

**Table 1. PRE and POST Herbicide Diversification Options for Glyphosate-Resistant Corn**

Prepared by Jeff Gunsolus (U of MN Weed Science), Tom Peters (U of MN / NDSU Weed Science)  
with input from Rich Zollinger, NDSU Weed Science



<b>Herbicides to Complement Glyphosate</b>						
<b>SOA #</b>	<b>PRE as part of sequential with glyphosate</b>	<b>Common ragweed</b>	<b>Giant ragweed</b>	<b>Lambsquarters</b>	<b>Kochia</b>	<b>Waterhemp</b>
5,15,27	Acuron	E	G	E	E	E
14,15	Anthem	P/F	P	F	P/F	E
5	Atrazine (0.38 lb ai/A)	G	F	G/E	G	G/E
27	Balance Flexx (Not labeled SE MN or North of I-94)	G/E	F/G	E	E	G
4	Banvel / Clarity (dicamba)	G	F	G	G	G
27	Callisto	G/E	G	G/E	P	G/E
2,27	Corvus (Not labeled in SE MN or North of I-94)	G-E	G-E	E	E	E
14,15	Fierce	P/F	P/F	F/G	F/G	G/E
15	Harness / Surpass / Breakfree NXT (acetochlor)	F	P	F/G	F	G/E
15	Other Acetamides (Dual, Outlook, Cinch)	P	P	P/F	N/P	G
2,4	Hornet WDG	G/E	F/G	G	F	P/F
2,27	Instigate	F/G	F/G	G/E	P	G/E
5,15,27	Lumax EZ	G/E	G	G/E	G/E	E
2,27	Prequel (ND only)	G/E	F/G	E	E	G
14	Sharpen (2-4 oz/A)	G/E	G	E	E	G/E
2,4,15	SureStart II / TripleFLEX II	G/E	F/G	E	F/G	F/G
14,15	Verdict (10 - 18 fl oz/A)	G/E	G	G/E	G/E	G/E
15	Zidua (2-4 oz/A)	P/F	P	F	F	G/E
<b>POST as part of tank mix with glyphosate</b>						
5	Atrazine (0.38 lb ai/A)	G/E	G	E	E	G
4	Banvel / Clarity (dicamba)	G/E	G	G	G/E	G
6	Buctril	G/E	F/G	G	G/E	F
14	Cadet	P	P	F	P/F	F
27	Callisto	G	G	G/E	P/F	G/E
2,27	Capreno	G	G	G/E	E	G/E
4	Diflexx	G/E	G	G	G/E	G
9,15,27	Halex GT	G	G	G/E	G/E	G/E
2,4	Hornet WDG	G/E	G/E	P/F	F/G	P/F
27	Impact / Armezon	G	G	G/E	E	G/E
27	Laudis	G	G	G/E	E	G/E
2	Permit	P/G	P/G	P	P/G	P/G
2,27	Realm Q	F/G	F/G	G/E	P/F	G/E
2,4	Resolve Q	P	P	F	P/E	P/G
14	Resource	F	P	F	P	F
4,19	Status	G/E	G/E	G/E	E	G
14,27	Solstice	F/G	F/G	G	P/F	G/E
4	2,4-D	E	G/E	E	P	F/G
<b>Alternative Technologies</b>						
10	Liberty 280 in LL Corn	G/E	G/E	F	E	G

E = Excellent Control G = Good Control F = Fair Control P = Poor Control N = No Control

SOA = Site of action is defined as the biochemical site at which the herbicide binds to control a plant

**Note: strengths and weakness and PRO's and CON's of PRE's such as crop injury potential under cool/wet conditions**

**Note: problems with timing, crop injury potential, and vol. crops of POST herbicides**

**Note: problems with timing, crop injury potential, and off-target injury of tank mixtures**

**Table 2. PRE and POST Herbicide Diversification Options for Glyphosate-Resistant Corn - Crop Rotation**

Prepared by Jeff Gunsolus (U of MN Weed Science), Tom Peters (U of MN / NDSU Weed Science)  
with input from Rich Zollinger, NDSU Weed Science



Herbicides to Complement Glyphosate							
SOA #	PRE as part of sequential with glyphosate	Herbicide Crop Rotation Interval (Months)					
		Dry bean	Pea	Potato	Soybean	Sugarbeet	Wheat
5,15,27	Acuron	10	18	10	10	18	4
14,15	Anthem	11	8	4	0	15	4
5	Atrazine (0.38 lb ai/A)	NCS	NCS	NCS	12	NCS b	NCS
27	Balance Flexx (Not labeled SE MN or North of I-94)	18	18	6	6	18	4
4	Banvel / Clarity (dicamba)	4	4	4	4	4	0
27	Callisto	18	10/18 [see label]	10	10	18	4
2,27	Corvus (Not labeled in SE MN or North of I-94)	17-24 [see label]	17-24 [see label]	17-24 [see label]	9	17-24 [see label]	4
14,15	Fierce	11	6	4	0	15	4
15	Harness / Surpass (acetochlor)	NCS	NCS	NCS	NCS	NCS	4
15	Other Acetamides (Dual, Outlook)	0	NCS	0	0	NCS	4 to 4.5
2,4	Hornet WDG	10.5 [see label]	10.5 [see label]	18	10.5	26 b	4
2,27	Instigate	18	18	10	10	18	9
5,15,27	Lumax EZ	18	18	18	NCS	18	NCS
2,27	Prequel (ND only)	18	18	6	10	18	4(Fall)/9(Sp)
14	Sharpen (2-4 oz/A)	6-Apr	0-2	6-May	2-Jan	7-May	0
2,4,15	SureStart II / TripleFLEX II	18	NCS	18	NCS	26 b	4
14,15	Verdict (10 - 18 fl oz/A)	NCS	NCS	NCS	NCS	NCS	NCS
15	Zidua (2-4 oz/A)	11	6	4	0	12	4 to 6
<b>POST as part of tank mix with glyphosate</b>							
5	Atrazine (0.38 lb ai/A)	NCS	NCS	NCS	12	NCS b	2CS
4	Banvel / Clarity (dicamba)	4	4	4	4	4	4
6	Buctril	1	1	1	1	1	1
14	Cadet	NCS	NCS	NCS	0	NCS	NCS
27	Callisto	18	18	10	10	18	4
2,27	Capreno	18 [see label]	18 [see label]	18 [see label]	10	(24) [see label]	4
4	Diflexx	4	4	4	4	4	4
9,15,27	Halex GT	18	18	10	10	18	4
2,4	Hornet WDG	10.5 [see label]	10.5 [see label]	18	10.5	26 b	4
27	Impact/Armezon	18 / 9 [0.5oz/A]	9	9	9	9 [0.5 fl oz/A] / (18)	3
27	Laudis	10 to 18 [see label]	10	10	8	10 [20" rain] / (18)	4
2	Permit	9	9	9	9	36	2
2,27	Realm Q	18	18	10	10	18	9
2,4	Resolve Q	10	10	0	10	10/18 [see label]	9
14	Resource	1	1	1	0	1	1
4,19	Status	4	4	4	1 to 4	4	1 to 4
14,27	Solstice	18	18	10	10	18	4
4	2,4-D	NCS	NCS	NCS	7 to 30 Days	NCS	NCS
<b>Alternative Technologies</b>							
10	Liberty in LL Corn	6	6	70d	0	0	70d

SOA = Site of action is defined as the biochemical site at which the herbicide binds to control a plant

NCS = Next Cropping Season

2CS = 2 Cropping Seasons

( ) = Recommended interval

Shading = Herbicides requiring ≥2 years before planting sugarbeets

b = including a successful bioassay

**Table 3. PRE and POST Herbicide Diversification Options for Glyphosate-Resistant Soybean**

Prepared by Jeff Gunsolus (U of MN Weed Science), Tom Peters (U of MN / NDSU Weed Science) with input from Rich Zollinger, NDSU Weed Science



<b>Herbicides to Complement Glyphosate</b>						
<b>SOA #</b>	<b>PRE as part of sequential with glyphosate</b>	<b>Common ragweed</b>	<b>Giant ragweed</b>	<b>Lambsquarters</b>	<b>Kochia</b>	<b>Waterhemp</b>
2,14	Authority Assist	F	P	E	E	G/E
14,15	Authority Elite / BroadAxe XC	N	N	E	E	G/E
2,14	Authority First / Sonic	G/E	G	G/E	G/E	G/E
5,14	Authority MTZ	G	P/F	G	G/E	G/E
5,15	Boundary	G	P/F	G	P	G/E
14,15	Fierce	F	P/F	F/G	F/G	G/E
5	Metribuzin (generic Sencor)	G	P	P/F	F/G	F/G
2,14	Optill	G	F/G	G	P/G	F/G
2,14,15	Optill PRO	G	F/G	G	F/G	G/E
3	Prowl	P	P	G	P	F/G
14	Sharpen (1 oz/A)	P/F	P	P/F	P/F	F
14	Spartan	P	N	E	E	F/E
2,14	Surveil	G/E	G	G/E	G	G
3	Treflan/Sonalan	P	P	G/E	P	G
14	Valor / Rowel	N/F	N/P	G/E	G/E	G/E
14,15	Verdict (5 fl oz/A)	P/F	P	P/G	P/F	F/G
<b>PRE and/or Early POST as tank mix with glyphosate (PRE to Weeds)</b>						
15	Acetamides (Dual, Outlook)	P	P	P/F	N/P	F/G
14,15	Anthem	P/F	P	F	P/F	E
14,15	Prefix (E. of I-29 and S. of I-94 Only)	G	F	G	F	G/E
15	Warrant	F	P	F/G	F	G/E
14,15	Warrant Ultra (E. of I-29 and S. of I-94 Only)	G	F	G	F	G
15	Zidua (1-3.5oz/A)	P/F	P	F	F/G	G/E
<b>POST as part of tank mix with glyphosate</b>						
14	Cadet	P	P	F	P/F	F
2	Classic (MN Only)	G	F/G	P	P	P
14	Cobra / Phoenix	G/E	G	P	P/F	G/E
2	FirstRate	E	E	P	P	P
14	Flexstar ( Maximum rate depends on location)	G/E	G	P/F	G/E	G/E
9,14	Flexstar GT (E. of I-29 and S. of I-94 Only)	G/E	G	G/E	G/E	G/E
2	Harmony SG	P/F	P	G/E	F/G	P/G
14,14	Marvel (E. of I-29 and S. of I-94 Only)	G/E	G	P/F	G/E	G/E
2	Pursuit	P	P	P/F	P/G	P/E
14	Resource	F	P	F	P	F
2,2	Synchrony XP (MN Only)	G	F/G	G/E	P/E	P/G
14	Ultra Blazer	G	F	F	P/F	G
<b>Alternative Technologies</b>						
10	Liberty 280 in LL Soybean	G/E	G/E	F	E	G

E = Excellent Control G = Good Control F = Fair Control P = Poor Control N = No control

SOA = Site of action is defined as the biochemical site at which the herbicide binds to control a plant

**Note: strengths and weakness and PRO's and CON's of PRE's such as crop injury potential under cool/wet conditions**

**Note: problems with timing, crop injury potential, and vol. crops of POST herbicides**

**Note: problems with timing, crop injury potential, and off-target injury of tank mixtures**

**Table 4. PRE and POST Herbicide Diversification Options for Glyphosate-Resistant Soybean - Crop Rotation**

Prepared by Jeff Gunsolus (U of MN Weed Science), Tom Peters (U of MN / NDSU Weed Science)

with input from Rich Zollinger, NDSU Weed Science



Herbicides to Complement Glyphosate		Herbicide Crop Rotation Interval (Months)					
SOA #	PRE as part of sequential with glyphosate	Corn	Pea	Dry bean	Potato	Sugarbeet	Wheat
2,14	Authority Assist	10	4	4	26	40 b	4
14,15	Authority Elite / BroadAxe XC	10	0	0	4	36	4.5
2,14	Authority First / Sonic	10	12	12	18	30 b	4
5,14	Authority MTZ	10	18	12	12	36	4
5,15	Boundary	8	8	12	0	18	8
14,15	Fierce	1	6	11	4	15	1 to 2
2	FirstRate	9	9	9	18	30 b	4
5	Metribuzin (generic Sencor)	4	8	2	12	18	8
2,14	Optill	8.5	4	4	26	40 b	4
2,14,15	Optill PRO	8.5	4	4	26	40 b	4
3	Prowl	0	0	0	0	12 (2CS)	NCS
14	Sharpen (1 oz/A)	0	0	4	4	4	0
14	Spartan	10	0	0	4	36	4
2,14	Surveil	9	9	9	18	30 b	3
3	Treflan	NCS	0	0	0	12 (2CS)	NCS
14	Valor / Rowel	0.5-1	3-4	3-4	0	4-10	1-2
14,15	Verdict (5 fl oz/A)	0	0	4	4	4	0
<b>PRE and/or Early POST as tank mix with glyphosate (PRE to Weeds)</b>							
15	Acetanalides (Dual, Outlook)	0	NCS	0	0	NCS	4 to 4.5
14,15	Anthem	0	11	11	4	12 to 15	4
14,15	Prefix ( <b>E. of I-29 and S. of I-94 Only</b> )	10	10	0	0	18	4.5
15	Warrant (PRE to weeds)	NCS	NCS	NCS	NCS	NCS	4
14,15	Warrant Ultra ( <b>E. of I-29 and S. of I-94 Only</b> )	10	10	NCS	NCS	18	4
15	Zidua (> 2.0 oz/A)	0	4-8	11	4	12-15	0-6
<b>POST as part of tank mix with glyphosate</b>							
14	Cadet	0	NCS	NCS	NCS	NCS	NCS
2	Classic ( <b>MN Only</b> )	9	9	9	30	30	3
14	Cobra / Phoenix	0	0	0	0	0	0
2	FirstRate	9	9	9	18	30 b	4
14	Flexstar ( <b>Maximum rate depends on location</b> )	10	10	0	0	18	4
9,14	Flexstar GT ( <b>E. of I-29 and S. of I-94 Only</b> )	10	10	0	0	18	4
2	Harmony SG	0	45 days	45 days	45 days	45 days	0
14,14	Marvel ( <b>E. of I-29 and S. of I-94 Only</b> )	10	10	0	0	18	4
2	Pursuit	8.5	4	4	26	40 b	4
2	Raptor	8.5	0	0	9 to 18	18 to 26	3
14	Resource	0	1	1	1	1	1
2,2	Synchrony XP ( <b>MN Only</b> )	9	9	9	30	30	3
14	Ultra Blazer	100 days	100 days	100 days	100 days	100 days	40 days
<b>Alternative Technologies</b>							
10	Liberty in LL Soybean	0	6	6	70d	0	70d

SOA = Site of action is defined as the biochemical site at which the herbicide binds to control a plant

**NCS = Next Cropping Season**

**2CS = 2 Cropping Seasons**

**( ) = Recommended interval**

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