



Weed Control Comparison with XtendFlex[®] Soybeans

Trial Objective

- The Roundup Ready[®] Xtend Crop System with XtendFlex[®] soybeans provides growers with soybean products that have herbicide tolerance to glufosinate, glyphosate, and dicamba.
- In 2020, two herbicide tolerant soybean platforms launched, Enlist E3[®] soybeans and LibertyLink[®] GT27[™] soybeans.
 - Enlist E3[®] soybeans confer tolerance to 2,4-D choline, glyphosate, and glufosinate that allows growers to use Enlist Duo[®] herbicide or Enlist One[®] herbicide to control weeds.
 - LibertyLink GT27 soybeans have tolerance to glyphosate, glufosinate, and isoxaflutole. To date, Alite 27[®] is the only group 27 herbicide product registered for use on GT27[™] soybeans.
- The objective of the trial was to evaluate the three soybean systems: Roundup Ready[®] Xtend Crop System with XtendFlex soybeans, the Enlist[™] weed control system with Enlist E3 soybeans, and the GT27[™] Soybean Performance with LibertyLink G27 soybeans.

Research Site Details

Location	Soil Type	Previous Crop	Tillage Type	Planting Date	Harvest Date	Potential Yield (bu/acre)	Seeding Rate (seeds/acre)
Salina, KS	Silt loam	Corn	Conventional	05/20/2020	10/05/20	50	160,000
Gothenburg, NE	Silt loam	Corn	Strip till	05/08/2020	10/20/20	50	160,000

- Single replication demonstrations were planted on sites with very high Palmer amaranth pressure.
- Plot size was 10 by 243 feet at Salina, KS and 10 by 250 feet at Gothenburg, NE.
- Three soybean products for each weed control platform were used. The maturity groups ranged from 3.6 to 4.2 at Salina and 2.5 to 3.0 at Gothenburg.
- Herbicide application dates
 - Salina
 - Pre-emergence (PRE): May 20
 - Early Post (EPOST): June 9
 - Late Post (LPOST): July 6
 - Gothenburg
 - PRE: May 8
 - EPOST: June 18
 - LPOST: July 2
- Herbicide treatments included in Table 1, 2, and 3.



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Table 1. Roundup Ready [®] Xtend Crop System, XtendFlex [®] soybeans.				
Herbicide Treatment	Location(s)	Rate	Unit	Timing
XtendiMax [®] herbicide with VaporGrip [®] Technology, a Restricted Use Pesticide	Gothenburg, Salina	22	fl oz/acre	PRE
Warrant [®] Ultra herbicide	Gothenburg, Salina	48	fl oz/acre	PRE
Drift Reducing Adjuvant (DRA)	Gothenburg, Salina	0.5	% v/v	PRE
XtendiMax herbicide with VaporGrip Technology	Gothenburg, Salina	22	fl oz/acre	EPOST
Roundup PowerMAX [®] herbicide	Gothenburg, Salina	32	fl oz/a	EPOST
Warrant Ultra herbicide	Gothenburg, Salina	48	fl oz/acre	EPOST
Adjuvant	Gothenburg, Salina	1	% v/v	EPOST
DRA	Gothenburg, Salina	0.5	% v/v	EPOST
Liberty [®] 280 SL herbicide	Gothenburg, Salina	32	fl oz/acre	LPOST
Ammonium sulfate (AMS)	Gothenburg, Salina	3	% v/v	LPOST

Table 2. Enlist [™] weed control system, Enlist E3 [®] soybeans.				
Herbicide Treatment	Location(s)	Rate	Unit	Timing
Enlist One [®] herbicide with Colex-D [®] Technology	Gothenburg, Salina	22	fl oz/acre	PRE
Sonic [®] herbicide	Gothenburg, Salina	4	fl oz/acre	PRE
Enlist One herbicide With Colex-D Technology	Gothenburg, Salina	22	fl oz/acre	EPOST
Liberty [®] 280 SL herbicide	Gothenburg, Salina	32	fl oz/acre	EPOST
Dual II Magnum [®] herbicide	Gothenburg, Salina	16	fl oz/acre	EPOST
AMS	Gothenburg, Salina	3	% v/v	EPOST
Liberty [®] 280 SL herbicide	Salina	32	fl oz/acre	LPOST
AMS	Salina	2	% v/v	LPOST
Durango [®] DMA [®] Herbicide	Gothenburg	36	fl oz/acre	LPOST
AMS	Gothenburg	3	% v/v	LPOST

Table 3. GT27 [™] Soybean Performance System, LibertyLink [®] GT27 [™] soybeans.				
Herbicide Treatment	Location(s)	Rate	Unit	Timing
Verdict [®] herbicide, powered by Kixor [®] herbicide Technology	Gothenburg, Salina	5	fl oz/acre	PRE
Durango [®] DMA [®] herbicide	Gothenburg, Salina	36	fl oz/acre	EPOST
Liberty [®] 280 SL herbicide	Gothenburg, Salina	32	fl oz/acre	EPOST
Outlook [®] herbicide	Gothenburg, Salina	12	fl oz/acre	EPOST
AMS	Gothenburg, Salina	3	% v/v	EPOST
Liberty 280 SL Herbicide	Salina	32	fl oz/acre	LPOST
Durango DMA herbicide DMA	Salina	36	fl oz/acre	LPOST
AMS	Salina	2	% v/v	LPOST

- Weed control efficacy ratings were taken on a scale of 0 to 100% with 0 indicating no control and 100% indicating complete control of the evaluated weed species.
- Weed control efficacy ratings for each system were averaged across the three soybean products for each system for each rating date.
- Yields were low at both sites due to late season moisture stress and were not reported.



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Understanding the Results

- The early POST (EPOST) applications were applied to soybeans at the V4 growth stage when Palmer amaranth plants were approximately 4.5 inches tall.
- The late POST (LPOST) applications were applied to all soybeans prior the R1 growth stage when Palmer amaranth plants were approximately 2-12 inches tall. A disparity in weed height was observed in this trial because the EPOST Roundup Ready[®] Xtend Crop System with XtendFlex[®] soybeans treatment performed better than the other two EPOST systems.

Table 4. Percent Palmer amaranth control for each soybean crop production system (2020).						
Herbicide Treatment	Evaluation Date for Percent Palmer amaranth Control					
	Salina, KS			Gothenburg, NE		
Soybean Crop Production System	June 30 21 days after EPOST	July 17 11 days after LPOST	Near Harvest	July 2 14 days after EPOST	July 16 14 days after LPOST*	Near Harvest
Roundup Ready [®] Xtend Crop System treatments with XtendFlex [®] soybeans	82	94	97	96	98	98
Enlist [™] weed control system treatments with Enlist E3 [®] soybeans	72	70	58	90	75	70
GT27 [™] Soybean Performance System treatments with LibertyLink [®] G27 [™] soybeans	67	68	57	93	60	50

*Palmer amaranth was not initially controlled from the EPOST application for the Enlist[™] and GT27[™] systems. In addition, subsequent flushes of Palmer amaranth gave the impression of poor control across the plot due to the rapid growth of Palmer amaranth.

Roundup Ready[®] Xtend Crop System with XtendFlex[®] Soybeans



The Enlist[™] Weed Control System with Enlist E3[®] Soybeans



Soybean Performance with LibertyLink[®] G27[™] Soybeans



Figure 1. Images of the soybean weed control systems 26 days after late post application, July 28, 2020 at Gothenburg, NE.



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Key Learnings

- Early season weed control efficacy initially appeared to be similar between the three weed control systems at both sites with a small advantage for the Roundup Ready® Xtend Crop System with XtendFlex® soybeans platform.
- Differences in weed efficacy became more apparent as the growing season continued with the XtendFlex® platform showing better weed control efficacy at both the mid-season and pre-harvest observations.
- Palmer amaranth is a difficult weed for farmers to control effectively. A system like the Roundup Ready® Xtend Crop System with XtendFlex® soybeans that can help provide season-long control by layering residuals is one way to help achieve effective weed control.
- Farmers should visit with their local Bayer Crop Science Sales Representative about the possible benefits the Roundup Ready® Xtend Crop System with XtendFlex® soybeans platform can bring to their operation.

Legal Statements

The information discussed in this report is from a multiple site, single replicated demonstration. This informational piece is designed to report the results of this demonstration and is not intended to infer any confirmed trends. Please use this information accordingly.

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XtendiMax® herbicide with VaporGrip® Technology is part of the Roundup Ready® Xtend Crop System, is a restricted use pesticide and must be used with VaporGrip® Xtra Agent (or an equivalent vapor reducing agent). For approved tank-mix products (including VRAs and DRAs), nozzles and other important label information visit XtendiMaxApplicationRequirements.com.

ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. It is a violation of federal and state law to use any pesticide product other than in accordance with its labeling. NOT ALL formulations of dicamba or glyphosate are approved for in-crop use with Roundup Ready 2 Xtend® soybeans. NOT ALL formulations of dicamba, glyphosate or glufosinate are approved for in-crop use with products with XtendFlex® Technology. ONLY USE FORMULATIONS THAT ARE SPECIFICALLY LABELED FOR SUCH USES AND APPROVED FOR SUCH USE IN THE STATE OF APPLICATION. Contact the U.S. EPA and your state pesticide regulatory agency with any questions about the approval status of dicamba herbicide products for in-crop use with Roundup Ready 2 Xtend® soybeans or products with XtendFlex® Technology.

Performance may vary, from location to location and from year to year, as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible and should consider the impacts of these conditions on the grower's fields.

Roundup Ready 2 Xtend® soybeans contain genes that confer tolerance to glyphosate and dicamba. Products with XtendFlex® Technology contains genes that confer tolerance to glyphosate, glufosinate and dicamba. Glyphosate will kill crops that are not tolerant to glyphosate. Dicamba will kill crops that are not tolerant to dicamba. Glufosinate will kill crops that are not tolerant to glufosinate. Contact your seed brand dealer or refer to the Bayer Technology Use Guide for recommended weed control programs.

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