

# Evaluation of Herbicide Programs Using Roundup Ready Soybeans

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## Objective

The adoption of Roundup Ready (RR) soybeans has been rapid. It is reported that 60 percent of the soybeans planted in the United States are RR. There are numerous herbicides that can be used with Roundup to extend the window of application, provide residual control, or improve control of certain weed species. This plot was designed to evaluate several different herbicide combinations with and without Roundup in comparison to a Roundup only program.

## Background

Cooperator:	Tom Weiler	Fertilizer:	None
County:	Morrow	Herbicides:	See Table
Soil Type:	Sloan silty clay loam	Variety:	Pioneer 93B01 RR
Drainage:	Systematic tile	Planting Date:	May 8, 2000
Previous Crop:	Corn	Planting Rate:	210,000 seeds/A
Tillage:	Conventional	Row Width:	10 inches
Soil Test:	pH 7.0, P 23 ppm, K 154 ppm	Harvest Date:	October 12, 2000

## Methods

The field chosen has moderate to high giant ragweed pressure, moderate giant foxtail pressure, and low to moderate common lambsquarters pressure. Eleven different herbicide treatments and an untreated check were replicated four times in a randomized complete block design. Plot size was 10 feet wide by 40 feet in length. The preemergence herbicides were applied on May 8, 2000; the postemergence herbicides were applied on June 6, 2000; and a second postemergence application of Roundup for one treatment was applied on July 18, 2000. Weed control was visually evaluated on August 17, 2000.

## Results

Herbicide Treatment <sup>a,b</sup>	Rate <sup>b</sup>	Treatment Timing <sup>b,c</sup>	Weed Control <sup>d</sup>			Herbicide Cost <sup>e</sup> (%)	Total Cost <sup>f</sup> (\$/A)
			Annual Grass (%)	Common Lambsquarters (%)	Giant Ragweed (%)		
Canopy	3.0 oz/A	PRE				6.75	
Roundup Ultra	1.5 pt/A	POST	99 a	99 a	94 ab	6.75	31.99
AMS	17#/100 gal	POST				0.61	

Domain	12.0 oz/A	PRE				8.44	
Roundup Ultra	1.5 pt/A	POST	99 a	95 ab	89 ab	6.75	33.68
AMS	17#/100 gal	POST				0.61	
Boundary	1.25 pt/A	PRE				11.88	
Roundup Ultra	1.5 pt/A	POST	94 b	78 b	86 abc	6.75	37.12
AMS	17#/100 gal	POST				0.61	
Roundup UltraDry	1.2 #/A	POST				11.43	
AMS	17#/100 gal	POST	97 ab	55 c	90 ab	0.61	25.92
Roundup Ultra	1.5 pt/A	POST				6.75	
AMS	17#/100 gal	POST				0.61	
Roundup Ultra	1.0 qt/A	POST2	100 a	100 a	99 a	9	34.85
AMS	17#/100 gal	POST2				0.61	
Extreme	3.0 pt/A	POST				11.58	
NIS	0.125 %v/v	POST	99 a	87 a	91 ab	0.19	26.37
AMS	2.5 #/A					0.45	
FirstRate	0.3 oz/A	POST				6.36	
Roundup Ultra	1.5 pt/A	POST	100 a	91 ab	95 ab	6.75	27.6
AMS	17#/100 gal	POST				0.61	
Cobra	8.0 oz/A	POST				7.59	
Roundup Ultra	1.0 qt/A	POST	99 a	94 ab	92 ab	9	31.08
AMS	17#/100 gal	POST				0.61	
Canopy	3.0 oz/A	PRE				6.75	
Dual II Magnum	1.67 pt/A	PRE				17.32	
FirstRate	0.3 oz/A	POST	96 ab	100 a	65 cd	6.36	41.68
MSO	1.2 %v/v	POST				2.88	
UAN	2.5 %v/v	POST				0.37	
Canopy	3.0 oz/A	PRE				6.75	
Flexstar	1.3 pt/A	POST				13	
Select	8.0 fl. oz/A	POST	100 a	94 ab	74 bcd	10.62	41.14
MSO	1.0 %v/v	POST				2.4	
UAN	2.5 %v/v	POST				0.37	
Authority	3.0 oz/A	PRE				7.05	
FirstRate	0.3 oz/A	POST				6.36	
Select	5.0 fl. oz/A	POST	99 a	74 bc	61 d	6.64	31.3
MSO	1.2 %v/v	POST				2.88	
UAN	2.5 %v/v	POST				0.37	
LSD (0.05)			4.6	21.4	22.2		

<sup>a</sup>All treatments applied at 20 gallons per acre and 30 psi.

<sup>b</sup>Abbreviations: AMS = ammonium sulfate, NIS = nonionic surfactant, MSO = methylated seed oil, UAN = urea ammonium nitrate (28% N), oz = ounce, pt = pint, A = acre, # = pound, gal = gallon, qt = quart, % v/v = percent volume to volume, fl. oz = fluid ounces.

<sup>c</sup>The PRE treatments were applied on May 8, 2000, and a total of 4.6 inches of rainfall was measured between May 8 to May 31. The POST treatments were applied on June 6, 2000, when the annual grasses were two- to four-inches tall, giant ragweed was 12- to 18-inches tall, and soybeans were at the V-3 stage of growth. The POST2 treatment was applied on July 18, 2000.

<sup>d</sup>Treatments means followed by the same letter are not significantly different, and visual evaluation of weed control was done on August 17, 2000.

<sup>e</sup>All herbicide and adjuvant costs listed in the table were the 2000 in-season retail prices.

<sup>f</sup>The total cost includes an application cost of \$4.00 per application, and a Roundup Ready Technology Fee of \$9.88 per acre if Roundup was applied postemergence.

## Summary and Notes

Only Roundup Ultra followed by Roundup Ultra and Canopy followed by Roundup Ultra provided greater than 93% control of all three species. All treatments provided excellent giant foxtail control. Most treatments provided good to excellent control of common lambsquarters, except Boundary followed by Roundup Ultra, Roundup UltraDry, and Authority followed by FirstRate plus Select, all of which provided significantly lower control. Most treatments provided good to excellent control of giant ragweed, except Canopy plus Dual II Magnum followed by FirstRate, Canopy followed by Flexstar plus Select, and Authority followed by FirstRate plus Select. The poorer control with the two treatments containing FirstRate may be due to the presence of ALS-resistant giant ragweed. The poorer control with the treatment containing Flexstar was caused by too large of giant ragweed at the time of application. The slightly lower control of giant ragweed for the treatments containing Domain and Boundary may be a result of too large of plants at the time of the postemergence application, since these two products are ineffective in controlling giant ragweed.

The benefit of the preemergence herbicides before Roundup is that the early season weed control helps to reduce weed competition and widen the window for the postemergence application. The benefit of tank-mixing residual herbicides with Roundup is to be able to make applications to small weeds and still provide later season weed control and provide improved control for certain weed species. The total cost per acre ranged from \$25.92 to \$41.68 per acre. The two-pass Roundup Ultra treatment cost \$34.85 per acre.

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