority Edge</i> use rates are based on soil texture, organic matter, and pH. Use rates range from 5.9 to 9.4 oz/A for course textured soils; 7 to 12 oz/A for medium textured soils; and 9 to 15.7 oz/A for fine textured soils. For soils with pH greater than 7.2 use the lowest rate for that specific soil texture and organic matter.</li> <li>• Ensure that the seed furrow is closed over the seed and seed are planted at least 1 inch deep to avoid risk of soybean injury.</li> <li>• Apply within 3 days of soybean planting. DO NOT apply after soybean cracking or emergence – severe injury or death may occur.</li> <li>• Some soybean varieties are sensitive to sulfentrazone. Consult your local seed dealer for information.</li> <li>• Tank mixtures or sequential herbicide programs are needed to increase the spectrum of weed control.</li> <li>• Refer to label and Table 12 for crop rotation restrictions. For rates higher than 9.8 oz use the longer rotation restriction listed in Table 12.</li> </ul>

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## Soybean – Soil Applied – All Tillage Systems (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
Annual grasses Annual broadleaves	s-metolachlor + sulfentrazone <i>(Authority Elite/BroadAxe XC)</i>	1.75	32 oz 7L	<ul style="list-style-type: none"> <li>• <b>May be applied preplant, preplant incorporated or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• <i>Authority Elite/BroadAxe XC</i> use rates are based on soil texture, organic matter, and pH. Use rates range from 19 to 25 oz/A for coarse textured soils; 25 to 32 oz/A for medium textured soils; and 25 to 38.7 oz/A for fine textured soils. For soils with pH greater than 7.2 use the lowest rate for that specific soil texture and organic matter.</li> <li>• DO NOT apply on soils classified as sands, which have less than 1% organic matter.</li> <li>• Apply within 3 days of soybean planting. DO NOT apply after soybean cracking or emergence – severe injury or death may occur.</li> <li>• Some soybean varieties are sensitive to sulfentrazone. Consult your local seed dealer for information.</li> <li>• Tank mixtures or sequential herbicide programs are needed to increase the spectrum of weed control.</li> <li>• <i>Authority Elite/BroadAxe XC</i> can be tank-mixed with 1 oz/A of <i>Sharpen</i> in reduced and no-till soybean if it is applied 14 days prior to planting. DO NOT apply this tank-mixture to coarse textured soils with 2% organic matter or less.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	pyroxasulfone + sulfentrazone <i>(Authority Supreme)</i>	0.26	8 oz 4.16SC	<ul style="list-style-type: none"> <li>• <b>May be applied preplant, preplant incorporated or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• <i>Authority Supreme</i> use rates are based on soil texture, organic matter, and pH. Use rates range from 6 to 6.9 oz/A for coarse textured soils; 6 to 9.8 oz/A for medium textured soils; and 7 to 11.5 oz/A for fine textured soils. For soils with pH greater than 7.2 use the lowest rate for that specific soil texture and organic matter.</li> <li>• DO NOT apply on soils classified as sands, which have less than 1% organic matter.</li> <li>• Ensure that the seed furrow is closed over the seed and seed are planted at least 1 inch deep to avoid risk of soybean injury.</li> <li>• Apply within 3 days of soybean planting. DO NOT apply after soybean cracking or emergence – severe injury or death may occur.</li> <li>• Some soybean varieties are sensitive to sulfentrazone. Consult your local seed dealer for information.</li> <li>• Tank mixtures or sequential herbicide programs are needed to increase the spectrum of weed control.</li> <li>• Refer to label and Table 12 for crop rotation restrictions. For rates higher than 9.8 oz use the longer rotation restriction listed in Table 12.</li> </ul>

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## Soybean – Soil Applied – All Tillage Systems (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
Annual grasses Annual broadleaves	s-metolachlor + metribuzin <i>(Boundary 6.5EC)</i>	1.625	2 pt 6.5EC	<ul style="list-style-type: none"> <li>• <b>May be applied preplant, preplant incorporated or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• <i>Boundary 6.5EC</i> use rates are based on soil texture, organic matter, and pH. <i>Boundary 6.5EC</i> rates range from 1.2 to 2.4 pt/A (2 pt/A). A reduced rate of 1.5 pt/A can be applied as part of a 2-pass program in glufosinate or glyphosate-resistant soybean, unless resistant weeds are present.</li> <li>• DO NOT use <i>Boundary 6.5EC</i> at rates greater than 1.5 pt/A on soils with pH above 7.</li> <li>• DO NOT use on sands or soils with less than 0.5% organic matter. DO NOT use on loamy sand soils with less than 2% organic matter.</li> <li>• Some soybean varieties have low tolerance to metribuzin and should not be planted. Consult product labels, MSUE, or agribusiness for a listing of varieties.</li> <li>• <i>Boundary</i> will provide 3-6 weeks of weed control. Increase application rate, use tank mixtures or use in a sequential herbicide program to increase the length of control.</li> <li>• DO NOT apply more than 3.7 lb ai/A of s-metolachlor per year.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	clomazone <i>(Command 3ME)</i>	0.75	2 pt 3ME	<ul style="list-style-type: none"> <li>• <b>May be applied preplant or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• Poor weed control will result if <i>Command 3ME</i> is incorporated.</li> <li>• Several ornamental, horticultural and agronomic crops are sensitive to <i>Command</i> spray drift and volatilization.</li> <li>• Precautions should be taken to avoid spray drift.</li> <li>• DO NOT apply <i>Command</i> within 1,200 ft. of housing developments, commercial fruit and vegetable production, and greenhouses.</li> <li>• DO NOT apply in winds above 10 mph or at pressures above 30 PSI.</li> <li>• <b>Special precaution:</b> A special sprayer clean-out procedure is required for <i>Command 3ME</i>. See label for specific instructions.</li> <li>• Tomatoes may be transplanted 9 months after <i>Command</i> application, but the rotation restriction for tomatoes grown from seed is 12 months.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	pyroxasulfone + flumioxazin <i>(Fierce EZ)</i>	0.1425	6 oz 3.04L	<ul style="list-style-type: none"> <li>• <b>May be applied preplant or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• Apply <i>Fierce EZ</i> at 6 to 7.5 oz/A, depending on soil type and application timing.</li> <li>• DO NOT apply after soybean cracking or emergence – severe injury or death may occur.</li> <li>• Crop injury may occur when <i>Fierce</i> is applied to poorly drained soils and/or under cool, wet conditions.</li> <li>• DO NOT tank mix or apply with metolachlor (<i>Dual</i>), dimethenamid (<i>Outlook</i>), or acetochlor (<i>Warrant</i>) products – crop injury will occur.</li> <li>• The rotation restriction for field corn is based on tillage system. Corn can be planted 7 days after application of <i>Fierce EZ</i> at 6 oz/A under reduced tillage systems. Otherwise corn can be planted 30 days after application. Refer to Table 12 for additional crop rotation restrictions.</li> </ul>

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## Soybean – Soil Applied – All Tillage Systems (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
<b>Annual grasses</b> <b>Annual broadleaves</b>	flumioxazin + metribuzin + pyroxasulfone <i>(Fierce MTZ/Kyber)</i>	0.33	1 pt 2.64L	<ul style="list-style-type: none"> <li>• <b>May be applied preplant or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• <i>Fierce MTZ /Kyber</i> can be used at 1 to 1.5 pt/A, depending on soil type and organic matter.</li> <li>• DO NOT apply on coarse soils with less than 2% organic matter or soils with less than 1% organic matter.</li> <li>• Crop injury may occur from applications made to poorly drained soils, under cool, wet conditions or when soils with a pH of 7.5 or higher.</li> <li>• DO NOT apply after soybean emergence – severe injury or death may occur.</li> <li>• Some soybean varieties are sensitive to flumioxazin and metribuzin. Consult your local seed dealer for information.</li> <li>• DO NOT tank mix or apply with metolachlor (<i>Dual</i>), dimethenamid (<i>Outlook</i>), or acetochlor (<i>Warrant</i>) products – crop injury will occur.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	chlorimuron + flumioxazin + pyroxasulfone <i>(Fierce XLT)</i>	0.16	4 oz 62.41WG	<ul style="list-style-type: none"> <li>• <b>May be applied preplant or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• Apply <i>Fierce XLT</i> at 4 oz/A as part of a 2-pass program.</li> <li>• DO NOT apply <i>Fierce XLT</i> to soils with a composite pH greater than 6.8.</li> <li>• DO NOT apply after soybean cracking or emergence – severe injury or death may occur.</li> <li>• Crop injury may occur when <i>Fierce XLT</i> is applied to poorly drained soils and/or under cool, wet conditions.</li> <li>• DO NOT tank mix or apply with metolachlor (<i>Dual</i>) or dimethenamid (<i>Outlook</i>) products – crop injury will occur.</li> <li>• Refer to Table 12 for crop rotation restrictions.</li> </ul>
	s-metolachlor + metribuzin <i>(Moccasin MTZ)</i>	1.48	42 oz 4.5L	<ul style="list-style-type: none"> <li>• <b>May be applied preplant, preplant incorporated or preemergence.</b></li> <li>• Refer to Table 2A for weed control and croptolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• <i>Moccasin MTZ</i> use rates are based on soil texture and organic matter. Use 1.75 to 2.67 pt/A on coarse and medium textured soils with soil organic matter from 0.5 to 3% and 2.67 to 3 pt/A with soil organic matter &gt;3%. On fine textured soils rates range from 3 to 3.8 pt/A for soils with organic matter from 0.5 to 3% and 3.56 to 4.56 pt/A with soil organic matter &gt;3%.</li> <li>• DO NOT use if soil pH 7.5 or greater; if organic matter is &lt;0.5%; or if soils are classified as sands; or loamy sand soils with less than 2% organic matter.</li> <li>• Plant soybean at least 1.5 inches deep.</li> <li>• Some soybean varieties are sensitive to metribuzin. Consult your local seed dealer for information.</li> <li>• <i>Moccasin MTZ</i> will provide 3-6 weeks of weed control. Tank mixtures or sequential herbicide programs are needed to increase the length and spectrum of weed control.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>

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## Soybean – Soil Applied – All Tillage Systems (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
Annual grasses Annual broadleaves	s-metolachlor + fomesafen <i>(Prefix)</i>	1.32	2 pt 5.29L	<ul style="list-style-type: none"> <li>• <b>May be applied preplant, preplant incorporated or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• <i>Prefix</i> will provide 4-5 weeks of control and/or suppression of both broadleaf and grass weeds.</li> <li>• Sequential herbicide programs are needed to increase the spectrum of weed control and for season-long control.</li> <li>• May be applied postemergence on soybeans, but there is a 90 day preharvest interval. Refer to Table 2B and the postemergence application section for more information.</li> <li>• DO NOT apply more than 0.24 lb ai/A of fomesafen (from any fomesafen containing product) (i.e., 1 pt/A of <i>Reflex</i>) to the same field in CONSECUTIVE years.</li> <li>• DO NOT apply more than 3.7 lb ai/A of s-metolachlor per year.</li> <li>• Refer to Table 12 for crop rotation restrictions.</li> </ul>
	pendimethalin + metribuzin <i>(Tripzin ZC)</i>	1.25	40 oz 4ZC	<ul style="list-style-type: none"> <li>• <b>May be applied preplant, preplant incorporated or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• <i>Tripzin ZC</i> use rates are based on soil texture, and organic matter. Use 29 oz/A on coarse textured soils; 29 to 44 oz/A on medium and fine textured soils with soil organic matter from 0.5 to 3%; and 44 oz/A on medium and 44 to 58 oz/A on fine textured soils with organic matter &gt;3%.</li> <li>• DO NOT use if soil pH 7.5 or greater, or if soils are classified as sands; or loamy sand or sandy loam soils that have less than 1% organic matter.</li> <li>• Preemergence applications may be made up to 2 days after planting.</li> <li>• Applications close to or after planting may result in soybean injury, including stem swelling and brittleness. Early preplant or preplant incorporated applications reduce the risk of injury.</li> <li>• Some soybean varieties are sensitive to metribuzin. Consult your local seed dealer for information.</li> <li>• <i>Tripzin ZC</i> will provide 3-6 weeks of weed control. Tank mixtures or sequential herbicide programs are needed to increase the length and spectrum of weed control.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	acetochlor + fomesafen <i>(Warrant Ultra)</i>	1.3	50 oz 3.45CS	<ul style="list-style-type: none"> <li>• <b>May be applied preplant or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• <i>Warrant Ultra</i> will provide 4-5 weeks of control and/or suppression of both broadleaf and/or suppression of both broadleaf and grass weeds.</li> <li>• Sequential herbicide programs are needed to increase the spectrum of weed control and for season-long control.</li> <li>• Crop injury may result when soil conditions are cold and wet, or waterlogged.</li> <li>• <i>Warrant Ultra</i> can be applied postemergence up to R2 soybean. Refer to Table 2B and the postemergence application section for more information.</li> <li>• DO NOT apply more than 3 lb ai/A of acetochlor (i.e., 4 qt/A of <i>Warrant</i>) per season.</li> <li>• DO NOT apply more than 0.24 lb ai/A of fomesafen (from any fomesafen containing product) (i.e., 1 pt/A of <i>Reflex</i>) to the same field in CONSECUTIVE years.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>

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## Soybean – Soil Applied – All Tillage Systems (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
<b>Annual grasses</b> <b>Annual broadleaves</b>	saflufenacil + imazethapyr + pyroxasulfone <i>(Zidua PRO)</i>	0.19	6 oz 4.09SC	<ul style="list-style-type: none"> <li>• <b>May be applied preplant or preemergence.</b></li> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• <i>Zidua PRO</i> can be applied at rates from 4.5 to 6 oz/A.</li> <li>• DO NOT apply on coarse textured soils with <math>\leq</math> 2% organic matter, unless soybean is planting 1 month after application.</li> <li>• DO NOT apply after soybean emergence or severe crop injury will occur.</li> <li>• DO NOT tank-mix or apply <i>Zidua PRO</i> within 30 days of flumioxazin (<i>Valor</i>), sulfentrazone (<i>Authority</i> or <i>Spartan</i>), or fomesafen (<i>Reflex</i>) containing products.</li> <li>• Applying a full rate of products containing chlorimuron, cloransulam, flumetsulam, imazaquin, or imazethapyr the same year as <i>Zidua PRO</i> may increase the risk of injury to sensitive follow crops.</li> <li>• Forty months and a successful bioassay are required prior to planting sugar beets, cucumbers, and tomatoes.</li> <li>• Refer to Table 12 for crop rotation restrictions.</li> </ul>

## Soybean – Postemergence Grass and Volunteer Corn Control

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<b>Grasses</b> <b>Volunteer corn</b>	quizalofop-P-ethyl <i>(Assure II/Targa)</i> + crop oil concentrate	0.044	7 oz 0.88L  + 1%	<ul style="list-style-type: none"> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• Refer to Table 2N for application rates and maximum weed sizes.</li> <li>• Apply with crop oil concentrate (1% v/v) for best results.</li> <li>• A non-ionic surfactant (0.25% v/v) may be used to replace crop oil concentrate with certain tank mixes.</li> <li>• Allow 80 days between application and soybean harvest.</li> <li>• For perennial grass control, higher rates and sequential applications may be needed (Table 2N).</li> <li>• Tank mix 5 oz/A of <i>Assure II/Targa</i> with glyphosate products (Table 10) to control glyphosate-resistant corn in glyphosate-resistant soybean. Include ammonium sulfate (17 lb/100 gal) and a minimum of 0.125% v/v of non-ionic surfactant with glyphosate products with built-in adjuvant systems.</li> <li>• Refer to Table 2O and the label for rates and additives for tank mixes with various postemergence broadleaf herbicides.</li> <li>• Tank mixes with <i>Pursuit</i> and <i>Raptor</i> are not recommended – grass antagonism will occur.</li> <li>• Grass antagonism can occur with tank mixes of postemergence broadleaf herbicides. Increasing the rate by 2 oz/A will improve grass control in certain tank mixes. Sequential applications are more effective. Apply the postemergence grass herbicide 1 day prior to the broadleaf herbicide(s) — if the broadleaf herbicide is applied first, wait 7 days or until the grasses are actively growing before applying the grass herbicide.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>

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## Soybean – Postemergence Grass and Volunteer Corn Control

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
<b>Grasses</b> <b>Volunteer corn</b>	fluzifop-P-butyl ( <i>Fusilade DX</i> )	0.188	12 oz 2L	<ul style="list-style-type: none"> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• Refer to Table 2N for application rates and maximum weed sizes.</li> <li>• Tank mix 4-6 oz/A of <i>Fusilade DX</i> with glyphosate products (Table 10) to control glyphosate-resistant corn in glyphosate-resistant soybean. Include ammonium sulfate (17 lb/100 gal). DO NOT add crop oil concentrate.</li> <li>• DO NOT apply more than 24 oz/A to soybeans prebloom or 6 oz/A from bloom through post-bloom.</li> <li>• Two applications 7-14 days apart are usually needed for control of perennial grasses.</li> <li>• Refer to Table 2O and the label for rates and additives for tank mixes with various postemergence broadleaf herbicides.</li> <li>• Tank mixes with <i>Pursuit</i> and <i>Raptor</i> are not recommended – grass antagonism will occur.</li> <li>• Grass antagonism can occur with tank mixes with post-emergence broadleaf herbicides. Sequential applications are more effective. Apply the postemergence grass herbicide 3 days prior to the broadleaf herbicide(s) – if the broadleaf herbicide is applied first, wait 7 days or until the grasses are actively growing before applying the grass herbicide.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	+		+	
	crop oil concentrate		0.5-1%	
	sethoxydim ( <i>Poast</i> ) OR ( <i>Poast Plus</i> )	0.19	16 oz 1.5SC OR 24 oz 1SC	<ul style="list-style-type: none"> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• Refer to Table 2N for application rates and maximum weed sizes.</li> <li>• Allow 75 days between application and soybean harvest.</li> <li>• <i>Poast</i> and <i>Poast Plus</i> are not as effective for control of volunteer corn or perennial grasses as the other post-emergence grass herbicides.</li> <li>• Two applications 7-14 days apart are usually needed for control of perennial grasses.</li> <li>• Refer to Table 2O and the label for rates and additives for tank mixes with various postemergence broadleaf herbicides.</li> <li>• Tank mixes with <i>Pursuit</i> and <i>Raptor</i> are not recommended – grass antagonism will occur.</li> <li>• Grass antagonism can occur with tank mixes with post-emergence broadleaf herbicides. Sequential applications are more effective. Apply the postemergence grass herbicide 1 day prior to the broadleaf herbicide(s) – if the broadleaf herbicide is applied first, wait 7 days or until the grasses are actively growing before applying the grass herbicide.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	+		+	
	crop oil concentrate		1 qt	
	+		+	
	ammonium sulfate		2.5 lb	

*(Continued on next page)*

## Soybean – Postemergence Grass and Volunteer Corn Control (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
<b>Grasses</b> <b>Volunteer corn</b>	clethodim ( <i>Select/Arrow</i> )	0.094	6 oz 2EC	<ul style="list-style-type: none"> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• Refer to Table 2N for application rates and maximum weed sizes.</li> <li>• Use only crop oil concentrate with applications of <i>Select/Arrow</i>.</li> <li>• Allow 60 days between application and soybean harvest.</li> <li>• For perennial grass control, higher rates and sequential applications may be needed (Table 2N).</li> <li>• Tank mix 4 oz/A of <i>Select/Arrow</i> or 6 oz/A of <i>SelectMax</i> with glyphosate products (Table 10) to control glyphosate-resistant corn in glyphosate-resistant soybean. Include ammonium sulfate (17 lb/100 gal).</li> <li>• Refer to Table 2O and the label for rates and additives for tank mixes with various postemergence broadleaf herbicides.</li> <li>• Tank mixes with <i>Pursuit</i> and <i>Raptor</i> are not recommended — grass antagonism will occur.</li> <li>• Grass antagonism can occur with tank mixes of postemergence broadleaf herbicides. Sequential applications are more effective. Apply the postemergence grass herbicide 1 day prior to the broadleaf herbicide(s) — if the broadleaf herbicide is applied first, wait 7 days or until the grasses are actively growing before applying the grass herbicide.</li> <li>• Tank mixes with <i>Warrant</i> have also resulted in reduced volunteer corn and grass control. To overcome this antagonism: always add AMS, increase the <i>Select Max</i> rate by 33%, apply with a crop oil concentrate, and add an acidifying agent (i.e., LI-700 or FS Transform). If <i>Select Max</i> is to be tank mixed with <i>Warrant</i> and a dicamba product (i.e., <i>XtendiMax</i> or <i>Engenia</i>), it is best to separate the applications by 3 days. However, if tank-mixed together, increase the <i>Select Max</i> rate by 33%, add a crop oil concentrate, and limit the <i>Warrant</i> rate to 2 pt/A, since AMS or an acidifying agent cannot be applied.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	+ crop oil concentrate OR ( <i>Select Max</i> )	0.068	9 oz 0.97EC	
	+ surfactant + ammonium sulfate		+ 1% OR + 0.25% + 2.5 lb	

## Soybean – Postemergence for Broadleaf Weeds

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<b>Annual broadleaves</b>	pyroxasulfone + fluthiacet ( <i>Anthem MAXX</i> ) + crop oil concentrate	0.1	3 oz 4.3SE  + 1%	<ul style="list-style-type: none"> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• Apply from planting through the V6 (6 trifoliolate) stage.</li> <li>• Application rates vary by soil type. <i>Anthem MAXX</i> rates range from 2 to 5.5 oz/A (3 oz/A).</li> <li>• Refer to Table 2K for maximum weed sizes for <i>Anthem MAXX</i>.</li> <li>• 28% liquid nitrogen (1-2 qt/A) or ammonium sulfate (2-2.5 lb/A) may be added to crop oil concentrate (1% v/v) to enhance weed control (Table 2L).</li> <li>• The pyroxasulfone component of <i>Anthem MAXX</i> will provide residual control of grass and small seeded broadleaf weeds.</li> <li>• Tank mixtures with other herbicides will be needed to broaden the spectrum of weed control.</li> <li>• Refer to Table 12 for crop rotation restrictions.</li> </ul>
	bentazon ( <i>Basagran</i> ) OR <i>Basagran 5L</i> + crop oil concentrate +/OR ammonium sulfate	1	2 pt 4L  OR 1.6 pt 5L + 1 qt +/OR 2.5 lb	<ul style="list-style-type: none"> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• Most effective on small weeds. Rate can be reduced to 1.5 pt/A (4L) or 1.2 pt/A (5L) if weeds are smaller than maximum growth stage (Table 2K).</li> <li>• 3 pt/A (4L) can suppress cocklebur up to 24 inches and velvetleaf up to 12 inches.</li> <li>• Use a minimum of 20 gal. water/A for adequate coverage.</li> <li>• DO NOT apply if soybeans are under stress from herbicide injury, cold or dry weather, or hail damage.</li> <li>• For improved velvetleaf control, 28% liquid nitrogen (2-4 qt/A) or ammonium sulfate (2.5 lb/A) can be used INSTEAD OF crop oil concentrate. However, if common ragweed and common lambsquarters are present, a crop oil concentrate must also be included (Table 2L).</li> <li>• Split applications of 1.5 pt + 1.5 pt (4L) or 1.2 pt + 1.2 pt (5L) plus crop oil concentrate (1 qt + 1 qt) can be used to control yellow nutsedge and Canada thistle. Applications should be made approximately 10 days apart. For improved Canada thistle control, increase rate to 2 pt (4L) or 1.6 pt (5L) for each application.</li> <li>• Allow 30 days between application and soybean harvest.</li> <li>• Can be tank mixed with many postemergence soybean herbicides for additional broadleaf weed control (Table 2M).</li> <li>• Can be tank mixed for postemergence grass control (Table 2O).</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>

(Continued on next page)

## Soybean – Postemergence for Broadleaf Weeds (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
<b>Annual broadleaves</b>	fluthiacet-methyl ( <i>Cadet</i> )	0.0065	0.9 oz 0.91EC	<ul style="list-style-type: none"> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• Refer to Table 2K for maximum weed sizes.</li> <li>• 28% liquid nitrogen (1-2 qt/A) or ammonium sulfate (2-2.5 lb/A) may be added to crop oil concentrate (1% v/v) to enhance weed control (Table 2L).</li> <li>• <i>Cadet</i> can be applied to soybean only between the first trifoliolate and full flowering.</li> <li>• <i>Cadet</i> can be tank-mixed at 0.5 oz/A with other herbicides for sensitive weeds such as velvetleaf.</li> <li>• DO NOT apply more than 1.25 oz/A of <i>Cadet</i> per cropping season.</li> <li>• Allow 60 days between <i>Cadet</i> application and soybean harvest.</li> <li>• <i>Cadet</i> can be tank mixed for postemergence grass control (Table 2O).</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	+		+	
	crop oil concentrate		1%	
	chlorimuron-ethyl ( <i>Classic</i> )	0.0106	0.67 oz 25WG	<ul style="list-style-type: none"> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• Labeled rates of 0.5-0.75 oz/A are most effective on small weeds (Table 2K).</li> <li>• For optimal rotational flexibility on soils with pH greater than 7.0, apply no more than 1 oz/A of <i>Classic</i> per season. On soils with a pH of 7.0 or less, a maximum of 1.5 oz/A of <i>Classic</i> can be applied during the growing season. When the rate of <i>Classic</i> is 0.33 oz/A or less, shorter rotation restrictions for alfalfa, cucumber, and watermelon are available.</li> <li>• <i>Classic</i> can be applied at 0.25 or 0.33 oz/A when tank mixed with Harmony or glyphosate.</li> <li>• Apply after the first trifoliolate leaf of soybean has fully expanded.</li> <li>• Apply with crop oil concentrate (1% v/v) or non-ionic surfactant (0.125-0.25% v/v) plus 28% liquid nitrogen (2-4 qt/A) or ammonium sulfate (2-4 lb/A).</li> <li>• Crop oil concentrate provides better control under hot conditions. However, increased injury may result (Table 2L).</li> <li>• DO NOT apply to soybeans or weeds under stress from herbicide injury or cold or dry weather — crop injury or poor weed control may result. Delay application until the stress passes.</li> <li>• 0.75 oz/A is required for Jerusalem artichoke control.</li> <li>• Allow 60 days between <i>Classic</i> application and soybean harvest.</li> <li>• <i>Classic</i> will not control ALS-resistant weed species.</li> <li>• <i>Classic</i> can be tank mixed with many postemergence soybean herbicides for additional broadleaf weed control (Table 2M).</li> <li>• <i>Classic</i> can be tank mixed for postemergence grass control (Table 2O).</li> <li>• Soil pH and <i>Classic</i> use rates are critical for rotational crops (see label).</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	+		+	
	crop oil concentrate		1%	
	+		+	
	ammonium sulfate		2-4 lb	

*(Continued on next page)*

## Soybean – Postemergence for Broadleaf Weeds (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
<b>Annual broadleaves</b>	lactofen ( <i>Cobra</i> )	0.125	8 oz 2EC	<ul style="list-style-type: none"> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• <i>Cobra</i> can be applied at 8-12.5 oz/A when tank mixed with other herbicides or when applied alone. Refer to Table 2K for maximum weed sizes.</li> <li>• Higher rates of <i>Cobra</i> 10 to 12.5 fl oz/A is needed to control common ragweed, and herbicide-resistant Palmer amaranth and common waterhemp.</li> <li>• Apply at a minimum of 20 gal. water/A at 40 psi.</li> <li>• DO NOT apply to soybeans in the cotyledon stage.</li> <li>• DO NOT apply to soybeans or weeds under stress from herbicide injury, cold or dry weather, or hail damage — crop injury or poor weed control may result. Delay application until the stress passes.</li> <li>• <i>Cobra</i> causes more soybean leaf burn than other post-emergence herbicides.</li> <li>• For best results, apply with crop oil concentrate (0.25-1.0% v/v), depending on environmental conditions (see label). Surfactant (0.25% v/v), may be substituted for crop oil concentrate when weeds are actively growing under high temperature, high humidity and high soil moisture conditions (Table 2L).</li> <li>• Allow 45 days between <i>Cobra</i> application and soybean harvest.</li> <li>• <i>Cobra</i> can be tank mixed with many postemergence soybean herbicides for additional broadleaf weed control. Follow label directions closely regarding spray additives (Table 2M).</li> <li>• <i>Cobra</i> can be tank mixed for postemergence grass control (Table 2O).</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	+		+	
	crop oil concentrate		0.5%	
	cloransulam-methyl ( <i>FirstRate</i> )	0.016	0.3 oz 84WG	<ul style="list-style-type: none"> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• Refer to Table 2K for maximum weed sizes.</li> <li>• <i>FirstRate</i> use rates range from 0.3-0.6 oz/A.</li> <li>• Applications prior to first trifoliolate stage may cause temporary yellowing.</li> <li>• Apply before soybean reach the R2 growth stage.</li> <li>• Apply with non-ionic surfactant (0.125-0.25% v/v) plus 28% nitrogen liquid (2.5% v/v) or ammonium sulfate (8.5-17 lb/100 gal). Apply with crop oil concentrate (1.2% v/v) when weeds are stressed by hot and dry conditions; soybean injury will be more severe (Table 2L).</li> <li>• 28% liquid nitrogen or ammonium sulfate must be added for velvetleaf control.</li> <li>• Allow 70 days between <i>FirstRate</i> application and soybean harvest or 25 days if soybean is used for forage or hay.</li> <li>• <i>FirstRate</i> will not control ALS-resistant weed species.</li> <li>• <i>FirstRate</i> can be tank mixed with many postemergence soybean herbicides for additional broadleaf weed control. Follow label directions closely regarding spray additives (Table 2M).</li> <li>• <i>FirstRate</i> can be tank mixed for postemergence grass control (Table 2O). However, grass antagonism may occur under certain conditions.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	+		+	
	surfactant		0.25%	
	+		+	
	ammonium sulfate		8.5-17 lb/100 gal	

*(Continued on next page)*

## Soybean – Postemergence for Broadleaf Weeds (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
<b>Annual broadleaves</b>	fomesafen ( <i>Flexstar</i> )	0.25	1 pt 1.88L	<ul style="list-style-type: none"> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• <i>Flexstar</i> can be applied only in the lower peninsula of Michigan.</li> <li>• DO NOT apply <i>Flexstar</i> or other fomesafen products to the same field in CONSECUTIVE years.</li> <li>• <i>Flexstar</i> is <i>Reflex</i> formulated with additional surfactants.</li> <li>• <i>Flexstar</i> is most effective when weeds are small (Table 2K).</li> <li>• <i>Flexstar</i> can be reduced to 0.75 pt/A to control certain smaller weeds (Table 2K).</li> <li>• Apply with crop oil concentrate (0.5-1.0% v/v) or non-ionic surfactant (0.25-0.5% v/v). 28% liquid nitrogen (2.5% v/v) or ammonium sulfate (8.5 lb/100 gal) can be added to either crop oil concentrate or surfactant for improved weed control (Table 2L).</li> <li>• Apply at 10-20 gal. water/A at 30-60 psi.</li> <li>• <i>Flexstar</i> can be tank mixed with many postemergence soybean herbicides for additional broadleaf weed control. Follow label directions closely regarding spray additives (Table 2M).</li> <li>• <i>Flexstar</i> can be tank mixed for postemergence grass control (Table 2O).</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	+		+	
	crop oil concentrate		0.5-1.0%	
	+		+	
	ammonium sulfate		8.5 lb/100 gal	
	thifensulfuron-methyl ( <i>Harmony SG</i> )	0.004	0.125 50WG	<ul style="list-style-type: none"> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• <i>Harmony</i> is most effective on small weeds (Table 2K).</li> <li>• Apply after the first trifoliolate leaf of soybeans has fully expanded.</li> <li>• Applications of <i>Harmony</i> may cause temporary wilting, leaf yellowing, and stunting.</li> <li>• DO NOT apply to soybeans or weeds under stress from weed control may result. Delay application until the stress passes.</li> <li>• Allow 60 days between <i>Harmony</i> application and soybean harvest.</li> <li>• Apply with non-ionic surfactant (0.125-0.25% v/v) or crop oil concentrate (1% v/v) plus 28% liquid nitrogen (2-4 qt/A) or ammonium sulfate (2-4 lb/A). The addition of a nitrogen source is required for velvetleaf control.</li> <li>• Under dry conditions, <i>Harmony</i> can be applied with crop oil concentrate, but soybean injury is likely to be more severe.</li> <li>• Use a minimum of 10 gal. water/A. For heavy weed pressure, increase volume to 15 gal/A.</li> <li>• <i>Harmony</i> will not control ALS-resistant weed species.</li> <li>• <i>Harmony</i> can be tank mixed with many postemergence soybean herbicides for additional broadleaf weed control. Follow label directions closely regarding spray additives (Table 2M).</li> <li>• <i>Harmony</i> can be tank mixed for postemergence grass control (Table 2O).</li> <li>• <b>Special precaution:</b> A special sprayer clean-out procedure is required (see label).</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	+		+	
	surfactant		0.125-0.25%	
	+		+	
	ammonium sulfate		2-4 lb	

*(Continued on next page)*

## Soybean – Postemergence for Broadleaf Weeds (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
<b>Annual broadleaves</b>	fluthiacet + fomesafen <i>(Marvel)</i> + crop oil concentrate	0.17	7.25 fl oz 3L  + 1%	<ul style="list-style-type: none"> <li>• Refer to Table 2A for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• 28% liquid nitrogen (1-2 qt/A) or ammonium sulfate (2.5 lb/A) may be added to enhance weed control.</li> <li>• Apply <i>Marvel</i> from the first trifoliolate through full flower (prior to R3 stage).</li> <li>• Allow 60 days between <i>Marvel</i> application and soybean harvest.</li> <li>• <i>Marvel</i> can be tank mixed for postemergence grass control (Table 2O).</li> <li>• DO NOT apply more than 0.24 lb ai/A of fomesafen (from any fomesafen containing product) (i.e., 1 pt/A of <i>Reflex</i>) to the same field in CONSECUTIVE years.</li> <li>• Refer to Table 12 for crop rotation restrictions.</li> </ul>
	pyroxasulfone + flumiclorac <i>(Perpetuo)</i> + crop oil concentrate + AMS	0.11	6 oz 2.3L  + 1% + 2.5 lb	<ul style="list-style-type: none"> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• DO NOT apply after V6 (6 trifoliolate) soybean.</li> <li>• <i>Perpetuo</i> use rates range from 6 to 10 oz/A. DO NOT apply more than 8 oz/A on coarse textured soils.</li> <li>• Refer to Table 2K for maximum weed sizes for <i>Perpetuo</i>.</li> <li>• The pyroxasulfone component of <i>Perpetuo</i> will provide residual control of grass and small seeded broadleaf weeds.</li> <li>• Tank mixtures with other herbicides will be needed to broaden the spectrum of weed control. Please refer to tank-mix partner adjuvant requirements.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	s-metolachlor + fomesafen <i>(Prefix)</i> + surfactant	1.32	2 pt 5.29L  + 0.25%	<ul style="list-style-type: none"> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• Apply from planting up until 90 day prior to harvest.</li> <li>• Postemergence applications may cause temporary leaf bronzing and crinkling.</li> <li>• Refer to Table 2K for maximum weed sizes for <i>Prefix</i>.</li> <li>• Include 0.25% v/v of a non-ionic surfactant unless applied with glyphosate with a built-in adjuvant. DO NOT use crop oil concentrate or soybean injury will be increased (Table 2L).</li> <li>• The s-metolachlor component of <i>Prefix</i> will provide residual control of grass and small seeded broadleaf weeds.</li> <li>• DO NOT apply more than 0.24 lb ai/A of fomesafen (from any fomesafen containing product) (i.e., 1 pt/A of <i>Reflex</i>) to the same field in CONSECUTIVE years.</li> <li>• Refer to Table 12 for crop rotation restrictions.</li> </ul>

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## Soybean – Postemergence for Broadleaf Weeds (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
<b>Annual broadleaves</b>	imazethapyr <i>(Pursuit)</i>	0.063	4 oz 2L	<ul style="list-style-type: none"> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• Refer to Table 2K for maximum weed sizes.</li> <li>• Apply with crop oil concentrate (1% v/v) or non-ionic surfactant (0.25% v/v) plus 28% liquid nitrogen (2.5% v/v) or ammonium sulfate (12-15 lb/100 gal) (Table 2L).</li> <li>• Will control yellow and green foxtails, barnyardgrass and crabgrass up to 3 inches tall, and giant foxtail up to 6 inches tall.</li> <li>• Apply after the first trifoliolate leaf of soybeans has fully expanded.</li> <li>• Allow 85 days between <i>Pursuit</i> application and soybean harvest.</li> <li>• <i>Pursuit</i> will not control ALS-resistant weed species.</li> <li>• <i>Pursuit</i> can be tank mixed with many postemergence soybean herbicides for additional broadleaf weed control. Follow label directions closely regarding spray additives (Table 2M).</li> <li>• <i>Pursuit</i> can be tank mixed with postemergence grass herbicides for volunteer corn control only (Table 2O).</li> <li>• <i>Pursuit</i> is very persistent and can limit rotational crops. Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	+ crop oil concentrate + ammonium sulfate		+ 1% + 12-15 lb/100 gal	
	imazamox <i>(Raptor)</i>	0.04	5 oz 1L	<ul style="list-style-type: none"> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• Refer to Table 2K for maximum weed sizes.</li> <li>• Apply with crop oil concentrate (1% v/v) or non-ionic surfactant (0.25% v/v) plus 28% liquid nitrogen (2.5% v/v) or ammonium sulfate (12-15 lb/100 gal) (Table 2L).</li> <li>• Apply after the first trifoliolate leaf of soybeans has fully expanded but before soybean bloom.</li> <li>• Will control barnyardgrass, foxtails and panicum but ONLY SUPPRESS crabgrass.</li> <li>• Application rate must be 5 oz/A for annual grass and common lambsquarters control OR apply <i>Prowl</i> preemergence for control of these weeds.</li> <li>• Common ragweed less than 3 inches will be suppressed.</li> <li>• Increase common ragweed control by tank mixing with <i>Cobra</i> (4-6 oz/A), <i>Ultra Blazer</i> (8-16 oz/A), or <i>Flexstar</i> (6-8 oz/A). Higher rates can cause grass antagonism (Table 2M).</li> <li>• <i>Raptor</i> will not control ALS-resistant weed species.</li> <li>• DO NOT tank mix with postemergence grass herbicides unless for volunteer corn — antagonism will occur and grass control will equal that of <i>Raptor</i> alone.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	+ crop oil concentrate + ammonium sulfate		+ 1% + 12-15 lb/100 gal	

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## Soybean – Postemergence for Broadleaf Weeds (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
Annual broadleaves	fomesafen ( <i>Reflex</i> )	0.25	1 pt 2L	<ul style="list-style-type: none"> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• <i>Reflex</i> can be applied only in the lower peninsula of Michigan.</li> <li>• DO NOT apply <i>Reflex</i> or other fomesafen products to the same field in CONSECUTIVE years.</li> <li>• <i>Reflex</i> is most effective when weed are small (Table 2K).</li> <li>• <i>Reflex</i> can be reduced to 0.75 pt/A to control certain smaller weeds (Table 2K).</li> <li>• Apply with crop oil concentrate (0.5-1.0% v/v) or non-ionic surfactant (0.25-0.5% v/v). 28% liquid nitrogen (2.5% v/v) or ammonium sulfate (10 lb/100 gal) can be added to either crop oil concentrate or surfactant for improved weed control (Table 2L).</li> <li>• Apply at 10-20 gal. water/A at 30-60 psi.</li> <li>• <i>Reflex</i> can be tank mixed with many postemergence soybean herbicides for additional broadleaf weed control. Follow label directions closely regarding spray additives (Table 2M).</li> <li>• <i>Reflex</i> can be tank mixed for postemergence grass control (Table 2O).</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	+		+	
	crop oil concentrate		1%	
+	+			
ammonium sulfate		10 lb/100 gal		
	flumiclorac ( <i>Resource</i> )	0.041	6 oz 0.86L	<ul style="list-style-type: none"> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• Refer to Table 2K for maximum weed sizes.</li> <li>• 28% liquid nitrogen (1-2 qt/A) or ammonium sulfate (2-2.5 lb/A) may be added to crop oil concentrate (1 qt/A) to enhance weed control.</li> <li>• <i>Resource</i> can be applied at 2-4 oz/A when tank mixed with other herbicides for additional broadleaf weed control (Table 2M).</li> <li>• Allow 60 days between <i>Resource</i> application and soybean harvest.</li> <li>• <i>Resource</i> can be tank mixed for postemergence grass control (Table 2O).</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
+	+			
crop oil concentrate	1 qt			
	chlorimuron-ethyl + thifensulfuron-methyl ( <i>Synchrony XP</i> )	0.013	0.75 oz 28.4WG	<ul style="list-style-type: none"> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• Refer to Table 2K for maximum weed sizes.</li> <li>• ONLY apply 0.75 oz/A of <i>Synchrony XP</i> to STS SOYBEANS.</li> <li>• <i>Synchrony XP</i> at 0.375 oz/A can be applied to NON-STs soybeans. DO NOT use crop oil concentrate. Instead, use a non-ionic surfactant at 0.25% v/v.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• Apply after the first trifoliolate leaf of soybeans has fully expanded.</li> <li>• For eastern black nightshade control, add <i>Cobra</i> (4-6 oz/A) or <i>Reflex</i> or <i>Flexstar</i> (1 pt/A) or <i>Ultra Blazer</i> (1 pt/A) or <i>Pursuit</i> (2 oz/A). Reduce the rate of crop oil concentrate to 0.5% if tank mixed with <i>Cobra</i>. DO NOT use crop oil concentrate if <i>Pursuit</i> or <i>Ultra Blazer</i> is tank mixed for nightshade control (Table 2M).</li> <li>• Allow 60 days between <i>Synchrony XP</i> application and soybean harvest.</li> <li>• <i>Synchrony XP</i> will not control ALS-resistant weed species.</li> <li>• <i>Synchrony XP</i> will suppress pokeweed, perennial sowthistle, and dandelion.</li> <li>• <i>Synchrony XP</i> can be tank mixed for control of some grasses (Table 2O).</li> <li>• Soil pH and <i>Synchrony XP</i> use rates are critical for rotational crops (see label).</li> <li>• Rotation intervals are dependent on soil pH and rate. Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
+	+			
crop oil concentrate		1%		
+	+			
ammonium sulfate			2 lb	

*(Continued on next page)*

## Soybean – Postemergence for Broadleaf Weeds (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
<b>Annual broadleaves</b>	acifluorfen ( <i>Ultra Blazer</i> )	0.38	1.5 pt 2SC	<ul style="list-style-type: none"> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• Most effective on small weeds (Table 2K).</li> <li>• Use a minimum of 20 gal. water/A for adequate coverage.</li> <li>• DO NOT apply if soybeans are under stress from herbicide injury, cold or dry weather, or hail damage.</li> <li>• 28% liquid nitrogen (2-4 qt/A) or ammonium sulfate (2.5 lb/A) may be added INSTEAD OF surfactant for improved weed control.</li> <li>• Allow 50 days between <i>Ultra Blazer</i> application and soybean harvest.</li> <li>• <i>Ultra Blazer</i> can be tank mixed with most postemergence soybean herbicides for additional broadleaf weed control (Table 2M).</li> <li>• <i>Ultra Blazer</i> can be tank mixed for postemergence grass control (Table 2O).</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	+		+	
	surfactant OR ammonium sulfate		0.25% OR 2.5 lb	
	basagran + imazamox ( <i>Varisto</i> )	0.68	21 oz 4.18L	<ul style="list-style-type: none"> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• <i>Varisto</i> can be applied at rates from 21 to 27 fl oz/A.</li> <li>• Refer to Table 2K for maximum weed sizes.</li> <li>• Apply with crop oil concentrate (1% v/v), methylated seed oil (1% v/v), or non-ionic surfactant (0.25% v/v) plus 28% liquid nitrogen (2.5% v/v) or ammonium sulfate (12-15 lb/100 gal).</li> <li>• DO NOT apply if soybeans have begun to flower.</li> <li>• DO NOT tank-mix with postemergence grass herbicides unless for volunteer corn – grass antagonism will occur.</li> <li>• DO NOT make more than one application of <i>Varisto</i> per season or apply more than 27 fl oz/A per season.</li> <li>• DO NOT graze or cut treated soybean fields for forage or hay for at least 30 days after application.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	+		+	
	crop oil concentrate		1%	
	+		+	
ammonium sulfate	12-15 lb/100 gal			
	acetochlor + fomesafen ( <i>Warrant Ultra</i> )	1.3	50 oz 3.45CS	<ul style="list-style-type: none"> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• Apply before soybean reach the R2 growth stage.</li> <li>• Postemergence applications may cause temporary leaf bronzing and crinkling.</li> <li>• Refer to Table 2K for maximum weed sizes for <i>Warrant Ultra</i>.</li> <li>• Include 0.25-0.5% v/v of a non-ionic surfactant unless applied with glyphosate with a built-in adjuvant. Crop oil concentrate or a methylated seed oil may be used, however soybean injury will be increased (Table 2L).</li> <li>• The acetochlor component of <i>Warrant</i> will provide residual control of grass and small seeded broadleaf weeds.</li> <li>• DO NOT apply more than 0.24 lb ai/A of fomesafen (from any fomesafen containing product) (i.e., 1 pt/A of <i>Reflex</i>) to the same field in CONSECUTIVE years.</li> <li>• Refer to Table 12 for crop rotation restrictions.</li> </ul>
	+		+	
	surfactant		0.25%	

## TABLE 2E – Weed Control in Glyphosate-Resistant Soybean (RR/GT)

**RECOMMENDATIONS:** One application of glyphosate alone will not consistently provide season-long weed control. One of the following strategies is recommended:

- 1) Soil-applied residual herbicide applied preemergence followed by glyphosate postemergence.
  - a) Preemergence herbicide options can be found in Table 2A.
  - b) Glyphosate should be applied when weeds are 4 inches tall.
- 2) Postemergence tank-mixtures with glyphosate when weeds are 2-4 inches tall.
  - a) Several soil-applied residual herbicides can be tank-mixed with glyphosate and applied postemergence. Tank-mixtures with some residual herbicides may cause temporary burn or discoloration.
  - b) There are many postemergence products that can be tank-mixed with glyphosate for additional weed control. Refer to Table 2B for options.
  - c) There are several premixtures containing glyphosate that can be applied postemergence to glyphosate-resistant soybean. Refer to Table 2B and the following section for options.

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<b>Annual grasses</b> <b>Annual broadleaves</b> <b>Suppression of</b> <b>perennials</b>	glyphosate (See Table 10) + ammonium sulfate	1.13 a.e.	See Table 10 + 17 lb/100 gal	<ul style="list-style-type: none"> <li>• <b>APPLY TO GLYPHOSATE-RESISTANT SOYBEANS ONLY.</b></li> <li>• <b>See above recommendations for appropriate use of glyphosate in glyphosate-resistant soybean.</b></li> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• Many glyphosate products are registered for application to glyphosate-resistant soybeans. Read the label and see Table 10 to determine application rates and additives needed for different products.</li> <li>• For best results apply glyphosate at 1.13 lb a.e./A. DO NOT apply below a minimum rate of 0.75 lb a.e./A.</li> <li>• Higher rates of glyphosate (1.5 lb a.e./A) can be applied for perennial weed control and to control larger weeds and weeds under stress.</li> <li>• Addition of ammonium sulfate (17 lb/100 gal) will minimize antagonism from hard water and improve weed control if weeds are under stress or large.</li> <li>• Glyphosate should be applied before annual weeds are 4 inches tall to reduce weed competition and maximize soybean yield.</li> <li>• Use extreme caution to avoid spray drift to sensitive crops.</li> <li>• Apply from soybean cracking through full flower (R2 soybean).</li> <li>• DO NOT apply more than 2.25 lb a.e./A in-crop per season.</li> <li>• For VOLUNTEER GLYPHOSATE-RESISTANT CORN control, tank mix glyphosate (Table 10) with <i>Assure II/Targa</i>, <i>Fusilade DX</i>, <i>Select/Arrow</i> or <i>Select Max</i> (Table 2N). Consult product remarks and limitations in E0434 and labels for additive choices and rates.</li> <li>• Control of PERENNIAL BROADLEAVES will be improved with a second application of glyphosate prior to soybean full flower.</li> <li>• For QUACKGRASS control, treat when quackgrass is 6-8 inches tall.</li> <li>• For YELLOW NUTSEDGE suppression, apply glyphosate when nutsedge is 3-4 inches tall. Adding <i>Classic</i> at 0.75 oz/A OR making a second glyphosate application 2-3 weeks later will improve suppression.</li> <li>• The addition of micronutrient fertilizers (e.g., manganese) can antagonize glyphosate, resulting in a reduction in weed control. Avoid antagonisms by making separate herbicide and fertilizer applications or using a full-chelated form of the fertilizer and including ammonium sulfate to minimize the antagonism.</li> </ul>

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## Weed Control in Glyphosate-Resistant Soybean (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
Annual grasses Annual broadleaves Suppression of perennials	glyphosate + imazethapyr <i>(Extreme)</i>	0.81	3 pt 2.17L	<ul style="list-style-type: none"> <li>• <b>APPLY TO GLYPHOSATE-RESISTANT SOYBEANS ONLY.</b></li> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• <i>Extreme</i> is a premix of <i>Pursuit</i> + glyphosate. See Table 2C for individual product rate equivalents for the premix.</li> <li>• Apply to weeds up to 4 inches tall.</li> <li>• Apply after the first trifoliate leaf of soybean has fully expanded up to soybean bloom.</li> <li>• Addition of ammonium sulfate will minimize antagonism from hard water and improve weed control if weeds are under stress or large.</li> <li>• Use extreme caution to avoid spray drift to sensitive crops.</li> <li>• <i>Pursuit</i> is very persistent and can limit rotational crops. Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
	+	+	0.25%	
	surfactant		+	
	ammonium sulfate			
	glyphosate + fomesafen <i>(Flexstar GT 3.5)</i>	1.23	3.5 pt 2.82L	<ul style="list-style-type: none"> <li>• <b>APPLY TO GLYPHOSATE-RESISTANT SOYBEANS ONLY.</b></li> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• <i>Flexstar GT</i> is a premix of <i>Flexstar</i> and glyphosate. See Table 2C for individual product rate equivalents for the premix.</li> <li>• DO NOT apply products containing fomesafen (<i>Flexstar</i>, <i>Flexstar GT 3.5</i>, <i>Prefix</i>, <i>Reflex</i>, or <i>Warrant Ultra</i>) to the same field in CONSECUTIVE years.</li> <li>• Some cosmetic bronzing and leaf crinkling can occur after application.</li> <li>• Best if applied when weeds are 4 inches tall or less.</li> <li>• Apply in 15 to 20 gal. water/A.</li> <li>• DO NOT apply within 45 days of soybean harvest.</li> <li>• Refer to label and Table 12 for additional crop rotation.</li> </ul>
+	+	0.25%	+	
surfactant		+	+	
ammonium sulfate			17 lb/100 gal	
	glyphosate + s-metolachlor <i>(Sequence)</i>	1.64	2.5 pt 5.25L	<ul style="list-style-type: none"> <li>• <b>APPLY TO GLYPHOSATE-RESISTANT SOYBEANS ONLY.</b></li> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• <i>Sequence</i> is a premix of <i>Dual Magnum</i> + glyphosate. See Table 2C for individual product rate equivalents for the premix.</li> <li>• Apply from soybean cracking through full flower (R2 soybean). DO NOT apply within 75 days prior to harvest (PHI).</li> <li>• Cosmetic leaf crinkling or necrotic spots may occur under certain conditions.</li> <li>• The maximum single use rate of <i>Sequence</i> preemergence or postemergence is 4.5 pt/A. DO NOT apply more than 3.7 lb ai/A of s-metolachlor or 9.8 pt/A of <i>Sequence</i> per year.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
+	+	+	+	
ammonium sulfate			17 lb/100gal	
	acetochlor <i>(Warrant)</i>	1.125	3 pt 3CS	<ul style="list-style-type: none"> <li>• <b>APPLY TO GLYPHOSATE-RESISTANT SOYBEAN WHEN TANK-MIXED WITH GLYPHOSATE.</b></li> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• Apply from emergence up to R2 soybean.</li> <li>• <i>Warrant</i> applied alone will not control emerged weeds, but will provide residual control of annual grasses and some small seeded weed species, e.g., pigweed and nightshade. Therefore, it is recommended <i>Warrant</i> be applied with postemergence weed control products (e.g., glyphosate).</li> <li>• Tank-mixtures with glyphosate should be applied when weeds are 2 to 4 inches tall.</li> <li>• Cosmetic soybean leaf crinkling may occur under certain conditions.</li> <li>• DO NOT apply more than 4 qt/A of <i>Warrant</i> per season.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>
+	+	+	+	
glyphosate		1.13 a.e.	See Table 10	
+	+	+	+	
ammonium sulfate			17 lb/100 gal	

## TABLE 2F – Weed Control in Glufosinate-Resistant (LibertyLink) Soybean

**RECOMMENDATIONS:** One application of *Liberty* (glufosinate) alone will not consistently provide season-long weed control. The following strategy is recommended:

- 1) Soil-applied residual herbicide applied preemergence followed by *Liberty* postemergence.
  - a) Preemergence herbicide options can be found in Table 2A.
  - b) *Liberty* should be applied when weeds are 2-3 inches tall.
  - c) Early canopy closure from planting narrow row soybean will help improve season-long weed control.
  - d) Several soil-applied residual herbicides can be tank-mixed with *Liberty* and applied postemergence. Tank-mixtures with some residual herbicides may cause some temporary burn or discoloration.
  - e) An additional application of *Liberty* can be applied if needed.

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<b>Annual grasses</b> <b>Annual broadleaves</b>	glufosinate <i>(Liberty)</i> + ammonium sulfate	0.58	32 oz 2.34L + 8.5 lb/100 gal	<ul style="list-style-type: none"> <li>• <b>APPLY TO GLUFOSINATE-RESISTANT (LIBERTYLINK) SOYBEANS ONLY.</b></li> <li>• <b>See above recommendations for appropriate use of <i>Liberty</i> in LibertyLink soybean.</b></li> <li>• There are other glufosinate products (i.e., <i>Cheetah</i>, <i>Interline</i>, <i>Noventa</i>) registered for use in LibertyLink soybean, consult specific labels.</li> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• Refer to Table 2K for application rates and maximum broad-leaf weed sizes.</li> <li>• Always add ammonium sulfate (8.5-17 lb/100 gal). If conditions are hot and humid, the ammonium sulfate rate should be 8.5 lb/100 gal.</li> <li>• Apply from soybean emergence up to but not including the bloom stage (R1 soybean).</li> <li>• Reduced weed control can occur if <i>Liberty</i> is applied 2 hours before sunset or later.</li> <li>• <i>Liberty</i> can be applied at rates ranging 32 – 43 oz/A depending on weed species and size.</li> <li>• If required, a second application of 32 – 43 oz/A of <i>Liberty</i> can be applied up to a yearly maximum of 87 oz/A.</li> <li>• Allow 70 days between <i>Liberty</i> application and soybean harvest.</li> <li>• Use a minimum carrier volume of 15 gallons per acre.</li> <li>• The use of drift control agents that reduce spray coverage will result in reduced weed control from <i>Liberty</i>.</li> <li>• Refer to label and Table 12 for crop rotation restrictions.</li> </ul>

*(Continued on next page)*

## Weed Control in Glufosinate-Resistant (LibertyLink) Soybean *(continued)*

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
<b>Annual grasses</b> <b>Annual broadleaves</b>	glufosinate + fomesafen <i>(Cheetah Max)</i> + ammonium sulfate	0.75	1 qt 3L  + 17 lb/100 gal	<ul style="list-style-type: none"> <li>• <b>APPLY TO LIBERTYLINK (glufosinate-resistant) SOYBEANS ONLY.</b></li> <li>• Refer to Table 2B for weed control and crop tolerance ratings.</li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• Always add ammonium sulfate (8.5-17 lb/100 gal). If conditions are hot and humid, the ammonium sulfate rate should be 8.5 lb/100 gal.</li> <li>• No additional surfactant is needed with tank mixtures. Tank mixtures with EC formulations can increase crop injury.</li> <li>• Apply from soybean emergence up to but not including the bloom stage (R1 soybean).</li> <li>• Postemergence applications may cause temporary leaf bronzing and crinkling.</li> <li>• Refer to Table 2K for maximum weed sizes for <i>Cheetah Max</i>.</li> <li>• DO NOT apply more than one application of <i>Cheetah Max</i> or apply more than 0.24 lb ai/A of fomesafen (from any fomesafen containing product) to the same field in CONSECUTIVE years.</li> <li>• <i>Liberty</i> or other glufosinate products can be applied as long as no more than 87 oz/A of <i>Liberty</i> is applied per year.</li> <li>• Allow 70 days between <i>Cheetah Max</i> application and soybean harvest.</li> <li>• Refer to Table 12 for crop rotation restrictions.</li> </ul>

## TABLE 2G – Weed Control in LibertyLink GT27 (Glufosinate and Glyphosate-Resistant) Soybean

**RECOMMENDATIONS:** One application of *Liberty* (glufosinate) or glyphosate alone will not consistently provide season-long weed control. The following strategy is recommended:

- 1) Soil-applied residual herbicide applied preemergence followed by *Liberty* (glufosinate) or glyphosate postemergence.
  - a) Preemergence herbicide options can be found in Table 2A.
  - b) If using *Liberty* (glufosinate) postemergence, apply when weeds are 2-3 inches tall.
  - c) If using glyphosate postemergence, apply when weeds are less than 4 inches tall. Glyphosate will not control glyphosate (Group 9)-resistant weeds.
  - d) Early canopy closure from planting soybean in narrow rows will help improve season-long weed control.
  - e) In addition, several soil-applied residual herbicides can be tank-mixed with either *Liberty* (glufosinate) or glyphosate and applied postemergence for extended residual control. Check the remarks and limitations of residual herbicides to determine which ones can be used postemergence. Tank-mixtures with some residual herbicides may cause temporary burn or discoloration.
  - f) An additional application of *Liberty* (glufosinate) or glyphosate can be applied if needed.

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<b>Annual grasses</b> <b>Annual broadleaves</b>	glufosinate ( <i>Liberty</i> ) +	0.58	32 oz 2.34L +	<ul style="list-style-type: none"> <li>• <b>LibertyLink GT27 soybean are resistant to both glufosinate and glyphosate.</b></li> <li>• Glufosinate and glyphosate products can be applied over-the-top (postemergence) of LibertyLink soybean.</li> <li>• There are several glufosinate and glyphosate products that are registered for use in LibertyLink GT27 soybean, consult specific labels.</li> <li>• Refer to Table 2E for specific information and restrictions on the use of postemergence applications of glyphosate.</li> <li>• Refer to Table 2F for specific information and restrictions on the use of postemergence applications of <i>Liberty</i> (glufosinate).</li> <li>• The use of <i>Liberty</i> (glufosinate) will control most glyphosate-resistant weeds found in Michigan.</li> <li>• Tank-mixtures of <i>Liberty</i> (glufosinate) and glyphosate have provided mixed results. In some cases, these combinations have resulted in slight antagonisms of certain weed species, especially grasses and perennials. However, in the case of controlling glyphosate-resistant species, in particular glyphosate-resistant Palmer amaranth and waterhemp, the addition of glyphosate does not appear to antagonize glufosinate effectiveness on these species.</li> </ul>
	ammonium sulfate OR	OR	8.5 lb/100 gal OR	
<b>Annual grasses</b> <b>Annual broadleaves</b>	glyphosate (See Table 10)	1.13 a.e	See Table 10	
<b>Suppression of perennials</b>	+		+	
	ammonium sulfate		17 lb/100gal	



## TABLE 2H – Weed Control in Enlist E3 (2,4-D Choline, Glufosinate, and Glyphosate-Resistant) Soybean

**RECOMMENDATIONS:** One application of *Enlist Duo* (2,4-D choline + glyphosate), glufosinate (i.e., *Liberty*) or glyphosate alone will not consistently provide season-long weed control. The following strategy is recommended:

- 1) Soil-applied residual herbicide applied preemergence followed by glufosinate (i.e., *Liberty*), glyphosate, *Enlist One* + glufosinate, *Enlist One* + glyphosate, or *Enlist Duo* postemergence. In no-till situations, *Enlist One* or *Enlist Duo* can be included in the burndown. Refer to Table 2Q for more information.
  - a) Preemergence herbicide options can be found in Table 2A.
  - b) If using glufosinate (i.e., *Liberty*) postemergence, refer to Table 2F for specific information and restrictions.
  - c) If using glyphosate postemergence, refer to Table 2E for specific information and restrictions. Remember, glyphosate will not control glyphosate (Group 9)-resistant weeds.
  - d) If using *Enlist One* or *Enlist Duo* postemergence, refer to specific information and restrictions below.
  - e) Early canopy closure from planting soybean in narrow rows will help improve season-long weed control.
  - f) In addition, several soil-applied residual herbicides can be tank-mixed with postemergence herbicide applications for extended residual control. Check the remarks and limitations of residual herbicides to determine which ones can be used postemergence. Tank-mixtures with some residual herbicides may cause temporary burn or discoloration.
  - g) An additional application of glufosinate (i.e., *Liberty*), glyphosate, *Enlist One*, or *Enlist Duo* can be applied if needed.

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<b>Annual and perennial broadleaves</b>	2,4-D choline ( <i>Enlist One</i> )	0.95	2 pt 3.8L	<ul style="list-style-type: none"> <li>• <b>APPLY TO ENLIST E3 (2,4-D-resistant) SOYBEANS ONLY.</b></li> <li>• Enlist E3 soybean are resistant to 2,4-D choline, glufosinate, and glyphosate.</li> <li>• The 2,4-D choline formulation in <i>Enlist One</i> is the only registered 2,4-D formulation for use in Enlist E3 soybeans.</li> <li>• Can be applied <b>preplant, preemergence, or postemergence</b> (no later than R2 soybean).</li> <li>• Apply 1.5 to 2 pt/A of <i>Enlist One</i>. Use the higher rate to control less susceptible species, weeds 6 inches tall or larger, and perennials.</li> <li>• Refer to Table 2B for postemergence weed control and crop tolerance ratings.</li> <li>• Refer to Table 2Q for information on preplant and preemergence burndown uses in no-till <i>Enlist E3</i> soybean.</li> <li>• DO NOT apply more than one preemergence and no more than two postemergence applications of <i>Enlist One</i> per season.</li> <li>• DO NOT exceed 2 pt/A of <i>Enlist One</i> per application or 6 pt/A per season.</li> <li>• DO NOT mix with any other herbicide or additive without first consulting <b>EnlistTankmix.com</b> within 7 days prior to application for the approved list of tank mix partners.</li> <li>• Several broadleaf plants including non-Enlist soybean are extremely susceptible to 2,4-D.</li> <li>• CAUTION should be taken to avoid spray system contamination, vapor and/or spray particle drift.</li> <li>• Specific guidelines for use are <b>required</b> when applying <i>Enlist One</i> to Enlist E3 soybeans. Information on application guidelines and stewardship to reduce potential off-target movement of <i>Enlist One</i> can be found in the following section, "<b>Guidelines and Precautions for 2,4-D Use in Enlist E3 Soybean</b>".</li> <li>• Refer to Table 12 for crop rotation restrictions.</li> </ul>

*(Continued on next page)*

**Weed Control in Enlist E3 (2,4-D Choline, Glufosinate, and Glyphosate-Resistant) Soybean (continued)**

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<b>Annual grasses</b> <b>Annual broadleaves</b> <b>Perennials</b>	2,4-D choline glyphosate <i>(Enlist Duo)</i>	1.98	4.75 pt 3.33L	<ul style="list-style-type: none"> <li>• <b>APPLY TO ENLIST E3 (2,4-D-resistant) SOYBEANS ONLY.</b></li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• Can be applied <b>preplant, preemergence, or postemergence</b> (no later than R2 soybean).</li> <li>• Apply 3.5 to 4.75 pt/A of <i>Enlist Duo</i>. Use the higher rate to control less susceptible species, weeds 6 inches tall or larger, and perennials.</li> <li>• Refer to Table 2B for postemergence weed control and crop tolerance ratings.</li> <li>• Refer to Table 2Q for information on preplant and preemergence burndown uses in no-till Enlist E3 soybean.</li> <li>• DO NOT apply more than one preemergence and no more than two postemergence applications of <i>Enlist Duo</i> per season.</li> <li>• DO NOT exceed 4.75 pt/A of <i>Enlist Duo</i> per application or 14.25 pt/A per season.</li> <li>• DO NOT mix with any other herbicide or additive without first consulting <b>EnlistTankmix.com</b> within 7 days prior to application for the approved list of tank mix partners.</li> <li>• Several broadleaf plants including non-Enlist soybean are extremely susceptible to 2,4-D.</li> <li>• Specific guidelines for use are <b>required</b> when applying <i>Enlist Duo</i> to Enlist E3 soybeans. Information on application guidelines and stewardship to reduce potential off-target movement of <i>Enlist Duo</i> can be found in the following section, <b>"Guidelines and Precautions for 2,4-D Use in Enlist E3 Soybean"</b>.</li> <li>• Refer to Table 12 for crop rotation restrictions.</li> </ul>

# Guidelines and Precautions for 2,4-D Use in Enlist E3 Soybean

The Enlist system in soybean was developed as a tool to help manage herbicide-resistant weeds. This system enables growers to apply registered 2,4-D choline formulations to soybean designated as Enlist E3. In addition to 2,4-D resistance, these soybeans are also resistant to glufosinate (i.e., *Liberty*) and glyphosate. Making this the first soybean technology where three different herbicide active ingredients that could not previously be used together in soybean, now an option. The 2,4-D resistance in Enlist E3 soybeans also allows farmers to apply registered 2,4-D choline products in burndown herbicide applications right up to and after planting of Enlist E3 soybean without a plant-back window. The glufosinate resistance in the Enlist E3 soybean also provides an additional herbicide site of action that growers can use to manage glyphosate- and multiple-resistant weed species. The use of both 2,4-D and glufosinate together provides the use of multiple herbicide sites of action to help manage glyphosate and multiple-resistant weeds in Michigan, including horseweed (marestail), Palmer amaranth, and waterhemp. However, as with any herbicide system it is important to keep in mind that every application of either glufosinate or 2,4-D increases the selection for herbicide resistance. If a grower decides to use this technology it will be important to use an integrated approach to control problematic and resistant weeds. An overreliance on any one of these herbicides will lead to the development of additional herbicide resistances.

There are several plant species across the landscape that are susceptible to 2,4-D. Off-target movement of 2,4-D to susceptible plants can be a concern with postemergence 2,4-D use. The recent development of the lower volatility 2,4-D choline formulation registered for use in Enlist E3 soybean greatly reduces this risk. However, to help ensure that susceptible species are not damaged by 2,4-D exposure, there are several label guidelines that need to be followed. Below is a synopsis of some of the label guidelines and restrictions that must be followed if a grower decides to use 2,4-D choline in Enlist E3 soybean. Remember it is the responsibility of the applicator to protect sensitive areas and susceptible crops from 2,4-D injury.

## Label Guidelines and Restrictions:

- 1. Use only approved 2,4-D products.** Currently, *Enlist One* and *Enlist Duo* (2,4-D choline + glyphosate) are the only 2,4-D products registered for preplant, preemergence, or postemergence use in Enlist E3 soybean. **Use of other 2,4-D formulations is a violation of state and federal law.**
- 2. Wind direction.** There is a strict requirement on the approved *Enlist One* and *Enlist Duo* labels that states that 2,4-D should not be applied if the wind is blowing towards adjacent commercially grown tomatoes and other fruiting vegetables (EPA crop group 8), cucurbits (EPA crop group 9), and grapes. In fact, there are certain townships in Michigan's grape growing region that restrict 2,4-D use, due to grape sensitivity. Also **DO NOT** apply where spray drift may occur to food, forage, or other plantings that might be damaged or rendered unfit for sale, use or consumption. Additionally, there are sensitive crop registries, such as **DriftWatch.org**, that applicators may consult.
- 3. Buffer requirements.** Downwind buffers are required when making applications near sensitive areas. Applicators must maintain a **30 foot downwind buffer** from any area, except roads, planted agricultural fields that don't include susceptible plants, fields that have been prepared for planting, and areas covered by a footprint of a building. Downwind buffers must be maintained until the wind is blowing away from the sensitive area.
- 4. Wind speed.** The label states do not apply when wind speeds are greater than 15 mph, ideally applications would be made when the wind speed is below **10 mph**.
- 5. Temperature inversions.** The labels clearly states **DO NOT apply during a temperature inversion**. Under a temperature inversion the atmosphere is very stable and vertical air mixing is restricted. Herbicide particles can be trapped in the stable air and then move unpredictably when wind movement finally occurs. Temperature inversions occur when the air temperature at the earth's surface begins to cool and warmer air is trapped above it. Temperature inversions often begin at sunset and continue into morning. Ground fog is often a good indicator of a temperature inversion, however fog is not always present during an inversion. New phone apps, such as Pocket Spray Smart, can be used to determine if a temperature inversion exists.
- 6. Rain free interval.** Additional label restrictions include: **DO NOT apply** *Enlist One* and *Enlist Duo* when rain is expected within 24 hours of application. This also includes the use of irrigation within **24 hours** after application. This restriction is to help prevent the movement of 2,4-D in runoff water after heavy rainfall events.
- 7. Tank-mixtures and spray additives.** Only approved spray additives and herbicides can be tank mixed with *Enlist One* and *Enlist Duo*. The list of these approved products are found at **EnlistTankmix.com**. This website is part of the label and should be read within 7 days prior to making the application. Tank mixing any products not listed on the website is a direct violation of the label.

Mixing compatibility issues have occurred when *Enlist One* or *Enlist Duo* have been tank mixed with the potassium salt of glyphosate (i.e., *Roundup PowerMAX 3*). These issues have occurred when both products have been poured into sprayer inductor tanks or have been mixed

with low volumes of water. To overcome these mixing issues higher volumes of water (15 GPA) should be used to get the products into solution.

#### 8. **Sprayer application requirements.**

- **Nozzles:** Nozzle section is based on reducing off-target movement by lowering the amount of fines from the spray droplet spectrum. **Only approved nozzles** can be used. Consult the *Enlist One* and *Enlist Duo* labels for approved nozzles and spray pressures.
- **Spray volume.** Applications should be made at a minimum of **10-15 GPA** (gallons of spray solution per acre).
- **Boom height.** There is no requirement for boom height. However, it is important to use the minimum boom height suggested by the manufacturer to reduce the potential for off-target movement. Research has shown by simply reducing the boom height from 48 to

24 inches the travel distance of drift particles can be reduced by 50%. Slower travel speeds will also help keep the boom level at this lower height.

#### **Additional Recommendations:**

**Follow label recommendations.** While the above is a synopsis of the label restrictions and guidelines, applicators of these products **must read the label and check the respective label websites** prior to making *Enlist One* and *Enlist Duo* applications. Violations of any of these restrictions increases the chances for off-target movement and damage to susceptible species. Not following the label is a direct violation of state and federal law. Remember it is the responsibility of the applicator to protect sensitive areas and crops from off-target movement.

## TABLE 2I – Weed Control in Roundup Ready 2 Xtend (Dicamba and Glyphosate-Resistant) and XtendFlex (Dicamba, Glufosinate, and Glyphosate-Resistant) Soybean

**ROUNDUP READY 2 XTEND RECOMMENDATIONS:** Roundup Ready 2 Xtend soybean varieties can withstand both preemergence and postemergence applications of registered dicamba products and glyphosate. With that being said, one application of a registered dicamba product (*XtendiMax* or *Engenia*), a dicamba premixture (*Tavium* = dicamba + *Dual Magnum*) or glyphosate alone will not consistently provide season-long weed control. When planting Roundup Ready 2 Xtend soybean the following strategy is recommended:

- 1) Soil-applied residual herbicide applied preemergence followed by a registered dicamba product + glyphosate, glyphosate tank-mixed with herbicides that are normally tolerant to soybean, or glyphosate alone applied postemergence. In no-till situations, *XtendiMax*, *Engenia*, or *Tavium* can be included in the burndown. Refer to Table 2P for more information.
  - a) Preemergence herbicide options can be found in Table 2A.
  - b) If using glyphosate postemergence, refer to Table 2E for specific information and restrictions. Remember, glyphosate will not control glyphosate (Group 9)-resistant weeds.
  - c) If using *XtendiMax*, *Engenia*, or *Tavium* postemergence, refer to specific information and restrictions below and on the following factsheet, “*Guidelines and Precautions for Dicamba Use in Roundup Ready 2 Xtend and XtendFlex Soybean*”.
  - d) Early canopy closure from planting soybean in narrow rows will help improve season-long weed control.
  - e) In addition, several soil-applied residual herbicides can be tank-mixed with postemergence herbicide applications for extended residual control. Check the remarks and limitations of residual herbicides to determine which ones can be used postemergence. Tank-mixtures with some residual herbicides may cause temporary burn or discoloration.

**XTENDFLEX RECOMMENDATIONS:** In addition to dicamba and glyphosate resistance, *XtendFlex* soybean are resistant to glufosinate (i.e., *Liberty*). Similar to other herbicide-resistant soybean varieties, one application of a postemergence herbicide will not provide consistent season-long weed control. For improved, more consistent weed control the following strategy is recommended:

- 1) Soil-applied residual herbicide applied preemergence followed by glufosinate (i.e., *Liberty*), glyphosate, a registered dicamba product + glyphosate, or other labeled tank-mixtures applied postemergence. In no-till situations, *XtendiMax*, *Engenia*, or *Tavium* can be included in the burndown. Refer to Table 2P for more information.
  - a) Preemergence herbicide options can be found in Table 2A.
  - b) If using glufosinate (i.e., *Liberty*) postemergence, refer to Table 2F for specific information and restrictions.
  - c) If using glyphosate postemergence, refer to Table 2E for specific information and restrictions. Remember, glyphosate will not control glyphosate (Group 9)-resistant weeds.
  - d) If using *XtendiMax*, *Engenia*, or *Tavium* postemergence, refer to specific information and restrictions below.
  - e) Early canopy closure from planting soybean in narrow rows will help improve season-long weed control.
  - f) In addition, several soil-applied residual herbicides can be tank-mixed with postemergence herbicide applications for extended residual control. Check the remarks and limitations of residual herbicides to determine which ones can be used postemergence. Tank-mixtures with some residual herbicides may cause temporary burn or discoloration.
  - g) An additional application of glufosinate (i.e., *Liberty*), or glyphosate can be applied if needed.

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## Weed Control in Roundup Ready 2 Xtend and XtendFlex Soybean (continued)

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
Annual and perennial broadleaves	dicamba ( <i>Engenia</i> ) OR ( <i>XtendiMax</i> )	0.5 a.e.	12.8 oz 5L OR 22 oz 2.9L	<ul style="list-style-type: none"> <li>• <b>APPLY TO ROUNDUP READY 2 XTEND OR XTENDFLEX SOYBEAN ONLY.</b></li> <li>• Roundup Ready 2 Xtend soybean are resistant to glyphosate and dicamba. XtendFlex are resistant to glyphosate, glufosinate, and dicamba.</li> <li>• <b><i>Engenia</i> and <i>XtendiMax</i></b> are the only dicamba formulations that are registered for use in Roundup Ready Xtend or XtendFlex soybeans and are <b>Restricted Use Pesticides</b>.</li> <li>• Can be applied <b>preplant, preemergence, or post-emergence</b> up to and including June 30. <i>XtendiMax</i> applications occurring after R1 are prohibited.</li> <li>• Apply to broadleaf weeds that are less than 4-inches in size.</li> <li>• A short period of residual activity on certain small-seeded broadleaf weeds is possible. However, this is dependent on weather conditions.</li> <li>• Refer to Table 2B for postemergence weed control and crop tolerance ratings.</li> <li>• Refer to Table 2Q for information on preplant and preemergence burndown uses in no-till Roundup Ready 2 Xtend and XtendFlex soybean.</li> <li>• <i>Engenia</i>: DO NOT apply more than a total of 25.6 oz/A postemergence, and a total of 51.2 oz/A for all applications.</li> <li>• <i>XtendiMax</i>: DO NOT apply more than 22 oz/A in a single application, or more than a total of 44 oz/A preemergence or postemergence for a total of 88 oz/A for all applications.</li> <li>• DO NOT mix any other herbicides or additives with any of these dicamba products unless they are approved on the following websites:  <div style="text-align: center;"> <a href="http://engeniatankmix.com">engeniatankmix.com</a>  <a href="http://xtendimaxapplicationrequirements.com">xtendimaxapplicationrequirements.com</a> </div> </li> <li>• The inclusion of a volatility reduction agent (VRA)/buffering agent (pH modifier) and a drift reduction agent (DRA) are required unless otherwise indicated, see application requirement websites.</li> <li>• Several broadleaf plants including non-Xtend soybean are extremely susceptible to dicamba.</li> <li>• CAUTION should be taken to avoid spray system contamination, vapor and/or spray particle drift.</li> <li>• Specific guidelines for use are <b>required</b> when applying dicamba to Roundup Ready 2 Xtend or XtendFlex soybeans. Information on application guidelines and stewardship to reduce potential off-target movement of these products can be found in the following section, "<b>Guidelines and Precautions for Dicamba Use in Roundup Ready 2 Xtend and XtendFlex Soybean</b>".</li> <li>• Refer to Table 12 for crop rotation restrictions.</li> </ul>

**Weed Control in Roundup Ready 2 Xtend and XtendFlex Soybean (continued)**

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
Annual broadleaves Residual annual Grass control	dicamba + <i>s-metolachlor</i> ( <i>Tavium</i> ) + surfactant	1.5	56.5 oz 3.4L  + 0.25%	<ul style="list-style-type: none"> <li>• <b>APPLY TO ROUNDUP READY 2 XTEND OR XTENDFLEX SOYBEAN ONLY.</b></li> <li>• <i>Tavium</i> is a <b>Restricted Use Pesticide.</b></li> <li>• See Table 2C for individual product rate equivalents for the premix.</li> <li>• Can be applied <b>preplant, preemergence</b>, or <b>postemergence</b> through V4 or June 30 whichever comes first.</li> <li>• Refer to Table 2B for postemergence weed control and crop tolerance ratings.</li> <li>• <i>Tavium</i> will not control emerged grasses, but the <i>Dual Magnum</i> component of this premixture will provide residual control of annual grasses and small-seeded broadleaf weeds.</li> <li>• Refer to Table 2Q for information on preplant and preemergence burndown uses in no-till Roundup Ready 2 Xtend or XtendFlex soybean.</li> <li>• DO NOT make more than one application prior to crop emergence, and/or one in-crop postemergence application. The annual maximum rate of <i>Tavium</i> is 113 oz/A.</li> <li>• DO NOT mix any other herbicides or additives with <i>Tavium</i> unless approved on the following website: <b>www.TaviumTankMix.com</b></li> <li>• The inclusion of a volatility reduction agent (VRA)/buffering agent (pH modifier) and a drift reduction agent (DRA) are required unless otherwise indicated, see application requirement websites.</li> <li>• Specific guidelines for use are required when applying dicamba products (i.e., <i>Tavium</i>) to Roundup Ready 2 Xtend or XtendFlex soybeans. Information on application guidelines and stewardship to reduce potential off-target movement of these products can be found in the following section, "<b>Guidelines and Precautions for Dicamba Use in Roundup Ready 2 Xtend and XtendFlex Soybean</b>".</li> <li>• Refer to Table 12 for crop rotation restrictions.</li> </ul>

# Guidelines and Precautions for Dicamba Use in Roundup Ready 2 Xtend and XtendFlex Soybean

The Roundup Ready 2 Xtend system in soybean was developed as a tool to help manage herbicide-resistant weeds. This system enabled growers to apply registered dicamba formulations to soybean designated as Roundup Ready 2 Xtend. In addition to dicamba resistance these soybeans are also resistant to glyphosate. As glyphosate- and multiple-resistant weeds increase in Michigan, growers have the option to use the Roundup Ready 2 Xtend system to manage these resistant weeds. In 2021, the second generation of dicamba-resistant soybean, XtendFlex soybean, was made available. XtendFlex soybean are not only resistant to registered dicamba formulations and glyphosate, but they are also resistant to glufosinate (i.e., *Liberty*). Regardless of what herbicide is applied, it is important to keep in mind that every application increases the selection for herbicide-resistance. If a grower decides to use either one of these technologies, it will be important to use integrated approaches to control problematic and resistant weeds. An overreliance on any single herbicide site of action will lead to the development of new herbicide-resistant weeds.

Only lower volatility dicamba formulations are registered for use in Roundup Ready 2 Xtend and XtendFlex soybean. The labels of these products are very detailed on how to protect sensitive/susceptible species and crops from off-target dicamba movement. However, in areas with high use of dicamba in the first five years of the Xtend system there have been complaints of off-target movement that injured susceptible species in the United States. Some of these instances occurred because applicators took some of the label restrictions too lightly and did not follow the label when making applications. Some of these violations included not using the correct nozzles, spraying in too high of winds or during temperature inversions, not following the buffer requirements or tank mixture restrictions, and spraying when the wind was blowing toward susceptible crops. Improper sprayer and tank cleanout also lead to damage of susceptible crops. Other instances included dicamba movement in runoff waters following heavy rains and, in some instances, off-target movement could not easily be explained, leading some to believe dicamba volatility was occurring.

After cancellations in June 2020 of dicamba products registered for use in Xtend soybean, the EPA granted new 5-year registrations on October 27, 2020. These registrations were accompanied by several label changes and clarifications to address potential off-target injury to sensitive surrounding crops and plants.

Below is a synopsis of significant guidelines including new label changes that must be followed if a grower decides to use dicamba in Roundup Ready 2 Xtend or XtendFlex soybean. Remember it is the responsibility of the applicator to protect sensitive areas and susceptible crops from dicamba injury.

## Label Guidelines and Restrictions:

- 1. Use only approved dicamba products.** Currently, *Engenia*, *Tavium*, and *XtendiMax* are the only dicamba products registered for preplant, preemergence, or postemergence use in Roundup Ready 2 Xtend or XtendFlex soybean. **Use of other dicamba formulations is a violation of state and federal law.**
- 2. The dicamba products *Engenia*, *Tavium*, and *XtendiMax* are Restricted Use Pesticides.** Unlike other Restricted Use Pesticides, **only certified applicators** can purchase and apply dicamba over-the-top of soybean. Those working under a certified applicator can no longer make these applications.
- 3. Dicamba or auxin-specific training is required.** As part of the federal labels for *Engenia*, *Tavium*, and *XtendiMax*, applicators are required to attend dicamba or auxin-specific (Group 4) training prior to using these products. This training is **mandatory** on an **annual basis**.
- 4. Record keeping of all dicamba applications and spray system cleanout is required.** Records must be generated within **72 hours** of application and kept for **2 years**. The full record keeping requirements are listed on the label. Additionally, specific sprayer and tank cleanout procedures are listed on the label.
- 5. Wind direction.** There is a strict requirement on the approved dicamba labels that states that dicamba should not be applied if the wind is blowing towards adjacent susceptible/sensitive crops. What this really means is that if you are in the **vicinity of a susceptible/sensitive crop and the wind is blowing toward that crop DO NOT spray dicamba**. Susceptible/sensitive crops include, but are not limited to non-dicamba resistant soybean, tomatoes, grapes, dry beans, sugar beets, fruiting trees and vegetables, cucurbits, potatoes, flowers and other broadleaf plants, including greenhouse plants. Currently, there is not an exact distance listed on the label between where the dicamba application is being made in relation to the adjacent susceptible/sensitive crop. However, realistically if you can see the susceptible/sensitive crop or if it is within 0.5 mile and the wind is blowing in that direction DO NOT apply dicamba until the wind is blowing away from that susceptible/sensitive crop. Additionally, there are sensitive crop registries, such as **DriftWatch.org**, that applicators must consult.
- 6. Buffer requirements.** The applicator must always **maintain a 240-foot downwind buffer** between the last treated row and the nearest downwind field edge. The following areas may be included in the buffer distance composition when directly adjacent to the treated field edges: roads, mowed grassy, and bare ground areas. Planted agricultural fields containing corn, dicamba-



resistant soybean, small grains, or crops where dicamba is approved for postemergence use. A **new 310-foot downwind buffer** and **57-foot omnidirectional buffer** is also required in counties where **endangered species** exist.

7. **Wind speed.** The label states dicamba applications can only be made when the wind speed is between **3** and **10 mph**. Temperature inversions often exist when the wind speed is less than 3 mph, which can lead to unpredictable off-target movement. Wind speeds above 10 mph increase the chances for particle drift. Applicators also need to be aware of wind gusts. If wind gusts exceed 10 mph it is strongly recommended not to apply dicamba.
8. **Temperature inversions.** The labels clearly state **DO NOT apply** these products **during a temperature inversion**. Under a temperature inversion the atmosphere is very stable and vertical air mixing is restricted. Herbicide particles can be trapped in the stable air and then move unpredictably when wind movement finally occurs. Temperature inversions occur when the air temperature at the earth's surface begins to cool and warmer air is trapped above it. Temperature inversions often begin at sunset and continue into morning. Ground fog is often a good indicator of a temperature inversion; however, fog is not always present during an inversion. That is one reason for the wind speed and new time of day restrictions. New apps, such as Pocket Spray Smart, can be used to determine if a temperature inversion exists.
9. **Time of day.** The new labels now only allow for applications between **1 hour after sunrise** and **2 hours before sunset**. Again, this is to avoid applications during times when temperature inversions are likely to occur.
10. **Rain free interval.** Additional label restrictions include: DO NOT apply dicamba if soil is saturated with water or when rainfall that may exceed soil field capacity is forecasted to occur within **48 hours**. This restriction is to help prevent the movement of dicamba in runoff water after heavy rainfall events.
11. **Tank-mixtures and spray additives.** Only approved spray additives and herbicides can be tank mixed with approved dicamba products. **New requirements** include the inclusion of a **volatility reduction agent (VRA)**/ buffering agent (pH modifier). The list of these approved products is found on the respective dicamba products websites and change frequently. Many tank mixtures require the addition of a drift reduction agent (DRA), these requirements can be found on the label websites. These websites are part of the label and should be read within 7 days of making the application. The tank mixing of any products not listed on the websites is a direct violation of the label. Finally, **DO NOT add ammonium sulfate** or any products containing ammonium sulfate. The addition of ammonium sulfate and unapproved products increases the volatility of dicamba.

Approved dicamba label websites:

**engeniataankmix.com**  
**xtendimaxapplicationrequirements.com**

## 12. Sprayer application requirements.

- **Nozzles:** Nozzle section is based on reducing off-target movement by lowering the number of fines from the spray droplet spectrum. **Only approved nozzles** can be used. Consult the approved dicamba product websites for approved nozzles and spray pressures.
- **Spray volume.** Applications must be made at a minimum of **15 GPA** (gallons of spray solution per acre).
- **Travel speed.** The maximum travel speed when applying approved dicamba products is **15 mph**.
- **Boom height.** The requirement on the label is to keep the boom height **24 inches** or less above the target pest or crop canopy. It is important to keep the boom close to this height to minimize the potential for off-target movement. Research has shown by simply reducing the boom height from 48 to 24 inches the travel distance of drift particles can be reduced by 50%. The slower travel speed mentioned above will help with keeping the boom level at this lower height.

## Additional Recommendations:

1. **Follow label recommendations.** While the above is a synopsis of the label restrictions and guidelines, applicators of these products **must read the label and check the respective label websites** prior to making dicamba applications. Violations of any of these restrictions increases the chances for off-target movement and damage to susceptible species. Not following the label is a direct violation of state and federal law. Remember it is the responsibility of the applicator to protect sensitive areas and crops from off-target movement.
2. **Consider applying dicamba only preplant, preemergence or very early postemergence.** Over 90% of the off-target dicamba movement complaints occurred from postemergence applications. Postemergence applications have the greatest potential for coming into contact with susceptible vegetation. The new label **prohibits** over-the-top applications of dicamba after **June 30<sup>th</sup>**. This cutoff date may help reduced the number of off-target injury complaints that tend to occur from late-season applications. Additionally, applications later in the season will likely occur under higher temperatures, which may impact off-target movement. While there is not a strict temperature cutoff on the label, our recommendations are to avoid applications when temperatures exceed 80° F. If there is a possibility of volatility with some of these new lower volatility formulations it would likely increase with temperature.
3. **Communicate with neighbors.** It is important to have conversations with your neighbors to know what crops and technologies are being planted near your Roundup Ready 2 Xtend or XtendFlex soybean fields. In the past, off-target movement of dicamba to non-Xtend soybeans

most frequently happened when neighbors planted Xtend soybeans next to non-Xtend fields. Communication prior to planting may have helped resolve some of these issues. Additionally, one of Michigan's agricultural strengths is its diversity. In order to maintain this strength, we need to insure that our specialty crops are protected. Many of Michigan's specialty crops are susceptible to dicamba and do not have maximum residue limits (MRLs) established. Meaning if off-target movement occurs, these crops cannot be marketed and will need to be destroyed. The applicator will be responsible for the total loss of these crops. ***This is especially serious in perennial crops, such as vineyards, fruit trees, and orchards, where damage from dicamba will result in severe economic losses.***

## TABLE 2J – Soybean – Preharvest Applications

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
Annual grasses Annual broadleaves Perennial weeds	glyphosate + ammonium sulfate	0.75–3.6 lb a.e.	See Table 10 + 17 lb/100 gal	<ul style="list-style-type: none"> <li>• See Table 10 for a list of glyphosate products, formulations and rates.</li> <li>• Apply to mature soybeans once pods have lost their color.</li> <li>• DO NOT apply to soybeans grown for seed.</li> <li>• Roundup Ready soybean: The maximum preharvest use rate is 0.75 lb a.e./A of glyphosate with a 14 day preharvest interval.</li> <li>• <i>non-Roundup Ready soybean</i>: The rate range is from 0.75 to 3.6 lb a.e./A (equivalent to 20 fl oz/A up to 3 qt/A of Roundup <i>PowerMAX 3</i>) of glyphosate with a 7 day preharvest interval.</li> <li>• Apply in 10-40 gal of water.</li> <li>• Apply 0.75 lb a.e./A for annual weeds.</li> <li>• Consult glyphosate product label for specific rate needed for perennial weeds in non-Roundup Ready crops.</li> </ul>
Annual grasses Annual broadleaves	paraquat ( <i>Gramoxone SL 2.0</i> ) OR ( <i>Gramoxone SL 3.0</i> ) + surfactant	0.25	16 oz 2SL  OR 10.7 oz 3SL + 0.25%	<ul style="list-style-type: none"> <li>• <b>Gramoxone is a restricted-use pesticide.</b> Certified applicators are now required to complete a paraquat specific training prior to use of <i>Gramoxone</i>. The paraquat training course can be found online at: <a href="http://www.epa.gov/pesticide-worker-safety/paraquat-dichloride-training-certified-applicators">www.epa.gov/pesticide-worker-safety/paraquat-dichloride-training-certified-applicators</a>.</li> <li>• Indeterminate varieties: Apply when at least 65% of pods are mature brown (seed moisture less than 30%).</li> <li>• Always add a non-ionic surfactant at 0.25% v/v.</li> <li>• Immature soybeans will be injured.</li> <li>• Do not apply within 15 days of harvest.</li> <li>• Apply <i>Gramoxone SL</i> in 20 gal. water (ground) or 5 gal. water (air).</li> </ul>
	paraquat ( <i>Parazone</i> ) + surfactant	0.25	10.7 oz 3SL + 0.25%	<ul style="list-style-type: none"> <li>• <b>Parazone is a restricted-use pesticide.</b> Certified applicators are now required to complete a paraquat specific training prior to use of <i>Parazone</i>. The paraquat training course can be found online at: <a href="http://www.epa.gov/pesticide-worker-safety/paraquat-dichloride-training-certified-applicators">www.epa.gov/pesticide-worker-safety/paraquat-dichloride-training-certified-applicators</a>.</li> <li>• <i>Parazone</i> contains the same active ingredient as <i>Gramoxone SL</i> (paraquat), but at a different concentration.</li> <li>• See the Remarks and Limitations section for <i>Gramoxone SL 3.0</i>.</li> </ul>
Annual broadleaves	carfentrazone-ethyl ( <i>Aim</i> ) + methylated seed oil	0.02	1.5 oz 2EC + 1%	<ul style="list-style-type: none"> <li>• Apply to mature soybeans once pods have lost their color.</li> <li>• Do not apply within 3 days of harvest.</li> <li>• <i>Aim</i> is not as effective as glyphosate or <i>Gramoxone</i> on most species.</li> <li>• <i>Aim</i> at 1 oz/A can be applied with glyphosate or <i>Gramoxone</i> to broaden the spectrum of weed control over <i>Aim</i> alone.</li> <li>• Use a minimum of 10 gal of water. Higher spray volumes would provide better coverage.</li> </ul>
	dicamba ( <i>Clarity</i> )	0.25	8 oz 4L	<ul style="list-style-type: none"> <li>• Apply when soybean pods have reached a mature brown color and at least 75% leaf drop has occurred.</li> <li>• <i>Clarity</i> can be used to suppress annual weeds, higher rates up to 32 oz/A can be applied to suppress biennial, or perennial weeds (consult label).</li> <li>• Apply up to 7 days before harvest.</li> <li>• DO NOT apply to soybean grown for seed.</li> <li>• Caution should be taken to avoid vapor and particle spray drift.</li> <li>• <i>Clarity</i> is not recommended as a preharvest interval if you are planning on planting winter wheat.</li> <li>• Refer to label and Table 12 for crop rotation restrictions. DO NOT include time in the rotation interval when the ground is frozen.</li> </ul>

(Continued on next page)

## Soybeans – Preharvest Application *(continued)*

Weed Controlled	Herbicide	Rate lb/A a.i.	Formulation/A	Remarks and Limitations
<i>(continued)</i>				
<b>Annual broadleaves</b>	saflufenacil <i>(Sharpen)</i> + methylated seed oil + ammonium sulfate	0.023	1 oz 2.85L  + 1% + 17 lb/100 gal	<ul style="list-style-type: none"> <li>• Apply when crop is mature – greater than 65% brown pods and greater than 70% leaf drop or when seed moisture is 30% or less.</li> <li>• <i>Sharpen</i> can be applied at rates up to 2 oz/A.</li> <li>• Soybeans can be harvested 3 days after application. However, it generally takes 7-10 days to reach maximum desiccation activity.</li> <li>• <i>Sharpen</i> is an effective desiccant.</li> <li>• DO NOT apply to soybeans grown for seed.</li> <li>• DO NOT graze or feed desiccation-treated hay or straw to livestock.</li> <li>• Refer to label and Table 12 for crop rotation restrictions. DO NOT include time in the rotation interval when the ground is frozen.</li> </ul>

**TABLE 2K – Maximum Broadleaf Weed Heights for Postemergence Control in Soybean\***

Herbicide	RATE/A	COCKLEBUR	JIMSONWEED	LAMBSQUARTERS	NIGHTSHADE (E. BLACK)	PALMER AMARANTH <sup>d</sup>	PIGWEEED	RAGWEED (COMMON)	RAGWEED (GIANT)	SMARTWEED	VELVETLEAF	WATERHEMP <sup>d</sup>	WILD MUSTARD	HORSEWEED (MARESTAIL)
		WEED HEIGHT <sup>a</sup> (inches)												
Anthem MAXX	3 oz	–	2	2	2 <sup>c</sup>	–	2 <sup>c</sup>	–	–	2 <sup>c</sup>	36	2	–	–
Basagran	1.5 pt (4L) or 1.2 pt (5L)	6	6	1.5 <sup>c</sup>	–	–	–	–	–	6	2	–	4	–
	2 pt (4L) or 1.6 pt (5L)	10	10	2 <sup>c</sup>	–	–	–	3	6	10	6	–	8	–
Cadet	0.6 oz	–	2	2	2	–	2	–	–	–	36	2	–	–
	0.9 oz	–	2	2	2	–	4	–	–	–	36	2	–	–
Classic	0.5 oz	6	4	–	–	–	2	–	–	2	–	–	4	3
	0.75 oz	12	6	–	–	–	4	4	6	4	6	–	6	6
Cobra <sup>b</sup>	8 oz	3	3	–	4	–	3	–	–	–	–	–	–	–
	10 oz	4	4	–	4	2	4	2	–	–	–	2	–	–
	12.5 oz	4	4	–	5	3	4	4	2	–	–	3	–	–
FirstRate	0.3 oz	10	4	–	–	–	–	8	10	6	6	–	4	6
Flexstar <sup>b</sup>	0.75 pt	2L	4L	–	2L	2L	2L	–	–	–	–	–	4L	–
	1 pt	4L	6L	–	4L	4L	4L	4L	4L	4L	–	2L	6L	–
Harmony SG	0.12 oz	–	–	4	–	–	12	–	–	6	6	–	4	–
Marvel	7.25 oz	–	4	4	4	3	4	3	–	4	36	4	4	–
Perpetuo	6 oz	4L <sup>c</sup>	4L <sup>c</sup>	3L <sup>c</sup>	–	4L <sup>c</sup>	3L <sup>c</sup>	3L <sup>c</sup>	–	–	6L	–	–	–
Prefix <sup>b</sup>	2 pt	–	4L	–	2L	4L	2L	4L	–	4L	–	2L	4L	–
Pursuit	4 oz	8	3	<1 <sup>c</sup>	2	–	6	2 <sup>c</sup>	3 <sup>c</sup>	3	2	–	3	–
Raptor	5 oz	8	6	3	3	–	6	3	4	4	4	–	3	–
Reflex <sup>b</sup>	0.75 pt	–	2L	–	2L	–	2L	2L	–	2L	–	–	2L	–
	1 pt	–	4L	–	2L	4L	2L	4L	–	4L	–	2L	4L	–
Resource	6 oz	–	–	3L <sup>c</sup>	–	–	3L <sup>c</sup>	4L <sup>c</sup>	–	–	6L	–	–	–
Synchrony XP	0.5 oz	8	5	4	–	–	8	4	4	8	8	–	5	5
Ultra Blazer	1 pt	–	4	–	<2	4	<4	2	<2	4	–	4	<4	–
	1.5 pt	2	6	2 <sup>c</sup>	2	4	4	3	3	6	–	4	4	–
Varisto	21 oz	4	4	1.5	3	–	3	–	–	4	3	–	3	–
	27 oz	8	6	5	3	–	4	3	3	6	3	–	3	–
Warrant Ultra <sup>b</sup>	3 pt	–	4L	–	2L	4L	2L	4L	–	4L	–	2L	4L	–
<b>GLYPHOSATE-RESISTANT SOYBEAN</b>														
Glyphosate	1.13 lb a.e.	6	6	6	6	–	6	6	6	6	6	–	6	6
Extreme	3 pt	18	6	8	12	–	18	9	9	6	5	–	18	12

(Continued on next page)

**TABLE 2K – Maximum Broadleaf Weed Heights for Postemergence Control in Soybean\* (continued)**

<i>Herbicide</i>	RATE/A	COCKLEBUR	JIMSONWEED	LAMBSQUARTERS	NIGHTSHADE (E. BLACK)	PALMER AMARANTH <sup>d</sup>	PIGWEEED	RAGWEED (COMMON)	RAGWEED (GIANT)	SMARTWEED	VELVETLEAF	WATERHEMP <sup>d</sup>	WILD MUSTARD	HORSEWEED (MARESTAIL)
		WEED HEIGHT <sup>a</sup> (inches)												
Flexstar GT 3.5	3.5 pt	4	4	4	4	1	4	4	4	4	4	2	6	–
Sequence	2.5 pt	12	12	6	6	–	12	12	12	6	6	–	18	12
<b>GLUFOSINATE-RESISTANT (LL) SOYBEAN</b>														
Liberty/Cheetah/Interline/Noventa	32 oz	14	10	6	8	4	4	10	12	14	4	5	6	6-12
Cheetah Max	1 qt	14	10	6	8	4	4	10	12	14	4	5	6	6
<b>ENLIST E3 SOYBEAN</b>														
Enlist One	2 pt	6	6	6	6	6	6	6	6	6	6	6	6	6
Enlist Duo	4.75 pt	6	6	6	6	6	6	6	6	6	6	6	6	6
<b>XTEND and XTENDFLEX (DICAMBA-RESISTANT) SOYBEAN</b>														
Engenia	12.8 oz	4	4	4	4	4	4	4	4	4	4	4	4	4
XtendiMax	22 oz	4	4	4	4	4	4	4	4	4	4	4	4	4
Tavium	56.5 oz	4	4	4	4	4	4	4	4	4	4	4	4	4

\* The weed heights listed on this table are estimates of the maximum size where consistent control is expected. The maximum height for effective control in any specific situation is dependent on environmental conditions, including soil moisture, temperature, and relative humidity.

<sup>a</sup> (–) No control or weed height not listed on label.

<sup>b</sup> Weed stages are based on maximum leaf numbers.

<sup>c</sup> Suppression only.

<sup>d</sup> Almost all populations of Palmer amaranth and waterhemp found in Michigan are resistant to the ALS-inhibiting herbicides (Group 2) and glyphosate (Group 9).

## TABLE 2L – Suggested Additives for Postemergence Herbicide Applications in Soybean<sup>a</sup>

Herbicide	Crop Oil Concentrate (COC)	OR	Nonionic Surfactant (NIS)	AND/OR	28% liquid nitrogen (28%N) or ammonium sulfate (AMS)
Anthem MAXX	1%		0.25%		28% N (1-2 qt/A) or AMS (2.5 lb/A) optional
Assure II/Targa	1% (2% if drought stress)		0.25%		NO
Basagran <sup>b</sup>	1 qt/A		NO		28% N (2-4 qt) or AMS (2.5 lb/A) optional
Cadet	1 qt/A		0.25%		28% N (2.5%) or AMS (2 to 2.5 lb/A) optional
Classic <sup>b</sup>	1%		0.25%		28% N (2-4 qt) or AMS (2-4 lb/A)
Cobra	0.5%		0.25% if high RH		28% N (2.5%) or AMS (2-4 lb/A)
FirstRate <sup>b</sup>	1.2% if dry only		0.25%		Always add 28% N (2.5%) or AMS (8.5-17 lb/100 gal)
Flexstar	1%		0.25%		28% N (2.5%) or AMS (8.5 lb/100 gal) optional
Fusilade DX	0.5-1%		0.25-0.5%		28%N (2.5%) or AMS (17 lb/100 gal) optional
Harmony <sup>b</sup>	1% if hot, dry only		0.125–0.25%		28% N (2 qt/A) or AMS (2-4 lb/A) optional
Marvel	1%		0.25%		28% N (1-2 qt/A) or AMS (2.5 lb/A) optional
Perpetuo	1%		NO		28%N (1 gal/A) or AMS (2.5 lb/A)
Poast <sup>d</sup> or Poast Plus	1 qt/A		NO		28% N (0.5-1 gal/A) or AMS (2.5 lb/A) optional
Prefix	NO		0.25%		
Pursuit	1%		0.25%		Always add 28% N (2.5%) or AMS (12-15 lb/100 gal)
Raptor <sup>e</sup>	1%		0.25%		Always add 28% N (2.5%) or AMS (12-15 lb/100 gal)
Reflex	0.5–1%		0.25–0.5%		28% N (2.5%) or AMS (10 lb/100 gal) optional
Resource	1 qt/A		NO		28% N (1 gal/A) or AMS (2.5 lb/A) optional
Select/Arrow	1%		NO		28% N (1-2 qt/A) or AMS (17 lb/100 gal) optional
Select Max	1%		0.25%		28% N (1 to 2 qt/A) or AMS (2.5 to 4 lb/A) optional
Synchrony XP	1%		0.25% non-STS beans		Always add 28% N (2 qt) or AMS (2 lb/A)
Ultra Blazer	NO		0.25%		28% N (2-4 qt/A) or AMS (2.5 lb/A) optional
Varisto	1%		0.25% <sup>e</sup>		Always add 28%N (2.5%) or AMS (12-15 lb/100 gal)
Warrant Ultra	1% <sup>g</sup>		0.25-0.5%		
<b>GLUFOSINATE-RESISTANT (LL) SOYBEAN</b>					
Glyphosate <sup>c</sup>	NO		Consult Table 10		AMS (17 lb/100 gal)
Extreme	NO		0.125%		AMS (17 lb/100 gal)
Flexstar GT 3.5	NO		0.25%		AMS (17 lb/100 gal)
Sequence	NO		NO		AMS (17 lb/100 gal)
<b>GLUFOSINATE-RESISTANT (LL) SOYBEAN</b>					
Liberty/Cheetah/Interline/Noventa	NO		NO		AMS (8.5 to 17 lb/100 gal) <sup>f</sup>
Cheetah Max	NO		NO		AMS (8.5-17 lb/100 gal) <sup>f</sup>
<b>ENLIST E3 SOYBEAN</b>					
Enlist One	Consult label		Consult label		Consult label
Enlist Duo	Consult label		Consult label		Consult label
<b>ROUNDUP READY 2 XTEND OR XTENDFLEX (DICAMBA-RESISTANT) SOYBEAN</b>					
Engenia	Consult label		Consult label		NO
XtendiMax	Consult label		Consult label		NO
Tavium	Consult label		Consult label		NO

<sup>a</sup> 0.125% = 1 pt in 100 gal of spray solution; 0.25% = 1 qt in 100 gal; 1% = 1 gal in 100 gal; 4% = 4 gal in 100 gal.

<sup>b</sup> 28% N or AMS should be added for velvetleaf control.

<sup>c</sup> Consult Table 10 for glyphosate formulations and NIS requirements.

<sup>d</sup> 28% N or AMS improves control of large crabgrass, quackgrass, and volunteer corn and cereals.

<sup>e</sup> Use methylated seed oil (MSO) for improved common ragweed control.

<sup>f</sup> Use 8.5 lb/100 gal under hot, humid conditions.

<sup>g</sup> Greater crop response.

## TABLE 2M – Additives for Postemergence Broadleaf Tank Mixtures in Soybean

Additives are listed for each herbicide tank mixture based on the label of the herbicide in the Primary Herbicide column. Sometimes, a tank mixture may occur on only one label. For example, *Basagran + Classic* is listed as a tank mixture on the *Basagran* label but is not listed as a tank mixture on the *Classic* label. To find the correct additives for a tank mixture, find the first herbicide in the Primary Herbicide column and then move across the column to the box that corresponds with the tank mix partner.

PRIMARY HERBICIDE	TANK MIX PARTNER											
	BASAGRAN	CLASSIC	COBRA	FIRSTRATE	FLEXSTAR	HARMONY	PURSUIT	RAPTOR	REFLEX	RESOURCE	SYNCHRONY XP	ULTRA BLAZER
Basagran	–	A+	B+	A+	B+	A+	B+	B+	B+	B+	B+	B+
Cadet	B+	B+	D–	A+	B+	C+	B+	B+	B+	B+	C+	A
Classic	NL	–	D+	B+	B+	C+	D+	NL	B+	NL	NL	A+
Cobra <sup>1</sup>	D–	D–	–	D+	NL	C–	D+	D+	NL	B–	D–	NL
FirstRate <sup>2</sup>	A+	A+	A+	–	A+	A+	A+	A+	A+	A+	A+	A+
Flexstar <sup>2</sup>	B+	B+	NL	A+	–	C+	B+	B+	NL	B+	B+	NL
Harmony	A+	NL	NL	NL	NL	–	NL	NL	NL	NL	NL	NL
Pursuit	B+	NL	D+	A+	B+	A+	–	NL	B+	NL	NL	A+
Raptor	B+	A–	D+	A+	B+	NL	NL	–	B+	NL	NL	B+
Reflex <sup>2</sup>	B+	B+	NL	A+	NL	C+	B+	B+	–	B+	B+	NL
Resource	B+	B+	B–	B+	B+	C+	B+	B+	NL	–	B+	B+
Synchrony XP <sup>3</sup>	NL	NL	D+	B+	B+	NL	NL	NL	B+	NL	–	A+
Ultra Blazer	A–	A–	NL	A+	NL	C+	A+	A+	NL	B–	D+	–

### Adjuvant

A = 0.25% v/v non-ionic surfactant  
 B = 1.0% v/v crop oil concentrate  
 C = 0.125% v/v non-ionic surfactant  
 D = 0.5% v/v crop oil concentrate  
 NL = Not on label

### Nitrogen Source

– = DO NOT add a N fertilizer source  
 + = Add a N fertilizer sources, AMS or 28% UAN

<sup>1</sup> *Cobra* applied at 4 to 12 oz/A.

<sup>2</sup> These tank mixtures are labeled, adjuvant selection should be based on the tank mix partner label.

<sup>3</sup> Adjuvant selection is when *Synchrony XP* is used on STS designated soybeans.



**TABLE 2N – Application Rates of Postemergence  
Grass Herbicides for Control of Grass Species  
at Various Heights**

	Assure II/ Targa	Fusilade DX	Poast	Poast Plus	Select/ Arrow	Select Max
	oz/A					
<b>Barnyardgrass</b>						
1–2"	–	10	12	18	4	6
2–3"	8	12	12	18	4	6
3–4"	8	–	12	18	4	6
4–6"	8	–	16	24	6	9
6–8"	–	–	16	24	6	9
<b>Crabgrass</b>						
<1"	–	10	–	–	–	–
1–2"	8	12	16	24	6	6
2–6"	8	–	16	24	6	9
<b>Fall Panicum</b>						
1–2"	–	10	12	18	4	6
2–4"	7	12	12	18	4	6
4–6"	7	12	16	24	6	9
6–8"	–	–	16	24	6	9
<b>Giant Foxtail</b>						
1–2"	–	10	12	18	4	6
2–4"	7	12	12	18	4	6
4–6"	7	12	16	24	6	9
6–8"	7	–	16	24	6	9
8–12"	–	–	–	–	6	9
<b>Green Foxtail</b>						
1–2"	–	10	12	18	–	6
2–4"	7	12	12	18	6	6
4–6"	–	–	16	24	6	9
6–8"	–	–	16	24	6	9
<b>Quackgrass</b>						
4–6"	–	10	–	–	8–16+8	12+12
6–8"	10+7	12+8	24+16	36+24	8–16+8	12+12
8–10"	10+7	12+8	–	–	–	12+12
<b>V. Corn</b>						
1–4"	–	–	12	18	–	–
4–6"	–	–	12	18	4	6
6–12"	5	–	12	18	4	6
12–18"	5	6	16	24	6	9
18–20"	8	6	16	24	6	9
20–24"	8	6	–	–	6	9
<b>Witchgrass</b>						
1–2"	–	10	16	24	–	–
2–4"	7	12	16	24	6	9
4–6"	7	–	16	24	6	9
6–8"	–	–	16	24	6	9
<b>Yellow Foxtail</b>						
1–2"	–	10	16	24	–	6
2–4"	7	12	16	24	6	6
4–6"	–	–	16	24	6	9
6–8"	–	–	16	24	6	9

– = Not labeled.

**TABLE 20 – Labeled Tank Mixes With Postemergence Grass Herbicides in Soybean\***

BROADLEAF HERBICIDES <sup>1</sup>	GRASS HERBICIDES					
	Assure II/ Targa	Fusilade DX	Poast	Poast Plus	Select/ Arrow	Select Max
Basagran	Y <sup>3</sup>	Y	Y <sup>4</sup>	Y <sup>4</sup>	Y <sup>5</sup>	Y <sup>5</sup>
Cadet	Y	Y	Y	Y	Y	Y
Classic	Y <sup>3</sup>	Y <sup>3</sup>	Y	Y	Y <sup>5</sup>	Y <sup>5</sup>
Cobra	Y	Y	Y	Y	Y	Y
FirstRate	Y <sup>5</sup>	–	Y <sup>5</sup>	Y <sup>5</sup>	Y <sup>5</sup>	Y <sup>5</sup>
Flexstar	Y	Y	Y	Y	Y	Y
Harmony SG	Y <sup>5</sup>	Y <sup>5</sup>	–	–	–	Y
Marvel	Y	Y	Y	Y	Y	Y
Phoenix	–	–	–	–	Y	Y
Pursuit	–	Y <sup>6</sup>	Y <sup>6</sup>	Y <sup>6</sup>	Y <sup>6</sup>	Y <sup>6</sup>
Raptor	–	–	Y <sup>6</sup>	Y <sup>6</sup>	Y <sup>6</sup>	Y <sup>6</sup>
Reflex	Y	Y	Y	Y	Y	Y
Resource	Y	Y	Y	Y	Y	Y
Synchrony XP	Y <sup>3</sup>	Y	Y	Y	Y <sup>5</sup>	Y <sup>5</sup>
Ultra Blazer	Y	Y	Y	Y	Y	Y
<b>GLYPHOSATE-RESISTANT SOYBEAN</b>						
Glyphosate <sup>2</sup>	Y	Y	Y	Y	Y	Y
Extreme	–	–	–	–	–	–
Flexstar GT 3.5 <sup>2</sup>	Y	Y	Y	Y	Y	Y
Sequence <sup>2</sup>	Y	Y	Y	Y	Y	Y
<b>LIBERTYLINK SOYBEAN</b>						
Liberty/Cheetah/Interline/Noventa	Y	Y	Y	Y	Y	Y

\* Y = the products may be tank mixed; – = tank mix is not legally labeled or recommended.

<sup>1</sup> Tank mixing saves time and application cost but is only labeled for some herbicides and for a limited number of grasses. Consult remarks and limitations for individual products in this guide and pesticide labels for further information.

<sup>2</sup> Volunteer glyphosate-resistant corn. Consult the POST grass herbicide and glyphosate label for correct additives.

<sup>3</sup> DO NOT tank mix when the target grass is barnyardgrass, crabgrass, quackgrass, or yellow foxtail.

<sup>4</sup> DO NOT tank mix if quackgrass is the target species.

<sup>5</sup> Under certain conditions, grass antagonism may occur.

<sup>6</sup> Volunteer corn and shattercane only. Grass antagonism will occur. NOT RECOMMENDED.

## TABLE 2P – Feed and Forage Restrictions for Soybean Herbicides<sup>a</sup>

Herbicides Applied PRE	Site of Action <sup>b</sup>	For Use in Feed/Forage?	Preharvest Interval
Afforia	2/2/14	No	none listed
Anthem Flex	14/15	No	none listed
Anthem MAXX	14/15	No	none listed
Authority Assist	2/14	No	none listed
Authority Edge	14/15	No	none listed
Authority Elite/BroadAxe XC	14/15	<b>Yes</b>	30 days
Authority First/Sonic	2/14	No	65 days
Authority MAXX	2/14	No	none listed
Authority MTZ	5/14	No	120 days
Authority Supreme	14/15	No	none listed
Authority XL	2/14	No	none listed
Boundary	5/15	<b>Yes</b>	75 days
BroadAxe XC	14/15	<b>Yes</b>	30 days
Canopy	2/15	No	none listed
Canopy EX	2/2	No	none listed
Command 3ME	13	No	none listed
Dimetric Charged	14/15	No	none listed
Dual II Magnum/Parallel	15	<b>Yes</b>	75 days
Envive	2/2/14	No	none listed
Fierce EZ	14/15	No	none listed
Fierce MTZ/Kyber	5/14/15	<b>Yes</b>	40 days
Fierce XLT	2/14/15	No	none listed
FirstRate	2	<b>Yes</b>	70 days
Lorox/Linex	7	No	none listed
Metribuzin	5	<b>Yes</b>	none listed
OpTill	2/14	No	85 days
Outlook	15	No	none listed
Prefix	14/15	No	75 days
Prowl H20/Prowl	3	<b>Yes</b>	none listed
Pursuit	2	No	none listed
Python	2	No	none listed
Sharpen	14	<b>Yes</b>	65 days
Sonalan	3	No	none listed
Spartan	14	No	none listed
Spartan Charge	14/14	No	none listed
Surveil	2/14	No	none listed
Trifluralin	3	<b>Yes</b>	none listed
Trivence	2/5/14	No	none listed
Valor/Valor EZ	14	No	none listed
Valor XLT	2/14	No	none listed
Verdict	14/15	No	none listed
Warrant	15	No	none listed

*(Continued on next page)*

**TABLE 2P – Feed and Forage Restrictions  
for Soybean Herbicides<sup>a</sup> (continued)**

<b>Herbicides Applied PRE</b>	<b>Site of Action<sup>b</sup></b>	<b>For Use in Feed/Forage?</b>	<b>Preharvest Interval</b>
Warrant Ultra	14/15	No	none listed
Zidua	15	<b>Yes</b>	none listed
Zidua PRO	2/14/15	No	none listed
Zone Defense	14/14	No	none listed
<b>Herbicides Applied POST</b>	<b>Site of Action<sup>b</sup></b>	<b>For Use in Feed/Forage?</b>	<b>Preharvest Interval</b>
Anthem MAXX	14/15	No	none listed
Assure II/Targa	1	No	80 days
Basagran	6	<b>Yes</b>	30 days
Cadet	14	No	60 days
Cheetah Max	10/14	No	70 days
Classic	2	No	60 days
Cobra/Phoenix	14	No	45 days
Engenia	4	<b>Yes</b>	7/14 days <sup>d</sup>
Enlist Duo	4/9	No	30 days
Enlist One	4	No	30 days
Extreme	2/9	No	85 days
FirstRate	2	<b>Yes</b>	70 days
Flexstar GT	9/14	No	45 days
Fusilade DX	1	No	Prebloom
Glyphosate <sup>c</sup>	9	<b>Yes<sup>c</sup></b>	14 days
Harmony	2	No	60 days
Liberty/Cheetah/Interline/Noventa	10	No	70 days
Marvel	14/14	No	60 days
Perpetuo	14/15	No	60 days
Poast/Poast Plus	1	<b>Yes</b>	75 days
Pursuit	2	No	85 days
Raptor	2	No	85 days
Reflex/Flexstar	14	No	45 days
Resource	14	No	60 days
Select/Arrow/Select Max	1	No	60 days
Sequence	9/15	No	75 days
Synchrony XP	2/2	No	75 days
Tavium	4/15	No	none listed
Ultra Blazer	14	No	50 days
Varisto	2/14	<b>Yes</b>	30 days
Warrant	15	No	none listed
Warrant Ultra	14/15	No	none listed
XtendiMax	4	<b>Yes</b>	7/14 days <sup>d</sup>

<sup>a</sup> Restrictions based on herbicide labels. Always read and follow herbicide labels.

<sup>b</sup> Herbicide Site of Action: The site of action key is located on pages 15-16.

<sup>c</sup> Consult specific glyphosate labels for feed and forage restrictions.

<sup>d</sup> Feeding and/or harvesting soybean forage/hay.

## TABLE 2Q – Weed Management in No-Till Soybean

Effective weed control in no-till soybeans requires control of **all weeds and cover crops** prior to soybean emergence. This can be accomplished by:

1. Late fall applications prior to planting soybeans the following spring (**FALL**).
2. Early spring applications — up to 30 days prior to soybean planting (**EPP**).
3. Applications at or very close to the time of planting (**PRE**).

Regardless of the time of herbicide application, burndown herbicide(s) must be applied to control **all** of the existing vegetation. If some plant species are not controlled prior to soybean emergence, they will be competitive with the soybean crop, ultimately leading to soybean yield loss.

Burndown herbicide options include herbicides without residual activity: glyphosate (Table 10), *Gramoxone* (paraquat), *Liberty*, 2,4-D ester, *Aim*, *Express*, *Vida*, *Sharpen*, and *Verdict*. These herbicides control only existing vegetation and **DO NOT** have residual activity to control weeds that have not yet emerged. The following table lists the effectiveness of these herbicides in burndown applications to control existing vegetation. Selection of these herbicides should be made on the basis of weed type, weed height and the speed of control. In general, *Gramoxone* and *Liberty* will provide faster control than glyphosate or 2,4-D ester, but glyphosate will provide better control of dense weeds or cover crops. Glyphosate is preferred for control of perennial weeds or grasses prior to the completion of tillering.

2,4-D ester provides effective control of several annual, biennial and perennial broadleaf weeds but does not control grasses. Each of these herbicides has one or more weed species that it does not control (e.g., 2,4-D ester does not control chickweed). Therefore, these herbicides are often tank-mixed for broad-spectrum burndown applications. Sometimes application rates of burndown herbicides need to be increased to control large weeds or dense weed infestations. Please consult the herbicide labels for information. None of these burndown herbicides have soil activity to stop new weeds from emerging. Herbicides that persist in the soil to stop new weeds from emerging may be included in the burndown application.

Certain residual herbicides have burndown activity on some weed species. **Table 2Q** gives the maximum weed height for **burndown** control of summer annual broadleaves and grasses. These herbicides are not as broad-spectrum as glyphosate, *Gramoxone*, *Liberty* or 2,4-D ester for burndown of existing vegetation. Therefore, the residual herbicides are always tank mixed with glyphosate, 2,4-D ester, *Gramoxone*, *Liberty* or combinations of glyphosate + 2,4-D ester. These residual herbicides will control germinating summer annual grasses and broadleaf weeds. The **effectiveness** of these residual herbicides on summer annual grass and broadleaf weed control is not the same. **Table 2A** gives the effectiveness ratings of these residual herbicides on annual weeds. The **length of weed control** from these residual herbicides is not the same. Some herbicides persist longer in the soil and are, therefore, more effective than

other herbicides when applied in the fall. There are fewer noticeable differences in the length of summer annual weed control when these herbicides are applied in the spring (**EPP**) or at planting (**PRE**).

**Table 2Q** gives the **length of summer weed control** (0 = no residual weed control; 1 = short residual control; 2 = moderate residual control; 3 = long residual control). When applying residual herbicides in the fall for summer annual weed control, choose a herbicide with a “3” rating. When applying residual herbicides in the spring, **EPP**, choose a herbicide with a “3” or “2” rating. When applying residual herbicides at or very close to the time of planting (**PRE**), choose a herbicide with a “3”, “2” or “1” rating.

A few important comments for each herbicide are listed below.

### Burndown Herbicides without Residual Activity

**Glyphosate:** Glyphosate can be applied in the **Fall**, **EPP** or **PRE** to control existing vegetation. Application rates range from 0.75 to 1.13 lb a.e./A, depending on weed size. Lower rates may be used to control smaller weeds at lower spray volumes — consult label. Consult **Table 2Q** for maximum weed heights and effectiveness ratings. There are many formulations of glyphosate. Consult **Table 10** for a list of glyphosate products, use rates and the need for additional surfactant. Ammonium sulfate (AMS) at 17 lb/100 gal should be added to glyphosate, regardless of formulation. The addition of 2,4-D ester greatly improves control of horseweed (marestalk), giant ragweed, mustards and some other key no-till weeds (see the following comments about 2,4-D ester). Herbicides with residual activity can also be tank mixed with glyphosate or glyphosate + 2,4-D ester.

**Gramoxone SL 2.0 (2 SL)** or **Gramoxone SL 3.0 (3 SL):** *Gramoxone SL* can be applied **EPP** or **PRE** to control existing vegetation. **Gramoxone is a restricted-use pesticide.** Certified applicators are now required to complete a paraquat specific training prior to use of *Gramoxone*. The paraquat training course can be found online at: [www.epa.gov/pesticide-worker-safety/paraquat-dichloride-training-certified-applicators](http://www.epa.gov/pesticide-worker-safety/paraquat-dichloride-training-certified-applicators). Apply *Gramoxone SL 2.0* at 2 pt/A for weeds less than 3 inches tall and 3.0 pt/A for weeds from 3 to 6 inches tall or apply *Gramoxone SL 3.0* at 1.33 pt/A for weeds less than 3 inches tall and 2 pt/A for weeds from 3 to 6 inches tall. Consult **Table 2Q** for maximum weed heights and effectiveness ratings. Always add surfactant at 0.25% v/v or a crop oil concentrate at 1% v/v. Regrowth of rye or wheat may occur if plants are not fully tillered when treated. Burndown effectiveness is highly dependent on the environment, with better burndown in warm, sunny conditions. For improved burndown control, *Gramoxone* can be tank mixed with 2,4-D ester or with a herbicide with residual activity.

**Parazone (3 SL):** *Parazone* contains the same active ingredient as *Gramoxone SL* (paraquat). Refer to the *Gramoxone SL 3.0* section for further remarks on *Parazone*. Certified applicators are now required to complete a paraquat specific training prior to use of *Parazone*. The paraquat training course can be found online at: [www.epa.gov/pesticide-worker-safety/paraquat-dichloride-training-certified-applicators](http://www.epa.gov/pesticide-worker-safety/paraquat-dichloride-training-certified-applicators).

## Table 2Q – Weed Management in No-Till Soybean (continued)

**Liberty(2.34 L):** *Liberty* can be applied **preplant** or **PRE** to control existing vegetation. Apply *Liberty* at 32 to 43 oz/A with ammonium sulfate at 17 lb/100 gal. If *Liberty* is used as a burndown herbicide, one additional in-season application can be made in LibertyLink soybean, as long as the season total does not exceed 87 fl oz/A. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications. Burndown effectiveness is highly dependent on the environment, with better burndown activity in warm, sunny conditions. Spray coverage is extremely important. *Liberty* requires a minimum of 15 gal/A of spray solution. Consult label and Table 12 for crop rotation restrictions. Tank-mixtures with *Sharpen* or *Metribuzin* can greatly improve burndown activity. *Liberty* can also be tank-mixed with 2,4-D ester or with a herbicide with residual activity to broaden the spectrum of weed control.

**2,4-D ester:** 2,4-D-ester can be applied in the **Fall** or **EPP** to control existing annual, biennial and perennial broadleaf weeds. One qt/A of 2,4-D ester can be applied in the fall and up to 30 days prior to soybean planting; 1 pt/A of 2,4-D ester can be applied up to 7 days prior to soybean planting. Consult **Table 2Q** for maximum weed heights and effectiveness ratings. 2,4-D ester does not control common chickweed. 2,4-D can be tank mixed with a number of herbicides for improved weed control.

**Enlist One (3.3 L):** *Enlist One* (2,4-D choline) can be applied in the **Fall** or **EPP** to control existing annual, biennial and perennial broadleaf weeds. *Enlist One* at 1 qt/A can be applied in the fall and up to 14 days prior to planting soybean, 1 pt/A can be applied up to 7 days prior to soybean planting. DO NOT use on sandy soils with less than 1% organic matter. Soybean should be planted at least 1 inch deep. 2,4-D will not control common chickweed and can be tank mixed with a number of herbicides for improved control.

**Elevore (0.572 L):** *Elevore* (halauxifen) can be applied **up to 14 days prior to planting soybean** to control existing vegetation i.e., glyphosate-resistant horseweed. Apply *Elevore* at 1 oz/A with either 1% v/v of methylated seed oil or crop oil concentrate. Consult **Table 2Q** for maximum weed heights and effectiveness ratings. *Elevore* should be tank mixed with additional products i.e., glyphosate to broaden the spectrum of weed control. At least 14 days must pass between *Elevore* application and soybean planting.

**Express (50 SG):** *Express* can be applied in the fall and in the **spring 7 days or more** prior to soybean planting. Apply *Express* at 0.25 to 0.5 oz/A — use the higher rate for denser weed populations or weeds that are only partially controlled. If *Express* is applied at 0.25 oz/A soybean can be planted 1 day after application, unless on light textured soils or soils with pH greater than 7.9. Consult **Table 2Q** for maximum weed heights and effectiveness ratings. Always add crop oil concentrate at 1% v/v. *Express* is very effective on common chickweed. For best burndown results, the addition of 2,4-D ester is recommended. *Express* can also be tank mixed with herbicides that have residual activity.

**Panoflex (50 WG):** *Panoflex* can be applied in the **Fall** or **preplant** (preplant application timing is rate dependent) to control existing vegetation. *Panoflex* contains *Harmony* (thifensulfuron) and *Express* (tribenuron) (see **Table 2C**). A minimum of 1 day

is needed between *Panoflex* application at 0.3 oz/A and soybean planting; and a minimum of 7 days is needed prior to planting at 0.6 oz/A. When *Panoflex* is used on light textured soils (sands or loamy sands) or the soil pH is >7.9 extend the time to planting by 7 additional days. The higher application rate is needed for Canada thistle control. Always add a non-ionic surfactant at 0.5% v/v or crop oil concentrate at 1% v/v and a nitrogen source urea ammonium nitrate (UAN) or ammonium sulfate (AMS) at 2-4 lb/A. Additive selection will be dependent on the tank-mix partner. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications. Consult label and Table 12 for crop rotation restrictions. Tank-mixtures with 2,4-D ester is recommended for control of horseweed (marestail), curly dock, and hairy vetch. Tank-mixtures with glyphosate, 2,4-D ester + glyphosate, *Gramoxone*, or *Liberty* may also be used to broaden the spectrum of burndown weed control.

**Aim (2 EC):** *Aim* (carfentrazone) is labeled for preplant (**EPP**) through **PRE** burndown applications. Apply *Aim* at 0.5 to 2 oz/A; use the higher rate to control larger weeds (4 inches tall). *Aim* is a contact herbicide without residual activity and is effective only on broadleaf weeds. Always add surfactant (0.25% v/v) or crop oil concentrate (1% v/v). Visual injury symptoms appear soon after *Aim* application. *Aim* can be tank mixed with glyphosate, 2,4-D ester and/or herbicides with residual activity. Consult **Table 2Q** for maximum weed heights and effectiveness ratings.

**Vida (0.2 L):** *Vida* (pyraflufen) is labeled for preplant (**EPP**) burndown applications. Apply *Vida* at 0.5 to 2 oz/A; use the higher rate to control larger weeds (4 inches tall). *Vida* is a contact herbicide without residual activity and is effective only on broadleaf weeds. Always add surfactant (0.25% v/v) or crop oil concentrate (1% v/v). Visual injury symptoms appear soon after *Vida* application. *Vida* can be tank mixed with glyphosate, 2,4-D ester and/or herbicides with residual activity. The pH of the spray solution needs to be less than 7.5 or hydrolysis will occur. Consult **Table 2Q** for maximum weed heights and effectiveness ratings.

**Reviton (2.83 L):** *Reviton* (tiafenacil) is labeled for **preplant** burndown applications prior to soybean emergence. Apply *Reviton* at 1 to 3 oz/A. *Reviton* is a contact herbicide without residual activity. The use of a methylated seed oil (1% v/v) + ammonium sulfate is the preferred adjuvant; however, a crop oil concentrate (1% v/v) or non-ionic surfactant (0.25%) with ammonium sulfate can be substituted. *Reviton* is best used in combination with glyphosate. Consult **Table 2Q** for maximum weed heights and effectiveness ratings.

**Sharpen (2.85 L):** *Sharpen* can be applied **preplant** or **PRE** to control existing broadleaf vegetation. Apply *Sharpen* at 1 oz/A prior to soybean emergence. For enhanced burndown activity, higher rates of *Sharpen* can be applied. However, longer intervals are required between *Sharpen* application and soybean planting; a minimum of 14 days for 1.5 oz/A and 30 days for 2 oz/A of *Sharpen*. Always add a methylated seed oil (1% v/v) and ammonium sulfate (AMS) at 17 lb/100 gal. DO NOT apply *Sharpen* after soybean emergence or severe crop injury will occur. DO NOT apply to coarse-textured soils with 2% less organic matter unless soybean is planted 1 month after application; *Sharpen* at 2 oz/A requires 44 days. Tank mixtures or

## Table 2Q – Weed Management in No-Till Soybean (continued)

sequential applications of *Sharpen* with other Group 14 containing herbicides, such as flumioxazin (*Valor*), sulfentrazone (*Authority* or *Spartan*), or fomesafen (*Reflex*), require 14 days between application and soybean planting with *Sharpen* at 1 oz/A and 30 days with *Sharpen* at 1.5 to 2 oz/A in reduced and no-till soybean. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications. Consult label and Table 12 for crop rotation restrictions. DO NOT include time in the rotation interval when the ground is frozen. Rotation restrictions are longer for application rates greater than 1 oz/A. *Sharpen* is a very effective herbicide on horseweed (marestalk) and may provide 2 to 4 weeks of residual control against this weed. *Sharpen* should be tank mixed with glyphosate or glyphosate + 2,4-D ester to broaden the spectrum of burndown weed control.

**Verdict (5.57 L):** *Verdict* can be applied in the **Fall, preplant** or **PRE** to control existing broadleaf vegetation. *Verdict* contains *Sharpen* (saflufenacil) and *Outlook* (dimethenamid-P) (see **Table 2C**). The labeled rate of *Verdict* for use in soybean is 5 to 10 oz/A. The soybean rate of 5 oz/A of *Verdict* will not provide residual weed control. For additional residual control and enhanced burndown activity, higher rates of *Verdict* can be applied. However, longer intervals are required between *Verdict* application and soybean planting; a minimum of 14 days for 7.5 oz/A and 30 days for 10 oz/A of *Verdict*. Always add a methylated seed oil (1% v/v) and ammonium sulfate (AMS) at 17 lb/100 gal. DO NOT apply *Verdict* after soybean emergence or severe crop injury will occur. DO NOT apply to coarse textured soils with less than 2% organic matter, unless soybean is planted 30 days after application. DO NOT tank-mix or apply *Verdict* within 30 days of soil-applied applications of flumioxazin (*Valor*), sulfentrazone (*Authority* or *Spartan*), or fomesafen (*Reflex*, *Flexstar*) containing products. However, fomesafen (*Flexstar*, *Reflex*) and other POST PPO-inhibiting herbicides can be used 14 days after soybean emergence. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications. Consult label and Table 12 for crop rotation restrictions. Rotation restrictions are longer for *Verdict* applications rates greater than 5 oz/A. *Verdict* is a very effective herbicide on horseweed (marestalk) and may provide 2 to 4 weeks of residual control against this weed. *Verdict* should be tank-mixed with glyphosate to broaden the spectrum of burndown weed control.

### Burndown Herbicides with Residual Activity

**Afforia (50.8 WG):** *Afforia* can be applied in the **Fall, preplant**, or **PRE** (PRE applications are rate dependent) to control existing vegetation and to provide residual weed control. *Afforia* contains *Harmony* (thifensulfuron), *Express* (tribenuron), and *Valor* (flumioxazin) (see **Table 2C**). *Afforia* at 2.5 oz/A can be applied preemergence up to 3 days after planting, but prior to soybean emergence; at rates greater than 2.5 to 3.75 oz/A 7 days is needed prior to planting. Always add a crop oil concentrate at 1% v/v or unless tank-mix products do not allow the use of a crop oil concentrate than use a non-ionic surfactant at 0.25% v/v. The addition of ammonium sulfate (AMS) at 17 lb/100 gal may aid in control when tank-mixed with glyphosate. DO NOT tank mix or apply with metolachlor (*Dual*), dimethenamid (*Outlook*) or acetochlor (*Warrant*) products within 14 days of planting, unless soybeans are planted under no-till or minimum tillage conditions on wheat stubble or no-till field corn stubble or crop

injury will occur. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications and **Table 2A** for residual weed control. Consult label and Table 12 for crop rotation restrictions. Tank-mixtures with 2,4-D ester, is recommended for best burndown results. Tank-mixtures with glyphosate, 2,4-D ester + glyphosate, *Gramoxone*, or *Liberty* may also be used to broaden the spectrum of burndown weed control.

**Authority Assist (4 L):** *Authority Assist* can be applied in the **Fall, EPP** (up to 45 days) or **PRE** to control existing vegetation and to provide residual control. *Authority Assist* contains *Spartan* (sulfentrazone) and *Pursuit* (see **Table 2C**). *Authority Assist* use rates are based on soil texture, organic matter, and pH. *Authority Assist* rates range from 6 to 12 oz/A (10 oz/A). Reduced rates ranging from 4 to 6 oz/A (5 oz/A) can be applied as part of a 2-pass program in glufosinate or glyphosate-resistant soybean, unless resistant weeds are present. DO NOT apply to soils with pH of 7.5 or higher. Always add a crop oil concentrate or a methylated seed oil (1% v/v). Soybean varieties vary in their sensitivity to sulfentrazone, a component in *Authority Assist*; consult your local seed dealer for information. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications and **Table 2A** for residual weed control. Consult label and Table 12 for crop rotation restrictions. *Authority Assist* should be tank-mixed with 2,4-D ester, glyphosate, glyphosate + 2,4-D ester or *Gramoxone* to broaden the spectrum of burndown weed control.

**Authority First/Sonic (70 DF):** *Authority First/Sonic* can be applied **EPP** (up to 14 days) or **PRE** to control existing vegetation and to provide residual weed control. *Authority First/Sonic* contains *Spartan* (sulfentrazone) and *FirstRate* (see **Table 2C**). Apply *Authority First/Sonic* at 6.4 oz/A. Reduced rates ranging from 3.2 to 6 oz/A (4 oz/A) can be applied as part of a 2-pass program in glufosinate or glyphosate-resistant soybean, unless resistant weeds are present. Always add surfactant at 0.25% v/v + 28% N or ammonium sulfate (AMS) or crop oil concentrate + 28% N or AMS. Soybean varieties vary in their sensitivity to sulfentrazone, a component in *Authority First/Sonic*. Consult your local seed dealer for information. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications and **Table 2A** for residual weed control. Consult label and Table 12 for crop rotation restrictions. *Authority First/Sonic* should be tank mixed with 2,4-D ester, glyphosate, glyphosate + 2,4-D ester, or *Gramoxone* to broaden the spectrum of burndown weed control.

**Authority MAXX (66 WG):** *Authority MAXX* can be applied in the **Fall, preplant** or **PRE** to control existing broadleaf vegetation. *Authority MAXX* contains *Spartan* (sulfentrazone) and *Classic* (chlorimuron-ethyl) (see **Table 2C**). Apply *Authority MAXX* at 5 oz/A as part of a planned 2-pass program. DO NOT apply *Authority MAXX* to soils with pH greater than 7.6. Always add a crop oil concentrate or a methylated seed oil at 1% v/v or a non-ionic surfactant at 0.25% v/v. The addition of ammonium sulfate (AMS) at 17 lb/100 gal may aid in control when tank-mixed with glyphosate. Soybean varieties vary in their sensitivity to sulfentrazone a component in *Authority MAXX*; consult your local seed dealer for information. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications and **Table 2A** for residual weed control. Consult

## Table 2Q – Weed Management in No-Till Soybean (continued)

label and Table 12 for crop rotation restrictions. *Authority MAXX* should be tank-mixed with 2,4-D ester, glyphosate, *Gramoxone*, *Sharpen*, *Express*, or *Express* + 2,4-D ester to broaden the spectrum of burndown weed control.

**Authority MTZ (45 DF):** *Authority MTZ* can be applied in the **Fall**, **EPP** (up to 45 days) or **PRE** to control existing vegetation and to provide residual weed control. *Authority MTZ* contains *Spartan* (sulfentrazone) and *Metribuzin* (see **Table 2C**). *Authority MTZ* use rates are based on soil texture, organic matter, and pH. *Authority MTZ* rates range from 12 to 20 oz/A (16 oz/A). Reduced rates ranging from 8 to 14 oz/A (12 oz/A) can be applied as part of a 2-pass program in glufosinate or glyphosate-resistant soybean, unless resistant weeds are present. DO NOT apply *Authority MTZ* at rates greater than 12 oz/A if the soil pH is greater than 7.5. Always add crop oil concentrate (1% v/v). Soybean varieties vary in their sensitivity to sulfentrazone and metribuzin components in *Authority MTZ*; consult your local seed dealer for information. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications and **Table 2A** for residual weed control. Consult label and Table 12 for crop rotation restrictions. *Authority MTZ* should be tank mixed with 2,4-D ester, glyphosate, glyphosate + 2,4-D ester, or *Gramoxone* to broaden the spectrum of burndown weed control.

**Authority XL (70 WG):** *Authority XL* can be applied in the **Fall**, **preplant** or **PRE** to control existing broadleaf vegetation. *Authority XL* contains *Spartan* (sulfentrazone) and *Classic* (chlorimuron-ethyl) (see **Table 2C**). Apply *Authority XL* at 3 to 5 oz/A as part of a planned 2-pass program. DO NOT apply *Authority XL* to soils with pH greater than 7.6. Always add a crop oil concentrate or a methylated seed oil at 1% v/v or a non-ionic surfactant at 0.25% v/v. The addition of ammonium sulfate (AMS) at 17 lb/100 gal may aid in control when tank-mixed with glyphosate. Soybean varieties vary in their sensitivity to sulfentrazone a component in *Authority XL*; consult your local seed dealer for information. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications and **Table 2A** for residual weed control. Consult label and Table 12 for crop rotation restrictions. *Authority XL* should be tank-mixed with 2,4-D ester, glyphosate, *Gramoxone*, *Express*, or *Express* + 2,4-D ester to broaden the spectrum of burndown weed control.

**Autumn Super 51 WDG (51 WG):** *Autumn Super 51 WDG* at 0.5 oz/A may be applied in the **Fall only** to control existing vegetation of certain weeds and provide some residual weed control. *Autumn Super 51 WDG* contains iodosulfuron and thiencazone-methyl (see **Table 2C**). Always add a crop oil concentrate or a methylated seed oil (1% v/v) and ammonium sulfate (2.5 lb/A). *Autumn Super 51 WDG* will not control ALS-resistant weeds. Consult **Table 2Q** for maximum weed heights and effectiveness ratings. For improved burndown control, tank mixes with 2,4-D ester or glyphosate are recommended. Consult label and Table 12 for crop rotation restrictions.

**Canopy (75 WG):** *Canopy* can be applied in the **Fall**, **EPP** (up to 45 days) or **PRE** to control existing vegetation and to provide residual weed control in no-till and conservation till soybean. *Canopy* contains *Classic* (chlorimuron) and metribuzin (see **Table 2C**). *Canopy* use rates are based on soil texture, organic matter, and pH. *Canopy*

rates range from 4 to 7 oz/A (4.5 oz/A). Reduced rates ranging from 2.25 to 4 oz/A (3 oz/A) can be applied as part of a 2-pass program in glufosinate or glyphosate-resistant soybean, unless resistant weeds are present. DO NOT apply *Canopy* at rates greater than 2.25 oz/A to soils with a composite pH greater than 7.0; use of higher rates may result in unacceptable injury to this year's crop and the following crop. DO NOT apply *Canopy* to soils with a composite pH exceeding 7.6. Always add a crop oil concentrate at 1% v/v or surfactant at 0.25% v/v. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications and **Table 2A** for residual weed control. Fall applications of *Canopy* provide early-season residual control of certain weeds including common lambsquarters. However, effectiveness from the residual components of *Canopy* is greater the closer it is applied to planting. Consult label and **Table 12** for crop rotation restrictions. For fall applications, adjust the rotational crop intervals by basing the interval on the date of soybean planting, not herbicide application. The addition of 2,4-D ester in the fall or in EPP applications is recommended and is required for control of certain weeds. *Canopy* can be tank mixed with *Express* (fall) or glyphosate to improve common chickweed control.

**Canopy EX (29.5 WG):** *Canopy EX* can be applied in the **Fall** and to the time of soybean planting (**preplant**) at rates ranging from 1.1 to 1.5 oz/A. For application rates greater than 1.5 and up to 2.2 oz/A of *Canopy EX* applications need to occur at least 7 day prior to soybean planting. *Canopy EX* contains *Classic* (chlorimuron) and *Express* (see **Table 2C**). *Canopy EX* use rates range from 1.1 to 2.2 oz/A, depending on soil pH. DO NOT apply *Canopy EX* at rates greater than 1.1 oz/A to soils with a composite pH greater than 7.0. DO NOT apply *Canopy EX* to soils with a composite pH exceeding 7.6. Always add a crop oil concentrate at 1% v/v or surfactant at 0.25% v/v. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications and **Table 2A** for residual weed control. Consult label and Table 12 for crop rotation restrictions. For fall applications, adjust the rotational crop intervals by basing the interval on the date of soybean planting, not herbicide application. Fall applications of *Canopy EX* provide early-season residual control of certain weeds including common lambsquarters. However, effectiveness from the residual component of *Canopy EX* is greater the closer it is to planting. *Canopy EX* will not control ALS-resistant weeds. For best burndown results, the addition of 2,4-D ester is recommended.

**Dimetric Charged (3.67 L):** *Dimetric Charged* can be applied in the **Fall**, **EPP**, or **PRE** to control existing vegetation and to provide residual weed control. *Dimetric Charged* contains *Metribuzin* and *Valor* (see **Table 2C**). *Dimetric Charged* use rates are based on soil texture, organic matter, and pH. Use rates are 12 oz/A for coarse textured soils or calcareous soils; 15 to 18 oz/A for medium textured soils; and 18 oz/A for fine textured soils. For soils with pH of 7.5 or higher use a maximum of 12 oz/A. DO NOT apply on coarse soils with less than 2% organic matter or soils with less than 1% organic matter. Always add a crop oil concentrate at 1% v/v + AMS. Consult **Table 2P** for maximum burndown weed heights and effectiveness ratings and **Table 2A** for residual weed control. DO NOT tank mix or apply with metolachlor (*Dual*), dimethenamid (*Outlook*), or acetochlor (*Warrant*) products within 14 days of planting, unless soybeans are



## Table 2Q – Weed Management in No-Till Soybean (continued)

planted under no-till or minimum tillage conditions on wheat stubble or no-till field corn stubble or crop injury will occur. The effectiveness of *Dimetric Charged* is greater the closer it is to planting. Consult the label and Table 12 for crop rotation restrictions. *Dimetric Charged* should be tank mixed with 2,4-D ester, glyphosate, 2,4-D ester + glyphosate, *Gramoxone*, or *Liberty* to broaden the spectrum of burndown weed control.

**Envive (41.3 WG):** *Envive* can be applied in the **Fall, EPP** or **PRE** to control existing vegetation and to provide residual weed control. *Envive* contains *Classic* (chlorimuron), *Harmony*, and *Valor* (see **Table 2C**). *Envive* use rates range between 2.5 and 5.3 oz/A, for portions of Michigan south of highway I-96. The maximum use rate of *Envive* for portions of the Michigan north of I-96 is 2.5 oz/A. Soil pH also influences the maximum use rate of *Envive*. If the composite soil pH is between 7.1 and 7.6, do not apply more than 2.5 oz/A. DO NOT apply to soils with a composite pH exceeding 7.6. Always add a crop oil concentrate at 1% v/v. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications and **Table 2A** for residual weed control. DO NOT tank mix with Group 15 herbicides such as metolachlor (*Dual*), dimethenamid (*Outlook*), or acetochlor (*Warrant*) products within 14 days of planting, unless soybeans are planted under no-till or minimum till conditions on wheat stubble or no-till field corn stubble. Fall applications of *Envive* provide early-season residual control of certain weeds including common lambsquarters. However, effectiveness from the residual components of *Envive* is greater the closer it is applied to planting. Consult label and Table 12 for crop rotation restrictions. For best burndown results, the addition of 2,4-D ester is recommended.

**Extreme (2.17 L):** *Extreme* can be applied in the **Fall, EPP** (up to 45 days) or **PRE** to control existing vegetation and to provide residual weed control. *Extreme* contains glyphosate and *Pursuit* (see **Table 2C**). Apply *Extreme* at 3 pt/A. Always add surfactant at 0.25% v/v + 17 lb/100 gal of ammonium sulfate (AMS). Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications and **Table 2A** for residual weed control (*Pursuit*). Effectiveness from the residual component of *Extreme* is greater the closer it is applied to planting. Consult label and Table 12 for crop rotation restrictions. For fall applications, adjust the rotational crop intervals by basing the interval on the date of soybean planting, not herbicide application. Apply with 2,4-D ester for improved horseweed (marestail) and perennial weed control.

**Fierce EZ (3.04 L):** *Fierce* can be applied in the **Fall, preplant** or **PRE** to control existing vegetation and to provide residual weed control. *Fierce* contains *Valor* (flumioxazin) and *Zidua* (pyroxasulfone) (see **Table 2C**). Apply *Fierce EZ* at 6 to 7.5 oz/A, depending on soil type and application timing. Always add a crop oil concentrate or a methylated seed oil at 1% v/v or a non-ionic surfactant at 0.25% v/v. The addition of ammonium sulfate (AMS) at 17 lb/100 gal may aid in control when tank-mixed with glyphosate. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications and **Table 2A** for residual weed control. The effectiveness of *Fierce* is greater the closer it is to planting. Consult label and Table 12 for crop rotation restrictions. *Fierce* should be tank-mixed with 2,4-D ester, glyphosate, 2,4-D ester + glyphosate, *Gramoxone*, or *Liberty* to broaden the spectrum of burndown weed control.

**Fierce MTZ/Kyber (2.64 L):** *Fierce MTZ/Kyber* can be applied in the **Fall, preplant** or **PRE** to control existing vegetation and to provide residual weed control. *Fierce MTZ/Kyber* contains *Valor* (flumioxazin), *Metribuzin*, and *Zidua* (pyroxasulfone) (see **Table 2C**). Apply *Fierce MTZ/Kyber* at 1 to 1.5 pt/A, depending on soil type and organic matter. Always add a crop oil concentrate or a methylated seed oil at 1% v/v or a non-ionic surfactant at 0.25% v/v. The addition of ammonium sulfate (AMS) at 17 lb/100 gal may aid in control when tank-mixed with glyphosate. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications and **Table 2A** for residual weed control. The effectiveness of *Fierce MTZ/Kyber* is greater the closer it is to planting. DO NOT apply on coarse soils with less than 2% organic matter or soils with less than 1% organic matter. Crop injury may occur from applications made to poorly drained soils, under cool, wet conditions or when soils with a pH of 7.5 or higher. DO NOT apply after soybean emergence – severe injury or death may occur. Consult label and Table 12 for crop rotation restrictions. *Fierce MTZ/Kyber* should be tank-mixed with 2,4-D ester, glyphosate, 2,4-D ester + glyphosate, *Gramoxone*, or *Liberty* to broaden the spectrum of burndown weed control.

**Fierce XLT (62.41 WG):** *Fierce XLT* can be applied in the **Fall, preplant** or **PRE** to control existing vegetation and to provide residual weed control. *Fierce XLT* contains *Valor* (flumioxazin), *Classic* (chlorimuron) and *Zidua* (pyroxasulfone) (see **Table 2C**). Apply *Fierce XLT* at 4 oz/A as part of a 2-pass program. Always add a crop oil concentrate or a methylated seed oil at 1% v/v or a non-ionic surfactant at 0.25% v/v. The addition of ammonium sulfate (AMS) at 17 lb/100 gal may aid in control when tank-mixed with glyphosate. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications and **Table 2A** for residual weed control. DO NOT apply *Fierce XLT* to soils with a composite pH greater than 6.8. Crop injury may occur when *Fierce XLT* is applied to poorly drained soils and/or under cool, wet conditions. Consult label and Table 12 for crop rotation restrictions. *Fierce XLT* should be tank-mixed with 2,4-D ester, glyphosate, 2,4-D ester + glyphosate, *Gramoxone*, or *Liberty* to broaden the spectrum of burndown weed control.

**FirstRate (84 WG):** *FirstRate* can be applied **EPP** (up to 14 days) or **PRE** for control of existing vegetation and to provide residual weed control. Apply *FirstRate* at 0.3 to 0.6 oz/A, use the 0.6 oz/A rate for improved residual control. Always add crop oil concentrate at 1% v/v and 28% N at 2.5% v/v. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications and **Table 2A** for residual weed control. *FirstRate* will not control ALS-resistant weeds. To broaden the spectrum of weed control, tank mix with glyphosate, *Gramoxone* or 2,4-D ester. More effective burndown occurs when conditions are warm and sunny.

**Flexstar 3.5 GT (2.82 L):** *Flexstar GT 3.5* can be applied **pre-plant** or **PRE** to control existing vegetation and to provide some residual weed control. *Flexstar GT 3.5* contains glyphosate and *Flexstar* (see **Table 2C**). Apply *Flexstar GT 3.5* at 3 pt/A. Crop oil concentrate at 1% v/v and ammonium sulfate (AMS) at 17 lb/100 gal. should be added to *Flexstar GT 3.5*. DO NOT apply products containing fomesafen (*Flexstar*, *Flexstar GT 3.5*, *Prefix* or *Reflex*) to the same field in CONSECUTIVE years. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown

## Table 2Q – Weed Management in No-Till Soybean (continued)

applications. Consult label and Table 12 for crop rotation restrictions. The addition of 2,4-D ester may enhance horseweed (marestail) and perennial weed control.

**Linex/Lorox (4 L):** *Linex/Lorox* can be applied **EPP** (up to 30 days) or **PRE** for control of existing vegetation and to provide residual weed control. Apply *Linex/Lorox* at 1 pt/A. Always add crop oil concentrate at 1% v/v (preferred) or 0.25% v/v surfactant. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications and **Table 2A** for residual weed control. Effectiveness from *Linex/Lorox* is greater the closer it is applied to planting. To broaden the spectrum of weed control, tankmix with glyphosate or 2,4-D ester.

**Metribuzin (75 DF):** *Metribuzin* can be applied **EPP** (up to 30 days) or **PRE** for control of existing vegetation and to provide residual weed control. *Metribuzin* use rates are dependent on soil texture, organic matter, and pH. Apply *Metribuzin* at 8 oz/A. A lower rate of 5.33 oz/A can be applied in tank mixtures or as part of a 2-pass program in glufosinate or glyphosate-resistant soybean. Always add crop oil concentrate at 1% v/v. *Metribuzin* can also be applied in the fall for burndown activity of winter annual weeds, but it is not likely to provide extended residual control in the spring. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications and **Table 2A** for residual weed control. Effectiveness from *Metribuzin* is greater the closer it is applied to planting. *Metribuzin* will not control triazine-resistant weeds. To broaden the spectrum of weed control, tank mix with glyphosate, *Gramoxone*, 2,4-D ester, *Liberty* or *Sharpen*.

**OpTill (68 WG):** *OpTill* can be applied **preplant** or **PRE** to control existing vegetation and to provide residual control. *OpTill* contains *Sharpen* (saflufenacil) and *Pursuit* (see **Table 2C**). Apply *OpTill* at 2 oz/A. Always add a methylated seed oil (1% v/v) and ammonium sulfate (AMS) at 17 lb/100 gal. DO NOT apply *OpTill* after soybean emergence or severe crop injury will occur. DO NOT apply to coarse-textured soils with less than 2% organic matter unless soybean is planted 1 month after application. DO NOT tank mix or apply *OpTill* within 30 days of products containing flumioxazin (*Valor*), sulfentrazone (*Authority* or *Spartan*), or fomesafen (*Reflex*). Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications and **Table 2A** for residual weed control. Consult label and Table 12 for crop rotation restrictions. *OpTill* should be tank mixed with glyphosate or glyphosate + 2,4-D ester to broaden the spectrum of burndown weed control.

**Python (80 WG):** *Python* can be applied **EPP** (up to 30 days) or **PRE** for control of existing vegetation and to provide residual weed control. Apply at 1.14 oz/A. Always add crop oil concentrate at 1% v/v. Can also be applied in the **Fall** for burndown activity of winter annual weeds, but it is not likely to provide extended residual control in the spring. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications and **Table 2A** for residual weed control. Effectiveness is greater the closer it is applied to planting. *Python/Accolade* will not control ALS-resistant weeds. To broaden the spectrum of weed control, tank-mix with glyphosate, *Gramoxone* or 2,4-D ester. More effective burndown occurs when conditions are warm and sunny.

**Sequence (5.25 L):** *Sequence* can be applied **EPP** (up to 30 days) or **PRE** to control existing vegetation and to provide residual weed control. *Sequence* contains glyphosate and *Dual Magnum* (see **Table 2C**). Apply *Sequence* at 2.5 pt/A. Ammonium sulfate (AMS) at 17 lb/100 gal should be added. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications and **Table 2A** for residual weed control (*Dual Magnum*). The addition of 2,4-D ester may enhance horseweed (marestail) and perennial weed control.

**Spartan Charge (3.5 SC):** *Spartan Charge* can be applied in the **Fall**, **EPP** or **PRE** to control existing vegetation and to provide residual control. *Spartan Charge* contains *Spartan* (sulfentrazone) and *Aim* (see **Table 2C**). *Spartan Charge* use rates are based on soil texture, organic matter, and pH. *Spartan Charge* rates range from 5.75 to 8.5 oz/A (8 oz/A). A reduced rate of 6 oz/A can be applied as part of a 2-pass program in glufosinate or glyphosate-resistant soybean, unless resistant weeds are present. Use the lower end of the rate range when the pH is greater than 7.0. DO NOT apply *Spartan Charge* to soils with pH of 7.5 or higher or on sands with less than 1% organic matter. Always add a 0.5% v/v of a non-ionic surfactant and 17 lb/100 gal of ammonium sulfate. Soybean varieties vary in their sensitivity to sulfentrazone, a component in *Spartan Charge*; consult your local seed dealer for information. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications and **Table 2A** for residual weed control. Consult label and Table 12 for crop rotation restrictions. For improved burndown control, tank mixes with 2,4-D ester or glyphosate are recommended.

**Surveil (48 WG):** *Surveil* can be applied in the **Fall**, **EPP** or **PRE** to control existing vegetation and to provide residual weed control. *Surveil* contains *FirstRate* (cloransulam) and *Valor* (flumioxazin) (see **Table 2C**). Use rates range from 2.1-4.2 oz/A, 3.5 oz/A is a typical rate, unless *Surveil* is part of a 2-pass program in glufosinate or glyphosate-resistant soybean, a lower rate of 2.8 oz/A can be applied. Always add crop oil concentrate at 1% v/v; ammonium sulfate is also recommended. Consult **Table 2Q** for maximum weed heights and effectiveness ratings and **Table 2A** for residual weed control. DO NOT tank mix with Group 15 herbicides such as metolachlor (*Dual*), dimethenamid (*Outlook*), acetochlor (*Warrant*), or pyroxasulfone (*Zidua*) products within 14 days of planting, unless soybeans are planted under no-till or minimum till conditions on wheat stubble or no-till field corn stubble. Refer to label and **Table 12** for crop rotation restrictions. For best burndown results, the addition of 2,4-D ester, glyphosate, or glyphosate + 2,4-D ester is recommended. *Gramoxone* or *Liberty* may also be used to broaden the spectrum of burndown weed control.

**Synchrony XP (28.4 WG):** *Synchrony XP* can be applied **EPP** (up to 45 days) or **PRE** to control existing vegetation and to provide residual weed control. *Synchrony XP* contains *Classic* (chlorimuron) and *Harmony* (see **Table 2C**). *Synchrony XP* use rates range between 1 and 3 oz/A, depending on soil pH. If the composite soil pH is between 7.1 and 7.6, do not apply more than 1 oz/A. DO NOT apply to soils with a composite pH exceeding 7.6. Use a minimum of 1 oz/A of *Synchrony XP* for burndown activity and a minimum of

**Table 2Q – Weed Management in No-Till Soybean (continued)**

1.25 oz/A for residual control of labeled weeds. Always add a crop oil concentrate at 1% v/v. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications and **Table 2A** for residual weed control. Fall applications of *Synchrony XP* provide early-season residual control of certain weeds including common lambsquarters. However, effectiveness from the residual components of *Synchrony XP* is greater the closer it is applied to planting. Consult label and Table 12 for crop rotation restrictions. *Synchrony XP* will not control ALS-resistant weeds. For best burndown results, the addition of 2,4-D ester is recommended.

**Trivence (61.3 WG):** *Trivence* can be applied in the **Fall, EPP**, or **PRE** to control existing vegetation and to provide residual weed control. *Trivence* contains *Classic* (chlorimuron), *Metribuzin*, and *Valor* (flumioxazin) (see **Table 2C**). *Trivence* use rates range from 6 and 8 oz/A for portions of Michigan south of State Road 46. The maximum use rate of *Trivence* for portions north of State Road 46 is 6 oz/A. If soil pH is greater than 7, do not exceed 6 oz/A of *Trivence*. DO NOT use *Trivence* if soil pH exceeds 7.6. Always add a crop oil concentrate at 1% v/v. DO NOT tank mix or apply with metolachlor (*Dual*), dimethenamid (*Outlook*) or acetochlor (*Warrant*) products within 14 days of planting, unless soybeans are planted under no-till or minimum tillage conditions on wheat stubble or no-till field corn stubble or crop injury will occur. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications and **Table 2A** for residual weed control. Consult label and Table 12 for crop rotation restrictions. For best burndown results, the addition of 2,4-D ester is recommended. Tank-mixtures with glyphosate, 2,4-D ester + glyphosate, *Gramoxone*, or *Liberty* may also be used to broaden the spectrum of burndown weed control.

**Valor (51 WG) or Valor EZ (4 L):** *Valor/Valor EZ* can be applied **EPP** (up to 14 days) or **PRE** for control of existing vegetation and to provide residual weed control. Apply at 2 to 3 oz/A, 2.5 oz/A is the typical use rate. Always add crop oil concentrate at 1% v/v; for burndown activity. Can also be applied in the **Fall** for burndown activity of winter annual weeds, but it is not likely to provide extended residual control in the spring. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications and **Table 2A** for residual weed control. DO NOT tank mix or apply with metolachlor (*Dual*), dimethenamid (*Outlook*) or acetochlor (*Warrant*) products – crop injury will occur. These tank mixtures can be made if there is 14 days between application and planting or if there is 14 days between application of *Valor/Valor EZ* and applications of these other products. Effectiveness is greater the closer it is applied to planting. More effective burndown occurs when conditions are warm and sunny. *Valor/Valor EZ* has poor postemergence activity on horseweed (marestail), but it had good preemergence activity. Tank-mix with 2,4-D ester, glyphosate, glyphosate + 2,4-D ester, or *Gramoxone* to broaden the spectrum of burndown weed control.

**Valor XLT (40.3 WG):** *Valor XLT* can be applied in the **Fall, EPP** or **PRE** to control existing vegetation and to provide residual weed control. *Valor XLT* contains *Classic* (chlorimuron) and *Valor/Rowel* (flumioxazin) (see **Table 2C**). Use rates range between 3 and 5 oz/A (4 oz/A), depending on soil pH. If the composite soil pH is greater

than 6.8, do not apply more than 2.5 oz/A. Weeds will only be suppressed at this rate. DO NOT apply to soils with a composite pH exceeding 7.6. Always add a crop oil concentrate at 1% v/v; ammonium sulfate is also recommended. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications and **Table 2A** for residual weed control. DO NOT tank mix or apply with metolachlor (*Dual*), dimethenamid (*Outlook*) or acetochlor (*Warrant*) products – crop injury will occur. These tank mixtures can be made if there is 14 days between application and planting or if there is 14 days between application of *Valor XLT* and applications of these other products. Fall applications provide early-season residual control of certain weeds including common lambsquarters. However, effectiveness from the residual components of *Valor XLT* is greater the closer it is applied to planting. Consult label and Table 12 for crop rotation restrictions. For best burndown results, the addition of 2,4-D ester, glyphosate, or glyphosate + 2,4-D ester is recommended.

**Zidua PRO (4.09 L):** *Zidua PRO* can be applied in the **Fall, pre-plant** or **PRE** to control existing vegetation and to provide residual control. *Zidua PRO* is a premixture of *OpTill* (*Sharpen* + *Pursuit*) and *Zidua* (see **Table 2C**). Apply *Zidua PRO* at 6 oz/A. Always add a methylated seed oil (1% v/v) and ammonium sulfate (AMS) at 17 lb/100 gal. DO NOT apply *Zidua PRO* after soybean emergence or severe crop injury will occur. DO NOT apply to coarse textured soils with less than or equal to 2% organic matter, unless soybean is planted 1 month after application. DO NOT tank-mix or apply *Zidua PRO* within 30 days of preemergence applications of flumioxazin (*Valor*), sulfentrazone (*Authority* or *Spartan*), fomesafen (*Reflex*), or clomazone (*Command*) containing products. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications and **Table 2A** for residual weed control. Consult label and Table 12 for crop rotation restrictions. *Zidua PRO* should be tank-mixed with glyphosate, or glyphosate + 2,4-D ester to broaden the spectrum of burndown weed control.

**Zone Defense (77.2 WG):** *Zone Defense* can be applied in the **Fall, EPP**, or **PRE** to control existing vegetation and to provide residual weed control. *Zone Defense* contains *Spartan* (sulfentrazone) and *Valor* (see **Table 2C**). *Zone Defense* use rates are based on soil texture, organic matter, and pH. Use rates range from 3.5 to 5 oz/A for coarse textured soils; 4.5 to 6 oz/A for medium textured soils; and 5 to 6.6 oz/A for fine textured soils. For soils with less than 2% organic matter use the lowest rate for that specific soil texture. DO NOT use on coarse soils classified as sand which have less than 1% organic matter. Always add a crop oil concentrate at 1% v/v + ammonium sulfate. A methylated seed oil or non-ionic surfactant can also be substituted. Consult **Table 2P** for maximum burndown weed heights and effectiveness ratings and **Table 2A** for residual weed control. DO NOT tank mix or apply with dimethenamid (*Outlook*), or acetochlor (*Warrant*) products. *Zone Defense* at 5 oz/A or less can be tank-mixed with metolachlor (*Dual*). The effectiveness of *Zone Defense* is greater the closer it is to planting. Consult the label and Table 12 for crop rotation restrictions. *Zone Defense* should be tank mixed with 2,4-D ester, glyphosate, 2,4-D ester + glyphosate, *Gramoxone*, or *Liberty* to broaden the spectrum of burndown weed control.

## Table 2Q – Weed Management in No-Till Soybean (continued)

### Burndown Herbicides in Enlist E3 Soybean

**Enlist One (3.3 L):** *Enlist One* (2,4-D choline) can be applied in the **Fall, EPP** or **PRE** in Enlist E3 soybean to control existing annual, biennial and perennial broadleaf weeds. Apply *Enlist One* at 1.5 to 2 pt/A to actively growing broadleaf weeds. *Enlist One* is effective at controlling several broadleaf weed species, including glyphosate-resistant horseweed. Consult the label and **Table 2H** for application requirements and precautions. Only labeled nozzles and tank-mixtures can be applied with *Enlist One*. Applicators must consult the label website: **EnlistTankmix.com** prior to tank mixing and application. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications.

**Enlist Duo (3.8 L):** *Enlist Duo* can be applied in the **Fall, EPP** or **PRE** in Enlist E3 soybean to control existing vegetation. *Enlist Duo* contains 2,4-D choline and glyphosate (see **Table 2C**). Apply *Enlist Duo* at 3.5 to 4.75 pt/A to actively growing weeds. *Enlist Duo* is effective at controlling several weed species, including glyphosate-resistant horseweed. Consult the label and **Table 2H** for application requirements and precautions. Only labeled nozzles and tank-mixtures can be applied with *Enlist Duo*. Applicators must consult the label website: **EnlistTankmix.com** prior to tank mixing and application. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications.

### Burndown Herbicides in Roundup Ready 2 Xtend or XtendFlex Soybean

**Engenia (5 L):** *Engenia* (dicamba) can be applied in the **Fall, EPP** or **PRE** to Roundup Ready 2 Xtend or XtendFlex soybean to control existing vegetation. A short period of residual activity on certain small seeded broadleaf weeds is possible, but is dependent on weather conditions. Apply *Engenia* at 12.8 oz/A to actively growing broadleaf weeds. *Engenia* is effective at controlling several broadleaf weed species, including glyphosate-resistant horseweed. *Engenia* is a Restricted Use Pesticide and has several restrictions for use. Consult the label and **Table 2I** for application requirements and precautions. Only labeled nozzles and tank-mixtures can be applied with *Engenia*. Applicators must consult the label website: **engeniataankmix.com** prior to tank mixing and application. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications.

**XtendiMax (2.9 L):** *XtendiMax* (dicamba) can be applied in the **Fall, EPP** or **PRE** to Roundup Ready 2 Xtend or XtendFlex soybean to control existing vegetation. A short period of residual activity on certain small seeded broadleaf weeds is possible, but is dependent on weather conditions. Apply *XtendiMax* at 22 oz/A to actively growing broadleaf weeds. *XtendiMax* is effective at controlling several broadleaf weed species, including glyphosate-resistant horseweed. *XtendiMax* is a Restricted Use Pesticide and has several restrictions for use. Consult the labels and **Table 2I** for application requirements and precautions. Only labeled nozzles and tank-mixtures can be applied with *XtendiMax*. Applicators must consult the label website: **xtendimaxapplicationrequirements.com** prior to tank mixing and application. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications.

**Tavium (3.4 L):** *Tavium* can be applied **EPP** or **PRE** to Roundup Ready 2 Xtend or XtendFlex soybean to control existing vegetation. *Tavium* contains *XtendiMax* (dicamba) and *Dual* (s-metolachlor) (see **Table 2C**). This combination provides additional residual activity on grasses and certain small seeded broadleaf weeds. Apply *Tavium* at 56.5 oz/A to actively growing broadleaf weeds. *Tavium* is effective at controlling several broadleaf weed species, including glyphosate-resistant horseweed. *Tavium* is a Restricted Use Pesticide and has several restrictions for use. Consult the label and **Table 2I** for application requirements and precautions. Only labeled nozzles and tank-mixtures can be applied with *Tavium*. Applicators must consult the label website: **TaviumTankMix.com** prior to tank mixing and application. Consult **Table 2Q** for maximum weed heights and effectiveness ratings for burndown applications.

## Effectiveness of Herbicides for No-Till Soybean

Fall or Spring Burndown	LENGTH OF CONTROL <sup>d</sup>	ANNUAL BROADLEAVES/ GRASSES											WINTER ANNUALS/ PERENNIALS								COVER CROPS					
		COCKLEBUR	JIMSONWEED	LAMBSQUARTERS	NIGHTSHADE (E. BLACK)	PIGWEED	RAGWEED (COMMON)	RAGWEED (GIANT)	SMARTWEED	VELVETLEAF	WILD MUSTARD	BARNYARDGRASS	FOXTAILS	CHICKWEED (COMMON)	DEADNETTLE	HENBIT	HORSEWEED (MARESTAIL)	PENNYCRESS	SHEPHERD'S-PURSE	YELLOW ROCKET	DANDELION	QUACKGRASS	RYE	WHEAT	CLOVER	HAIRY VETCH
Glyphosate (0.75 lb ae/A) <sup>a</sup>	0	6	6	6	6	6	6	6	6	6	6	6	<b>E</b>	F	<b>G</b>	N	<b>E</b>	<b>E</b>	<b>E</b>	<b>G</b> <sup>e</sup>	<b>G</b>	<b>E</b>	<b>E</b>	F	F	
Glyphosate (1.13 lb ae/A) <sup>a</sup>	0	12	12	12	12	12	12	12	12	12	12	12	<b>E</b>	<b>G</b>	<b>G</b>	N	<b>E</b>	<b>E</b>	<b>E</b>	<b>G</b> <sup>e</sup>	<b>G</b>	<b>E</b>	<b>E</b>	F	F	
Gramoxone SL 2.0 (2 pt/A) or Gramoxone SL 3.0 (1.33 pt/A)	0	3	3	3	3	3	3	-	3	3	3	3	<b>E</b>	P	<b>G</b>	P	<b>G</b>	<b>G</b>	<b>G</b>	P	P	F	F	P	P	
Gramoxone SL 2.0 (3 pt/A) or Gramoxone SL 3.0 (2 pt/A)	0	6	6	6	6	6	6	-	6	6	6	6	<b>E</b>	F	<b>G</b>	P	<b>E</b>	<b>E</b>	<b>E</b>	P	P	<b>G</b>	<b>G</b>	F	F	
Liberty (32 oz/A)	0	14	10	6	8	4	10	12	14	4	6	5	12	<b>E</b>	F	F	<b>G</b>	<b>G</b>	<b>G</b>	<b>G</b>	F	N	P	F	P	<b>G</b>
2,4-D ester <sup>b</sup> (1 pt/A)	0	3	-	3	3	3	3	-	2	3	-	-	P	P	P	<b>E</b>	<b>G</b>	<b>G</b>	<b>G</b>	P	N	N	N	F	F	
2,4-D ester <sup>c</sup> (1 qt/A)	1	6	3	6	6	6	6	3	5	6	-	-	P	F	F	<b>E</b>	<b>E</b>	<b>E</b>	<b>E</b>	F	N	N	N	<b>G</b>	<b>G</b>	
Elevore (1 oz/A)	0	-	-	4	-	4	4	-	-	-	-	-	-	<b>G</b>	<b>G</b>	<b>G</b>	-	-	-	-	-	-	-	-	-	
Express (0.25 oz/A)	0	-	-	3	-	-	-	-	-	3	-	-	<b>E</b>	<b>G</b>	<b>G</b>	P	<b>G</b>	F	P	F	N	N	N	N	N	
Panoflex (0.3-0.6 oz/A)	0	-	-	3	-	-	-	-	3	3	-	-	<b>E</b>	<b>G</b>	<b>G</b>	P	<b>G</b>	<b>G</b>	<b>G</b>	<b>G</b>	N	N	N	-	P	
Aim + glyphosate (1 oz + 0.75 lb ae/A)	0	4	4	4	4	4	4	4	4	4	4	4	<b>G</b>	F	<b>G</b>	P	<b>E</b>	<b>E</b>	<b>E</b>	F	<b>G</b>	<b>E</b>	<b>E</b>	F	F	
Reviton + glyphosate (2 oz + 0.75 lb ae/A)	0	6	6	6	6	6	6	6	6	6	6	6	<b>E</b>	<b>G</b>	<b>G</b>	P	<b>E</b>	<b>E</b>	<b>E</b>	<b>G</b>	<b>G</b>	<b>E</b>	<b>E</b>	F	F	
Sharpen (1 oz/A)	0	6	-	6	6	6	6	6	6	6	-	-	F	P	P	<b>E</b>	<b>G</b>	<b>G</b>	<b>G</b>	P	N	N	N	F	N	
Sharpen + glyphosate (1 oz + 0.75 lb ae/A)	0	6	6	6	6	6	6	6	6	6	6	6	<b>G</b>	F	<b>G</b>	<b>E</b>	<b>E</b>	<b>E</b>	<b>E</b>	F	<b>G</b>	<b>E</b>	<b>E</b>	F	F	
Verdict + glyphosate (5 oz + 0.75 lb ae/A)	0	6	6	6	6	6	6	6	6	6	6	6	<b>G</b>	F	<b>G</b>	<b>E</b>	<b>E</b>	<b>E</b>	<b>E</b>	F	<b>G</b>	<b>E</b>	<b>E</b>	F	F	
Vida + glyphosate (1 oz + 0.75 lb ae/A)	0	4	-	4	4	4	4	4	4	-	-	-	<b>E</b>	F	<b>G</b>	F	<b>E</b>	<b>E</b>	<b>E</b>	F	<b>G</b>	<b>E</b>	<b>E</b>	F	F	
Afforia (2.5 oz/A)	2	-	-	3	-	3	-	-	3	-	-	-	<b>E</b>	<b>G</b>	<b>G</b>	P	<b>G</b>	<b>E</b>	<b>G</b>	F	N	N	N	P	P	
Authority Assist (10 oz/A)	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	N	N	N	N	

(Continued on next page)

P = Poor; F = Fair; **G** = Good; **E** = Excellent; N = None; - = Not labeled or recommended.

<sup>a</sup> See Table 10 for glyphosate products, formulations and rates. Lower glyphosate rates may be used for smaller weeds at lower spray volumes. Consult label.

<sup>b</sup> Wait a minimum of 7 days before planting soybean.

<sup>c</sup> Wait a minimum of 30 days before planting soybean.

<sup>d</sup> Length of summer weed control: 0 = no residual control; 1 = short residual control; 2 = moderate residual control; 3 = long residual control.

<sup>e</sup> Dandelion control from fall applications.

## Effectiveness of Herbicides for No-Till Soybean (continued)

Fall or Spring Burndown	LENGTH OF CONTROL <sup>d</sup>	ANNUAL BROADLEAVES/ GRASSES												WINTER ANNUALS/ PERENNIALS								COVER CROPS					
		COCKLEBUR	JIMSONWEED	LAMBSQUARTERS	NIGHTSHADE (E. BLACK)	PIGWEED	RAGWEED (COMMON)	RAGWEED (GIANT)	SMARTWEED	VELVETLEAF	WILD MUSTARD	BARNYARDGRASS	FOXTAILS	CHICKWEED (COMMON)	DEADNETTLE	HENBIT	HORSEWEED (MARESTAIL)	PENNYCRESS	SHEPHERD'S-PURSE	YELLOW ROCKET	DANDELION	QUACKGRASS	RYE	WHEAT	CLOVER	HAIRY VETCH	
																											Maximum Weed Height (inches)
Authority First/Sonic (6.4 oz/A)	2	10	4	-	-	-	8	10	6	6	2	-	-	P	P	P	N	<b>G</b>	F	F	P	N	N	N	P	P	
Authority MAXX (5 oz/A)	2	-	-	-	-	-	-	-	-	-	-	-	-	F	F	<b>G</b>	N	<b>G</b>	<b>G</b>	<b>G</b>	F <sup>e</sup>	N	P	P	P	P	
Authority MTZ (16 oz/A)	2	-	-	-	-	-	-	-	-	-	-	-	-	<b>G</b>	<b>G</b>	<b>G</b>	F	<b>G</b>	<b>G</b>	<b>G</b>	P	N	N	N	P	P	
Authority XL (4 oz/A)	3	-	-	3	3	3	3	3	3	-	3	1	1	F	F	<b>G</b>	N	<b>G</b>	<b>G</b>	<b>G</b>	<b>G</b> <sup>e</sup>	N	P	P	P	P	
Autumn Super (0.5 oz/A)	2	-	-	-	-	3	-	-	-	-	3	-	-	<b>G</b>	<b>G</b>	<b>G</b>	N	<b>G</b>	<b>G</b>	<b>G</b>	<b>G</b>	N	-	-	<b>G</b>	<b>G</b>	
Canopy (4.5 oz/A)	3	-	-	3	-	3	3	3	3	-	3	2	2	<b>G</b>	<b>G</b>	<b>G</b>	F	<b>E</b>	<b>E</b>	<b>E</b>	<b>G</b> <sup>e</sup>	N	P	P	P	P	
Canopy EX (1.65 oz/A)	c3	-	-	-	-	3	3	3	3	3	3	-	-	<b>E</b>	<b>G</b>	<b>G</b>	N	<b>E</b>	<b>E</b>	<b>E</b>	<b>G</b> <sup>e</sup>	N	P	P	P	P	
Dimetric Charged (12 oz/A)	2	3	3	3	-	3	-	-	3	3	3	-	-	<b>G</b>	<b>G</b>	<b>G</b>	F	<b>G</b>	<b>E</b>	<b>G</b>	F	N	N	N	P	P	
Envive (3.5 oz/A)	3	-	-	-	-	3	3	3	3	3	3	-	-	P	<b>G</b>	<b>G</b>	F	<b>E</b>	<b>E</b>	<b>E</b>	<b>G</b> <sup>e</sup>	N	P	P	P	P	
Extreme (3 pt/A)	2	18	6	8	12	18	9	9	6	5	18	6	18	<b>E</b>	F	<b>G</b>	N	<b>G</b>	<b>E</b>	<b>G</b>	F	<b>G</b>	<b>G</b>	<b>G</b>	<b>G</b>	P	P
Fierce EZ (6 oz/A)	2	-	-	-	-	-	-	-	-	-	-	-	-	P	F	F	P	<b>G</b>	<b>E</b>	<b>G</b>	F	N	N	N	P	P	
Fierce MTZ/Kyber (1 pt/A)	3	-	-	-	-	-	-	-	-	-	-	-	-	<b>G</b>	<b>G</b>	<b>G</b>	F	<b>G</b>	<b>E</b>	<b>G</b>	F	N	N	N	P	P	
Fierce XLT (4 oz/A)	3	-	-	-	-	-	-	-	-	-	-	-	-	P	<b>G</b>	<b>G</b>	F	<b>E</b>	<b>E</b>	<b>E</b>	<b>G</b> <sup>e</sup>	N	P	P	P	P	
FirstRate (0.6 oz/A)	2	10	4	-	-	-	8	10	6	6	2	-	-	P	P	P	N	<b>G</b>	F	F	P	N	N	N	P	P	
Flexstar GT 3.5 (3.5 pt/A)	1	4	4	4	4	4	4	4	4	4	6	6	18	<b>E</b>	<b>G</b>	<b>G</b>	N	<b>E</b>	<b>E</b>	<b>E</b>	F	<b>G</b>	<b>E</b>	<b>E</b>	F	F	
Linex/Lorox (1 pt/A)	2	6	-	6	-	-	6	-	6	6	6	2	2	<b>G</b>	P	P	P	P	P	P	P	P	P	P	P	P	P
Metribuzin (8 oz/A)	1	1	-	1	-	1	1	-	-	-	-	-	-	<b>G</b>	<b>G</b>	<b>G</b>	F	<b>G</b>	<b>G</b>	<b>G</b>	P	N	N	N	P	P	
OpTill (2 oz/A)	2	8	3	6	6	6	6	6	6	6	3	3-6	-	F	P	P	<b>E</b>	<b>G</b>	<b>G</b>	<b>G</b>	P	N	N	P	F	N	
Python (1.14 oz/A)	2	-	-	-	-	-	-	-	-	-	-	-	-	<b>G</b>	P	P	N	<b>G</b>	F	<b>G</b>	P	N	N	N	P	P	

(Continued on next page)

P = Poor; F = Fair; **G** = Good; **E** = Excellent; N = None; - = Not labeled or recommended.

<sup>a</sup> See Table 10 for glyphosate products, formulations and rates. Lower glyphosate rates may be used for smaller weeds at lower spray volumes. Consult label.

<sup>b</sup> Wait a minimum of 7 days before planting soybean.

<sup>c</sup> Wait a minimum of 30 days before planting soybean.

<sup>d</sup> Length of summer weed control: 0 = no residual control; 1 = short residual control; 2 = moderate residual control; 3 = long residual control.

<sup>e</sup> Dandelion control from fall applications.

## Effectiveness of Herbicides for No-Till Soybean (continued)

Fall or Spring Burndown	LENGTH OF CONTROL <sup>d</sup>	ANNUAL BROADLEAVES/ GRASSES											WINTER ANNUALS/ PERENNIALS								COVER CROPS					
		COCKLEBUR	JIMSONWEED	LAMBSQUARTERS	NIGHTSHADE (E. BLACK)	PIGWEEED	RAGWEED (COMMON)	RAGWEED (GIANT)	SMARTWEED	VELVETLEAF	WILD MUSTARD	BARNYARDGRASS	FOXTAILS	CHICKWEED (COMMON)	DEADNETTLE	HENBIT	HORSEWEED (MARESTAIL)	PENNYCRESS	SHEPHERD'S-PURSE	YELLOW ROCKET	DANDELION	QUACKGRASS	RYE	WHEAT	CLOVER	HAIRY VETCH
		Maximum Weed Height (inches)											Herbicide Effectiveness													
Sequence (2.5 pt/A)	2	12	12	6	6	12	12	12	6	6	18	6	18	<b>E</b>	F	<b>G</b>	N	<b>E</b>	<b>E</b>	<b>E</b>	F	<b>G</b>	<b>E</b>	<b>E</b>	F	F
Spartan Charge (8 oz/A)	2	-	3	3	3	-	-	3	3	3	-	-	-	-	-	-	<b>G</b>	<b>G</b>	<b>G</b>	P	N	-	-	-	-	
Surveil (3.5 oz/A)	2	10	4	-	-	-	8	10	6	6	2	-	-	P	F	F	N	<b>G</b>	<b>E</b>	<b>G</b>	F	N	N	N	P	P
Synchrony XP (1.5 oz/A)	3	-	-	3	-	3	3	3	3	3	-	-	P	<b>G</b>	<b>G</b>	N	<b>E</b>	<b>E</b>	<b>E</b>	<b>G</b> <sup>e</sup>	N	P	P	P	P	
Trivence (8 oz/A)	3	-	-	-	-	3	3	3	3	3	-	-	<b>G</b>	<b>G</b>	<b>G</b>	F	<b>E</b>	<b>E</b>	<b>E</b>	<b>G</b> <sup>e</sup>	N	P	P	P	P	
Valor/Valor EZ (2.5 oz/A)	2	-	-	-	-	-	-	-	-	-	-	-	P	F	F	P	<b>G</b>	<b>E</b>	<b>G</b>	F	N	N	N	P	P	
Valor XLT (4 oz/A)	3	-	-	-	-	-	-	-	-	-	-	-	P	<b>G</b>	<b>G</b>	P	<b>E</b>	<b>E</b>	<b>E</b>	<b>G</b> <sup>e</sup>	N	P	P	P	P	
Zidua PRO (6 oz/A)	2	8	3	6	6	6	6	6	6	6	-	-	F	P	P	<b>E</b>	<b>G</b>	<b>G</b>	<b>G</b>	P	N	N	P	F	N	
<b>ENLIST E3 SOYBEAN</b>																										
Enlist Duo (4.75 pt/A)	1	6	6	6	6	6	6	6	6	6	6	6	<b>E</b>	<b>G</b>	<b>G</b>	<b>E</b>	<b>E</b>	<b>E</b>	<b>E</b>	<b>E</b>	<b>G</b> <sup>e</sup>	<b>G</b>	<b>E</b>	<b>E</b>	<b>G</b>	<b>G</b>
Enlist One (2 pt/A)	1	6	3	6	6	6	6	6	6	6	-	-	P	F	F	<b>E</b>	<b>E</b>	<b>E</b>	<b>E</b>	F	N	N	N	<b>G</b>	<b>G</b>	
<b>XTEND and XTENDFLEX (DICAMBA-RESISTANT) SOYBEAN</b>																										
Engenia (12.8 oz)	1	4	4	4	4	4	4	4	4	4	-	-	F/ <b>G</b>	F	F	<b>E</b>	<b>E</b>	<b>G</b>	<b>E</b>	<b>G</b>	N	N	N	<b>E</b>	<b>G</b>	
XtendiMax (22 oz/A)	1	4	4	4	4	4	4	4	4	4	-	-	F/ <b>G</b>	F	F	<b>E</b>	<b>E</b>	<b>G</b>	<b>E</b>	<b>G</b>	N	N	N	<b>E</b>	<b>G</b>	
Tavium (56.5 oz/A)	2	4	4	4	4	4	4	4	4	4	-	-	F/ <b>G</b>	F	F	<b>E</b>	<b>E</b>	<b>G</b>	<b>E</b>	<b>G</b>	N	N	N	<b>E</b>	<b>G</b>	

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