Soybean Weed Control System Comparison in Nebraska

Trial Objective

- This trial compared the effect of four different weed control systems, LibertyLink® GT27™ soybeans, Enlist E3® soybeans, Roundup Ready 2 Xtend® soybeans, and XtendFlex® soybeans on glyphosate-resistant (GR) Palmer amaranth control, soybean injury, and soybean yield potential.

Research Site Details

Location	Soil Type	Previous Crop	Tillage Type	Planting Date	Harvest Date	Seeding Rate (seeds/acre)
Gothenburg, NE	Silty loam	Corn	Conventional	5/13/19	10/18/19	160K

- For each trait system, three soybean products were planted in strips that were four rows wide and 200 feet long per soybean product.
- LibertyLink® GT27™ soybean product RMs ranged from 2.2 to 2.9, Enlist E3® soybean product RMs ranged from 2.4 to 3.0, Roundup Ready 2 Xtend® soybean product RMs ranged from 2.4 to 3.2, and XtendFlex® soybean product RMs ranged from 2.3 to 2.7.
- Each soybean product for a given trait received the same herbicide treatments (Table 1).
- Preemergence (PRE) treatments were applied one day after soybean planting and postemergence (POST) treatments were applied at the V3 soybean growth stage when Palmer amaranth plants were four to six inches tall.
- Plots were visually evaluated for percent GR palmer amaranth control and soybean injury.

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Table 1. Herbicide treatment list.					
Weed Control Trait	Application Timing	Herbicide	Rate per Acre	Nozzle	Spray Volume (gallons/acre)
LibertyLink® GT27™ soybeans	PRE	Verdict®	5 fl oz	XR 11002	20
	POST	Liberty® 280 SL Durango® DMA® Outlook® Amsol™	32 fl oz 36 fl oz 12 fl oz 3% v/v	XR 11002	20
Enlist E3® soybeans	PRE	Enlist One® Sonic®	24 fl oz 4 oz	TTI 110015	15
	POST	Enlist Duo® Dual II Magnum® Class Act® Ridion®	76 fl oz 16 fl oz 1% v/v	TTI 110015	15
Roundup Ready 2 Xtend® soybeans	PRE	XtendiMax® herbicide with VaporGrip® Technology Warrant® Mauler™	22 fl oz 48 fl oz 8 fl oz	TTI 110015	15
	POST	XtendiMax with VaporGrip Technology Roundup PowerMAX® Warrant INTACT™ Class Act Ridion	22 fl oz 32 fl oz 48 fl oz 0.5% v/v 1% v/v	TTI 110015	15
XtendFlex® soybeans	PRE	XtendiMax with VaporGrip Technology Warrant® Ultra INTACT	22 fl oz 48 fl oz 0.5% v/v	TTI 110015	15
	POST	XtendiMax with VaporGrip Technology Roundup PowerMAX Warrant INTACT Class Act Ridion	22 fl oz 32 fl oz 48 fl oz 0.5% v/v 1% v/v	TTI 110015	15

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Understanding the Results

Figure 1. (left) LibertyLink® GT27™ soybeans 16 days after the POST application, (middle) LibertyLink® GT27™ soybeans 34 days after the POST application, and (right) LibertyLink® GT27™ soybeans at harvest.

Figure 2. (left) Enlist E3® soybeans 16 days after the POST application, (middle) Enlist E3® soybeans 34 days after the POST application, and (right) Enlist E3® soybeans at harvest.

Figure 3. (left) Roundup Ready 2 Xtend® soybeans 16 days after the POST application, (middle) Roundup Ready 2 Xtend® soybeans 34 days after the POST application, and (left) Roundup Ready 2 Xtend® soybeans at harvest.

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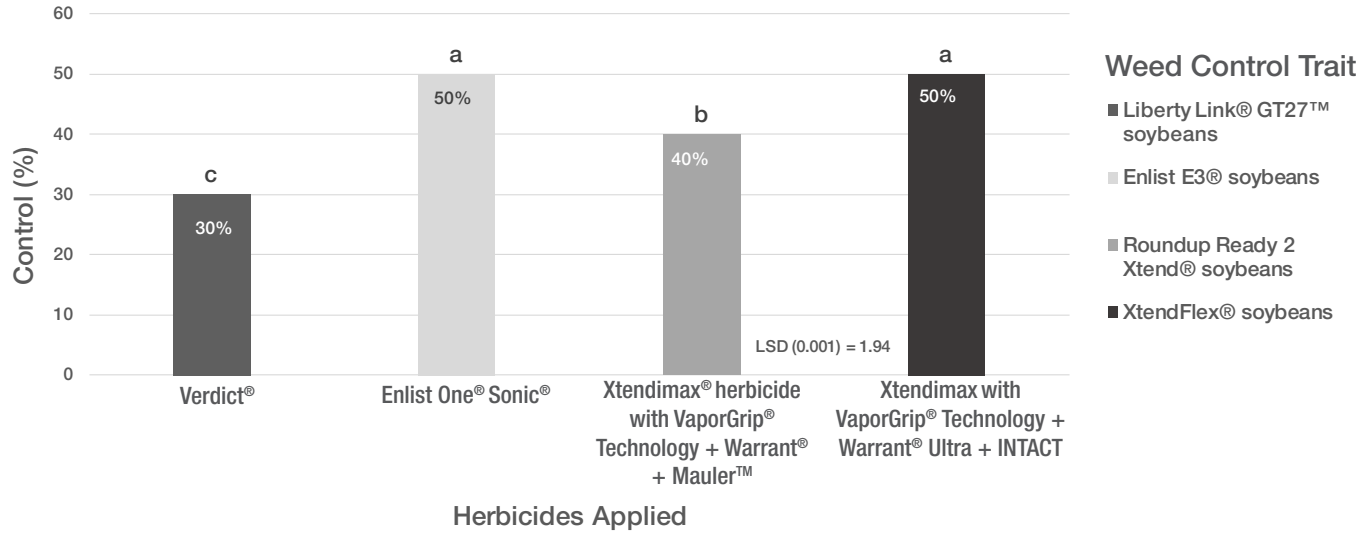

Figure 4. GR-Palmer amaranth control 42 days after the PRE application. Different letters above the bars indicate significant differences.(p<0.001).

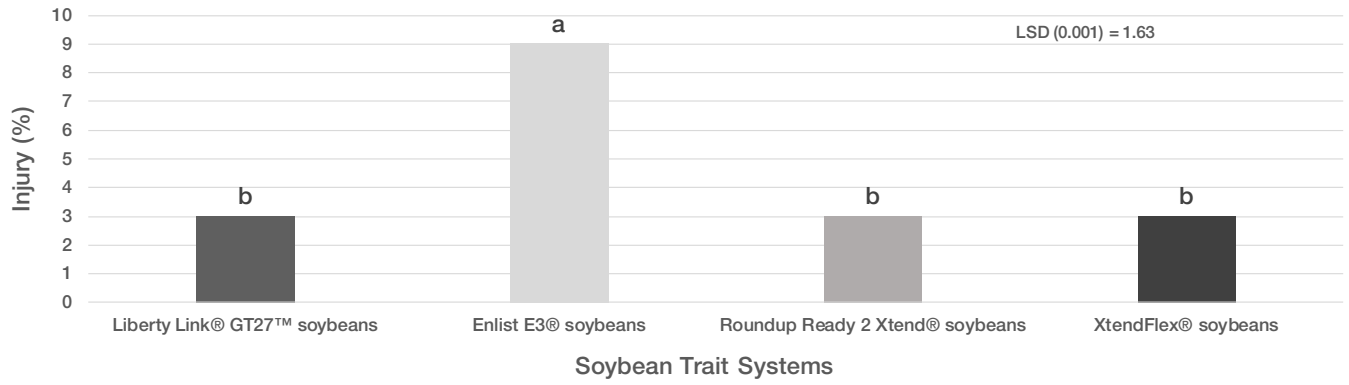

Figure 5. Soybean injury 14 days after the POST application. Different letters above the bars indicate significant differences. The data represent the average of the three soybean products used in each trait system.

Soybean Weed Control System Comparison in Nebraska

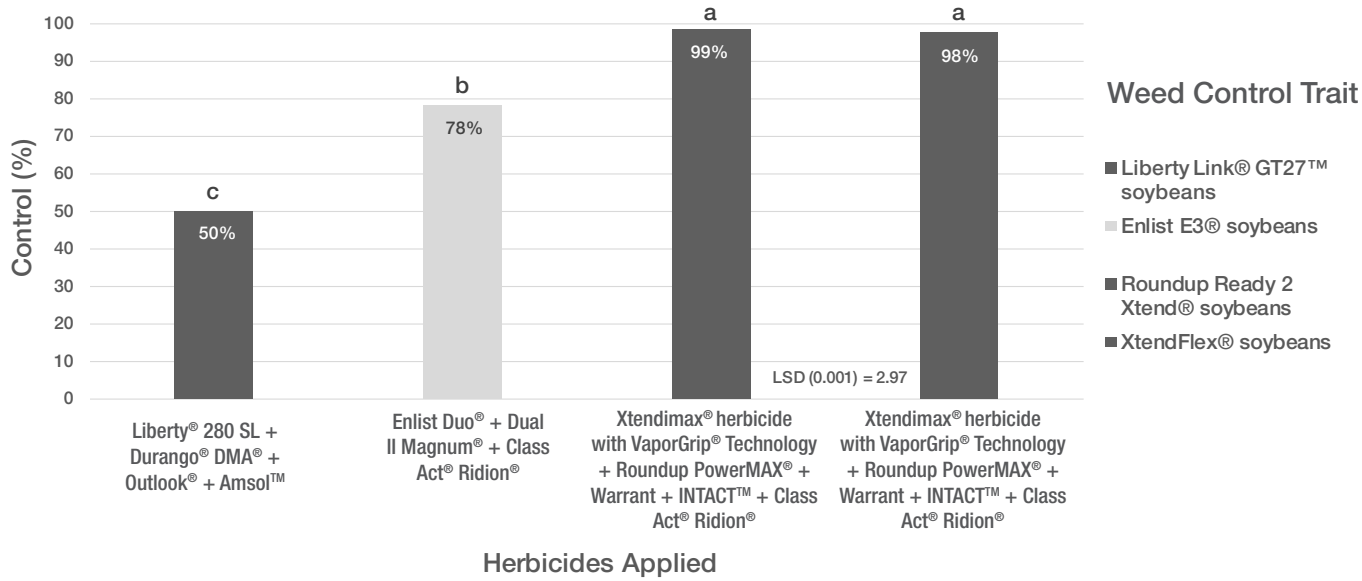

Figure 6. GR-Palmer amaranth control 37 days after the POST application. Different letters above the bars indicate significant differences. (p<0.001).

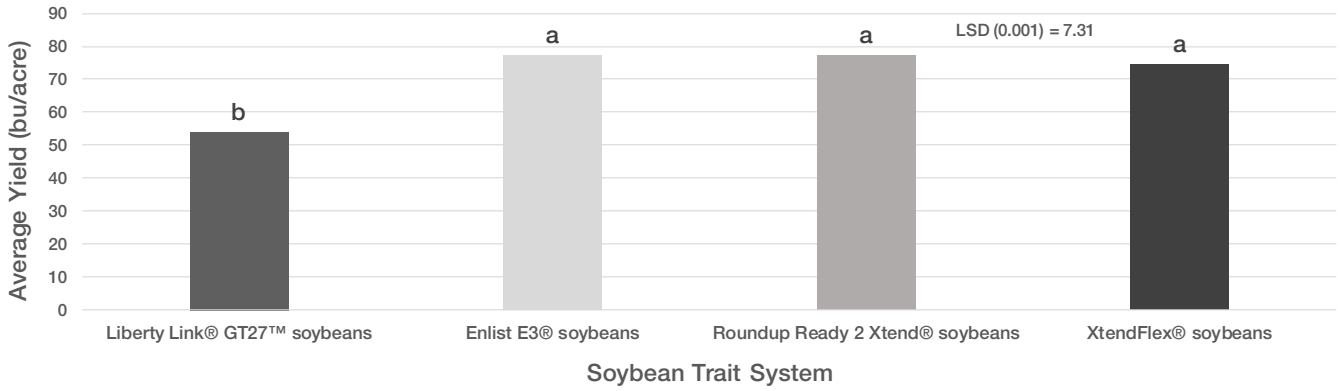

Figure 7. Average soybean yield of the three soybean products used in each trait system. Different letters above the bars indicate significant differences. The data represent the average of the three soybean products used in each trait system.

- At 42 days after the PRE treatments, Palmer amaranth control ranged from 30 to 50% across systems (Figure 4), which led to heavy pressure at the POST application timing at this location.
- No soybean injury was observed from the PRE treatments, but soybean injury from the POST treatments was significantly ($p<0.001$) higher in the Enlist E3® soybean system compared to other 3 systems at this location (Figure 5).
- At 37 days after the POST treatments, Palmer amaranth control was significantly ($p<0.001$) higher in the Roundup Ready 2 Xtend® (98%) and XtendFlex® (97%) soybean systems compared to the Enlist E3® (78%) or LibertyLink® GT27™ (50%) soybean systems (Figure 6).
- Roundup Ready 2 Xtend® and XtendFlex® soybean yields were significantly higher than LibertyLink® GT27™at this location ($p<0.001$) (Figure 7).

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Key Learnings

- To manage tough-to-control weeds like Glyphosate-resistant Palmer amaranth, it is essential to choose a herbicide program that provides effective foliar and residual control.
- Glyphosate resistant Palmer amaranth control was significantly higher in the Roundup Ready 2 Xtend® and XtendFlex® soybean systems than in the Enlist E3® and LibertyLink® GT27™ soybean systems at this location in 2019.

Legal Statements

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XtendiMax® herbicide with VaporGrip® Technology is part of the Roundup Ready® Xtend Crop System and is a restricted use pesticide. 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. XtendiMax® herbicide with VaporGrip® Technology and products with XtendFlex® Technology may not be approved in all states and may be subject to use restrictions in some states. Check with your local product dealer or representative or U.S. EPA and your state pesticide regulatory agency for the product registration status and additional restrictions in your state. For approved tank-mix products and nozzles visit XtendiMaxApplicationRequirements.com.

NOT ALL formulations of dicamba or glyphosate are approved for in-crop use with Roundup Ready 2 Xtend® soybeans. 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 cotton with XtendFlex® Technology.

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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. Glyphosate will kill crops that are not tolerant to glyphosate. Dicamba will kill crops that are not tolerant to dicamba. Contact your seed brand dealer or refer to the Monsanto Technology Use Guide for recommended weed control programs.

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WEED CONTROL