

Soybean Herbicide Management with Preemergence and Postemergence applications of Zidua at Rosemount, MN - 2011. Gunsolus, Jeffrey L. and Douglas W. Miller. The objective of this experiment was to evaluate crop safety and weed control with Zidua and several other herbicides applied preemergence and/or postemergence in a Roundup Ready weed control system. The experiment was conducted at Rosemount, MN on a Waukegon silt loam soil. Following corn, the experimental area was fall plowed. In the spring, the field was field cultivated on April 15 and April 25. Pioneer 91Y92 soybeans were planted on May 27 with 30 inch row spacing. The experimental design was a randomized complete block with four replications and plot size was 15 by 25 ft. All herbicide treatments were applied to a center 10 ft strip with a CO₂ powered backpack sprayer utilizing a six nozzle boom with 20 inch nozzle spacing, 11002VS XR Teejet flat-fan nozzles, 30 psi pressure, and a spray volume of 20 gpa. Application dates, environmental conditions, and weed data are presented below. Weed control ratings are presented in the table.

Treatment Date	May 27	June 16	July 13
Application	preemergence	early post	post sequential to preemergence
Application Time	1:00 - 1:20pm	3:00 - 3:30pm	3:10 - 3:00pm
Actual Soybean Stage	--	VC-V1	(not recorded)
Air Temperature (°F)	63	74	76
Relative humidity (%)	45	59	44
Dewpoint (°F)	41	59	53
Soil Moisture	dry	moist	moist at 0.25"
Soil Temperature (°F)	56	72	81
Sky	cloudy	40 % clouds	75 % clouds
Wind (mph)	SE 5-12	W 5	E 8
Rainfall before Application			
Week 1 (inch)	2.18	1.93	1.46
Rainfall after Application			
Week 1 (inch)	0.97	2.46	2.74
Week 2 (inch)	0.12	0.02	0.57
Weed Stages			
Common Lambsquarters - Colq	--	0.5-5" / 2-9 lf	3-15"
Common Ragweed - Corw	--	0.5-2.5" / 2-10 lf	2-15"
Pigweed species	--	0.5-1.5" / 2-3 lf	2-8"
Wild Mustard - WimU	--	0.5" / 2 lf	2-6"
Grass species	--	(not recorded)	(not recorded)

Weed Density (plants/ft²)	June 16	July 26	
		Roundup applied EPOST on June 16	Untreated Check
Common Lambsquarters - Colq	1.0	3.0	3.9
Common Ragweed - Corw	0.8	0.7	1.3
Eastern Black Nightshade - Ebns	0.0	1.2	0.5
Pigweed species	0.2	2.2	1.5
- primarily Powell amaranth			
Wild Mustard - WimU	scattered	0.5	0.1
Grass species	0.2 (mixed species)	--	--
- Barnyardgrass	--	1.0	0.4
- Giant Foxtail	--	0.3	0.1
- Large & Smooth Crabgrass	--	0.4	0.4
- Woolly Cupgrass	--	0.5	0.3
- Yellow Foxtail	--	scattered	scattered

Heavy rainfall occurred on May 28 followed by a hot, dry period that resulted in severe soil crusting and poor soybean and weed emergence. The experimental area was rotary hoed at a speed of 1.2 mph on June 13 to break up the soil surface, but that did not result in a significant increase in soybean emergence. Soybean plants that emerged were chlorotic and had shredded leaves, therefore any possible preemergence herbicide injury symptoms could not be discerned. No injury symptoms were observed following the early postemergence treatment applications.

Weed populations were recorded prior to the early postemergence treatment applications on June 16 and again on July 26. At the June 16 date, common lambsquarters and common ragweed populations were the most consistent of the weeds present. Initial pigweed and grass species populations were generally light and variable throughout the experimental area. Wild mustard populations were high prior to spring tillage, but light and variable after planting. A second flush of weed growth occurred in late June to early July. This was noted in the weed count data on July 26 and also in the range of weed heights recorded at the postemergence sequential application on July 13. The second flush included eastern black nightshade and velvetleaf, but velvetleaf populations were too variable to rate. The July 13 sequential Roundup application was applied later than would normally be recommended. As a result, larger lambsquarters and ragweed were not totally controlled. Due to the poor soybean stand, no consistent canopy was formed and little competition from the soybeans resulted. This probably influenced later season weed germination and certainly contributed to the lower weed control ratings at the later dates.

Preemergence Treatment Weed Control

Zidua + Sharpen and Zidua + Verdict resulted in good to excellent control of common lambsquarters and common ragweed. Control of these two weeds was slightly lower with Zidua + Valor SX. All treatments showed good to excellent control of nightshade, pigweeds, wild mustard, and grass species. Although no statistically significant differences were noted, the lower rate of Zidua + Verdict did show some lower control of wild mustard compared to the other treatments. The sequential roundup application controlled most of the weeds present at the July 13 application date. As noted above, some larger lambsquarters and ragweed were not totally killed (particularly common ragweed). There were also a few late germinating weeds present and this is represented in the late ratings.

Early Postemergence Treatment Weed Control

With the exception of the Warrant + Roundup treatment, all treatments controlled the weeds present at the June 16 application date. Subsequent ratings represent emergence of new weeds (except for the Warrant + Roundup treatment) The Roundup only treatment was used as a check at the July 13 and August 24 rating dates. Common lambsquarters and common ragweed control dropped significantly by the August 24 rating for the Zidua + Roundup and Anthem + Roundup treatments. Common ragweed control with Zidua + Extreme dropped slightly during that period. All but the Warrant + Roundup treatment maintained good to excellent control of nightshade, pigweed, mustard, and grass species throughout the rating period. The Warrant + Roundup treatment showed some antagonism as common lambsquarters and common ragweed were not fully controlled by the initial application (July 1 rating). In addition, Warrant provided poor residual control of all weed species.

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Table. Weed control ratings

Herbicide Treatment ¹	Rate (product/A)	Weed Control														
		Colq			Corw			Ebns		pigweed species			Wimu			grass species
		7/1	7/13	8/24	7/1	7/13	8/24	7/13	8/24	7/1	7/13	8/24	7/1	7/13	8/24	8/24
------(%)-----																
<u>(Preemergence May 27) and (Postemergence July 13)</u>																
(Zidua ² + Sharpen ³) + (Roundup ⁴ + AMS ⁵)	(2 oz + 1 oz) + (22 oz + 8 pt)	95	94	91	92	89	91	99	98	100	100	85	95	94	96	97
(Zidua + Sharpen) + (Roundup + AMS)	(2.5 oz + 1 oz) + (22 oz + 8 pt)	91	91	93	94	94	97	100	99	99	99	97	97	98	97	98
(Zidua + Valor SX ⁶) + (Roundup + AMS)	(1.5 oz + 2 oz) + (22 oz + 8 pt)	86	83	94	75	73	93	100	100	99	98	98	100	98	99	98
(Zidua + Verdict ⁷) + (Roundup + AMS)	(1.5 oz + 5 oz) + (22 oz + 8 pt)	95	95	93	95	94	94	100	98	100	99	94	84	83	86	98
(Zidua + Verdict) + (Roundup + AMS)	(2 oz + 5 oz) + (22 oz + 8 pt)	95	93	93	96	95	94	100	99	100	100	95	95	88	97	99
LSD (P=.05)		5	6	ns	13	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
<u>Early Postemergence June 16</u>																
Roundup + AMS	22 oz + 8 pt	100	--	--	100	--	--	--	--	100	--	--	100	--	--	--
Zidua + Exterme ⁸ + AMS	2 oz + 48 oz + 8 pt	100	100	98	100	99	81	100	100	100	100	100	100	100	100	94
Zidua + Roundup + AMS	2 oz + 22 oz + 8 pt	100	98	44	98	95	24	99	87	100	100	99	100	98	97	94
Warrant ⁹ + Roundup + AMS	3 pt + 22 oz + 8 pt	90	28	18	50	11	8	9	28	100	24	10	39	9	11	58
Prefix ¹⁰ + Roundup + AMS	2 pt + 22 oz + 8 pt	100	100	89	100	100	99	100	100	100	100	100	100	100	100	98
Anthem ¹¹ + Roundup + AMS	8 oz + 22 oz + 8 pt	100	98	65	97	96	26	100	97	100	100	100	100	98	91	97
LSD (P=.05)		5	24	29	5	4	15	3	29	ns	21	6	23	5	6	23

¹ Treatments and rates in parenthesis represent a single application.

² Zidua 85WG = pyroxasulfone.

³ Sharpen 2.85 SC = saflufenacil.

⁴ Roundup PowerMax 4.5L = glyphosate.

⁵ AMS = N-Pak ammonium sulfate solution (3.4 lbs/gal).

⁶ Valor SX 51WDG = flumioxazin.

⁷ Verdict 5.57EC = 0.57 lbs ai/gal saflufenacil & 5.0 lbs ai/gal dimethenamid-P.

⁸ Extreme 2.17L = 0.17 lb ae/gal imazethapyr & 2 lb ai/gal glyphosate salt.

⁹ Warrant 3CS = acetochlor.

¹⁰ Prefix 5.29EC = 4.34 lbs ai/gal s-metolachlor & 0.95 lbs ai/gal fomesafen.

¹¹ Anthem 2.15SE = fluthiacet-methyl & pyroxasulfone.