



Volunteer Corn Control in Roundup Ready 2 Xtend[®] Soybeans

Trial Objective

- The objective of this study was to determine the influence of clethodim rate (Select Max[®] herbicide) and adjuvant type on volunteer corn control when tank mixed with Roundup PowerMAX[®] herbicide, XtendiMax[®] herbicide with VaporGrip[®] Technology, and Warrant[®] herbicide.

Research Site Details

Location	Soil Type	Previous Crop	Tillage Type	Planting Date	Seeding Rate (seeds/acre)	Spray Volume (GPA)
Nebraska	Silty loam	Corn	Conventional	5/13/19	160K	15
North Dakota	Silty clay loam	Corn	Conventional	5/21/19	130K	15
Illinois	Silty clay loam	Corn	Conventional	5/18/19	140K	15
Iowa	Silty clay loam	Corn	Conventional	5/16/19	160K	20

- This trial was performed in Nebraska, North Dakota, Illinois, and Iowa.
- In North Dakota and Iowa, corn seed was spread evenly over the trial area and shallowly cultivated prior to planting soybeans. In Nebraska, corn seed was spread evenly over the trial area prior to planting soybeans. In Illinois, soybeans were planted, then corn seed was planted in between soybean rows at a seeding rate of 10,000 seeds/acre.
- Plots were 4 rows wide, 30 feet long, and treatments were replicated 3 times.
- Herbicide treatments (Table 1) were applied with a backpack sprayer using Turbo TeeJet[®] Induction nozzles when volunteer corn plants were approximately 12 inches in height.
- The adjuvants used in this trial were MSO Ultra[™] (MSO), Superb[®] HC (HSCOC), and Destiny[®] HC (HSMSOC).
- Plots were visually evaluated 7 days after treatment for soybean crop injury and 21 days after treatment for volunteer corn control.
- There was not a significant effect of location on volunteer corn control, so data were combined across all locations for analysis.

Table 1. Herbicide treatments, use rates, adjuvant used, and adjuvant use rate.

Treatment Number	Treatment	Herbicide Use Rate per Acre	Adjuvant Type	Adjuvant Use Rate per Acre
1	Select Max [®] herbicide Roundup PowerMAX [®] herbicide	6 fl oz 32 fl oz	None	N/A
2*	Select Max herbicide Roundup PowerMAX [®] herbicide XtendiMax [®] herbicide with VaporGrip [®] Technology Warrant [®] herbicide	6 fl oz 32 fl oz 22 fl oz 48 fl oz	None	N/A
3	Select Max herbicide Roundup PowerMAX herbicide	6 fl oz 32 fl oz	MSO	1% v/v
4*	Select Max herbicide Roundup PowerMAX herbicide XtendiMax with VaporGrip Technology Warrant herbicide	6 fl oz 32 fl oz 22 fl oz 48 fl oz	MSO	1% v/v



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Table 1. Herbicide treatments, use rates, adjuvant used, and adjuvant use rate. (Continued)

Treatment Number	Treatment	Herbicide Use Rate per Acre	Adjuvant Type	Adjuvant Use Rate per Acre
5	Select Max herbicide Roundup PowerMAX herbicide	6 fl oz 32 fl oz	HSCOC	0.5% v/v
6*	Select Max herbicide Roundup PowerMAX herbicide XtendiMax with VaporGrip Technology Warrant herbicide	6 fl oz 32 fl oz 22 fl oz 48 fl oz	HSCOC	0.5% v/v
7	Select Max herbicide Roundup PowerMAX herbicide	6 fl oz 32 fl oz	HSMSOC	0.5% v/v
8*	Select Max herbicide Roundup PowerMAX herbicide XtendiMax with VaporGrip Technology Warrant herbicide	6 fl oz 32 fl oz 22 fl oz 48 fl oz	HSMSOC	0.5% v/v
9	Select Max herbicide Roundup PowerMAX herbicide	9 fl oz 32 fl oz	None	N/A
10*	Select Max herbicide Roundup PowerMAX herbicide XtendiMax with VaporGrip Technology Warrant herbicide	9 fl oz 32 fl oz 22 fl oz 48 fl oz	None	N/A
11	Select Max herbicide Roundup PowerMAX herbicide	9 fl oz 32 fl oz	MSO	1 % v/v
12*	Select Max herbicide Roundup PowerMAX herbicide XtendiMax with VaporGrip Technology Warrant herbicide	9 fl oz 32 fl oz 22 fl oz 48 fl oz	MSO	1% v/v
13	Select Max herbicide Roundup PowerMAX herbicide	9 fl oz 32 fl oz	HSCOC	0.5% v/v
14*	Select Max herbicide Roundup PowerMAX herbicide XtendiMax with VaporGrip Technology Warrant herbicide	9 fl oz 32 fl oz 22 fl oz 48 fl oz	HSCOC	0.5% v/v
15	Select Max herbicide Roundup PowerMAX herbicide	9 fl oz 32 fl oz	HSMSOC	0.5% v/v
16*	Select Max herbicide Roundup PowerMAX herbicide XtendiMax with VaporGrip Technology Warrant herbicide	9 fl oz 32 fl oz 22 fl oz 48 fl oz	HSMSOC	0.5% v/v
17	Fusilade® herbicide Roundup PowerMAX herbicide XtendiMax with VaporGrip Technology Warrant herbicide	6 fl oz 32 fl oz 22 fl oz 48 fl oz	None	N/A

*All treatments that included XtendiMax with VaporGrip Technology + Roundup PowerMAX herbicide + Warrant herbicide contained Intact™ Drift Reducing Adjuvant (DRA) at 0.5% v/v.



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Understanding the Results

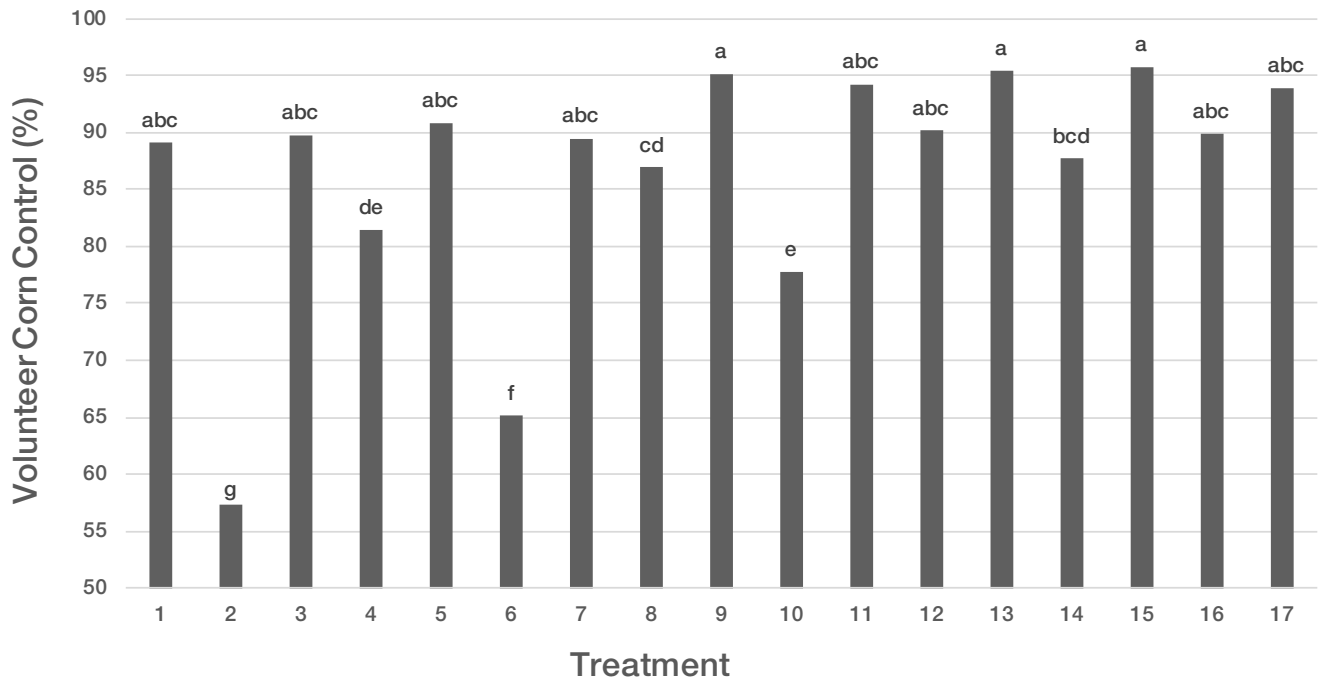


Figure 1. Volunteer corn control (%) 21 days after treatment.

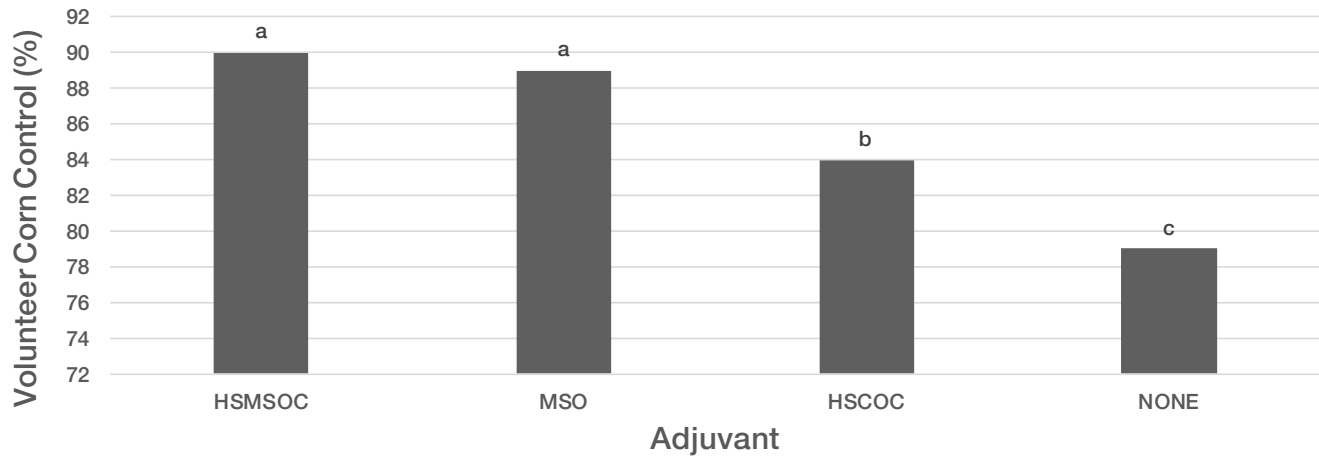


Figure 2. Influence of adjuvants on volunteer corn control (%) 21 days after treatment.



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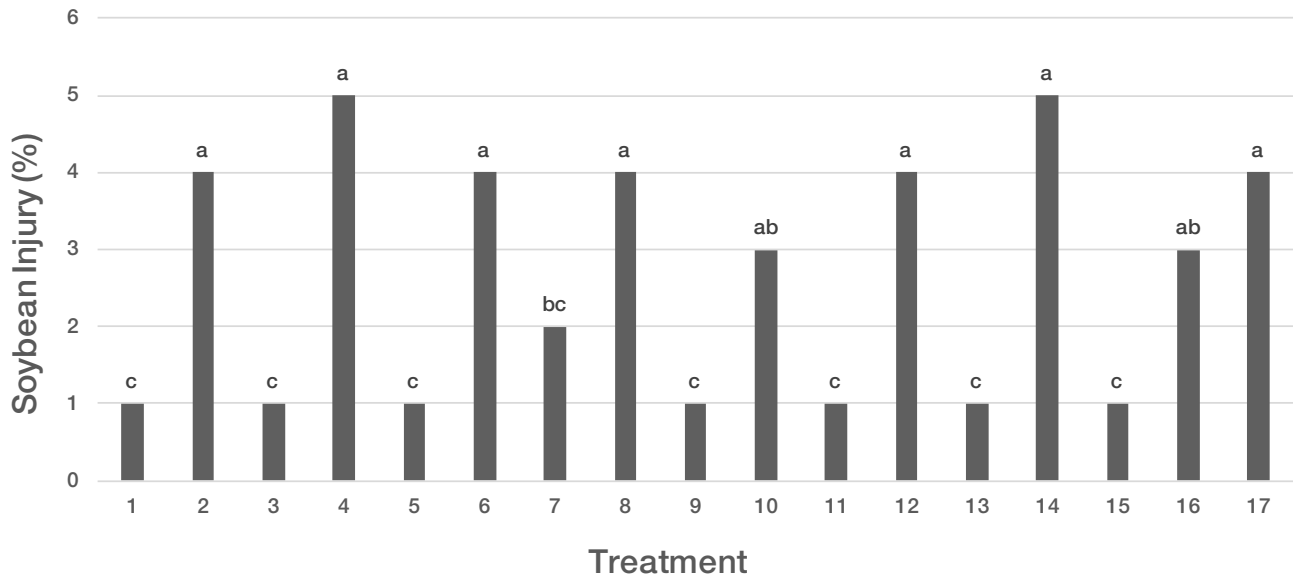


Figure 3. Soybean crop injury 7 days after treatment.



Figure 4. Nontreated plot 21 days after treatment in Nebraska.



Figure 5. Select Max® herbicide (6 fl oz) + Roundup PowerMAX® herbicide (Treatment 1) 21 days after treatment in Nebraska.



Figure 6. Select Max® herbicide (6 fl oz) + Roundup PowerMAX® herbicide + XtendiMax® herbicide with VaporGrip® Technology + Warrant® herbicide with Drift Reducing Adjuvant (DRA) (Treatment 2) 21 days after treatment in Nebraska.



Figure 7. Select Max® herbicide (6 fl oz) + Roundup PowerMAX® herbicide + XtendiMax® herbicide with VaporGrip® Technology + Warrant® herbicide + HSMSOC with DRA (Treatment 8) 21 days after treatment in Nebraska.



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Figure 4. Nontreated plot 21 days after treatment in Nebraska.



Figure 8. Select Max[®] herbicide (9 fl oz) + Roundup PowerMAX[®] herbicide (Treatment 9) 21 days after treatment in Nebraska.



Figure 5. Select Max[®] herbicide (6 fl oz) + Roundup PowerMAX[®] herbicide (Treatment 1) 21 days after treatment in Nebraska.



Figure 9. Select Max[®] herbicide (9 fl oz) + Roundup PowerMAX[®] herbicide + XtendiMax[®] herbicide with VaporGrip[®] Technology + Warrant[®] herbicide + HSMSOC with DRA (Treatment 16) 21 days after treatment in Nebraska.



Figure 6. Select Max[®] herbicide (6 fl oz) + Roundup PowerMAX[®] herbicide + XtendiMax[®] herbicide with VaporGrip[®] Technology + Warrant[®] herbicide with Drift Reducing Adjuvant (DRA) (Treatment 2) 21 days after treatment in Nebraska.



Figure 10. Fusilade[®] herbicide (6 fl oz) + Roundup PowerMAX[®] herbicide + XtendiMax[®] herbicide with VaporGrip[®] Technology + Warrant[®] herbicide with DRA (Treatment 17) 21 days after treatment in Nebraska.



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Figure 8. Select Max[®] herbicide (9 fl oz) + Roundup PowerMAX[®] herbicide (Treatment 9) 21 days after treatment in Nebraska.



Figure 9. Select Max[®] herbicide (9 fl oz) + Roundup PowerMAX[®] herbicide + XtendiMax[®] herbicide with VaporGrip[®] Technology + Warrant[®] herbicide + HSMSOC with DRA (Treatment 16) 21 days after treatment in Nebraska.



Figure 10. Fusilade[®] herbicide (6 fl oz) + Roundup PowerMAX[®] herbicide + XtendiMax[®] herbicide with VaporGrip[®] Technology + Warrant[®] herbicide with DRA (Treatment 17) 21 days after treatment in Nebraska.

- For treatments including Select Max[®] herbicide without an adjuvant, volunteer corn control was significantly reduced when Select Max herbicide was tank mixed with Roundup PowerMAX[®] herbicide + XtendiMax[®] herbicide with VaporGrip[®] Technology + Warrant[®] herbicide with DRA (Treatment 2 and Treatment 10) compared to Select Max herbicide + Roundup PowerMAX herbicide (Treatment 1 and Treatment 9).
- At the 6 fl oz rate of Select Max, the addition of HSMSOC to Roundup PowerMAX herbicide + XtendiMax with VaporGrip Technology + Warrant herbicide with DRA (Treatment 8) increased volunteer corn control to statistically similar levels to that of Treatment 1.
- Increasing the rate of Select Max herbicide to 9 fl oz and including either MSO (Treatment 12) or HSMSOC (Treatment 16) with Roundup PowerMAX herbicide + XtendiMax with VaporGrip Technology + Warrant herbicide with DRA increased volunteer corn control to levels statistically similar to those of Treatment 1 and Treatment 9.
- Volunteer corn control with Fusilade[®] herbicide (Treatment 17) was similar to treatments with Select Max herbicide that did not contain XtendiMax with VaporGrip Technology + Warrant herbicide (Treatment 1 and Treatment 9).



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- Averaged across all treatments, the addition of MSO or HSMSOC resulted in increased volunteer corn control compared to HSCOC or no adjuvant (Figure 2).
- When Roundup PowerMAX herbicide + XtendiMax with VaporGrip Technology + Warrant herbicide with DRA were in the tank, soybean injury was significantly greater compared to Roundup PowerMAX herbicide + Select Max herbicide (Figure 3).

Key Learnings

- For this trial, overall, increasing the rate of Select Max herbicide increased volunteer corn control.
- The addition of MSO or HSMSOC to tank mixes of Select Max herbicide + Roundup PowerMAX herbicide + XtendiMax with VaporGrip Technology + Warrant herbicide with DRA increased volunteer corn control.
- These results suggest that to help overcome reduced volunteer corn control when Select Max herbicide is tank mixed with Roundup PowerMAX herbicide + XtendiMax with VaporGrip Technology + Warrant herbicide with DRA, increase the rate of Select Max herbicide and use an MSO or HSMSOC adjuvant, or use Fusilade herbicide.
- These results may not replicate a field scenario where ears are dropped.

Legal Statements

The information discussed in this report is from a multiple site, 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.

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.

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.

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