

Preemergence weed control with Fierce and Fierce MTZ in Liberty Link soybeans at Rosemount, MN - 2017.

Gunsolus, Jeffrey L, Douglas Miller, Brad Kinkaid, Hugo Oliveira, and Ryan Mentz. The objective of this experiment was to compare preemergence applications of Fierce and Fierce MTZ with Authority Elite, Zidua Pro and Boundary for weed control and soybean injury in a Liberty Link soybean system. The experiment was conducted at Rosemount, MN on a Waukegon silt loam soil with pH 6.3 and 4.6% organic matter. Soil test P and K were 38 and 222 lbs/A, respectively. Following oats, the experimental area was chisel plowed in fall 2016. On April 21, 2017, the area was field cultivated. The area was fertilized with 60 lbs/A P and 60 lbs/A K on April 25. The area was field cultivated a second and third time on May 30 and June 1, respectively. Northstar NS 1742LL soybeans were seeded in 30 inch rows at a rate of 150,000 seeds/A on June 1. The experimental design was a randomized complete block with four replications. Plot size was 10 by 30 feet. Preemergence and late postemergence herbicide treatments were applied with a tractor mounted, compressed air sprayer with an eight nozzle boom, 15 inch nozzle spacing, 110015VS XR Teejet flat-fan nozzles at 35 psi pressure producing a spray volume of 15 gpa. The June 19 postemergence application was applied with a backpack, CO2 powered sprayer with a six nozzle boom, 20 inch nozzle spacing, 110015VS XR Teejet flat-fan nozzles at 35 psi pressure producing a spray volume of 15 gpa. Preemergence treatments were applied following planting on June 1. A postemergence application of Liberty (glufosinate) at 29 oz/A + AMS at 3 qts/A was applied on June 29. This application was based on a target of 2 inch weeds in the Fierce (3 oz/A) treatment. A postemergence application of Liberty at 29 oz/A + Select Max (clethodim) at 6 oz/A + AMS at 3 qts/A was applied on July 14. This application was targeted 14 days after the first postemergence application whether it was needed or not. Two 0.25m² quadrants were established in each plot of the Fierce (3 oz/A) treatment and the no-preemergence check treatment to monitor weed densities. Weed densities were determined prior to each postemergence application and are presented in Table 2. Weed control and soybean injury were visually rated and results are presented in Table 1. Early October observations showed 100% weed control for all treatments (data not shown). Yields were not determined.

Treatment Date	June 1	June 29	July 14
Treatments Applied	Preemergence	Liberty + AMS Postemergence	Liberty + Select Max + AMS Late Postemergence
Air Temperature (°F)	75	70	66
Relative humidity (%)	24	68	58
Dewpoint (°F)	36	59	53
Soil Moisture	moist at 2"	moist	moist at 1.5"
Soil Temperature (°F)	67	69	73
Sky	5% clouds	100% clouds	100% clouds
Wind (mph)	S 2-4	NNW 6-8	NNW 0-3
Soybean Stage	--	2-3 trifoliate	7-8 trifoliate (R1)
Soybean Height (inch)	--	8-10	18-22
Rainfall before Application			
Week 2 (inch)	1.55	0.49	1.06
Week 1 (inch)	0.17	1.18	0.79
Rainfall after Application			
Week 1 (inch)	0.12	0.18	0.99
Week 2 (inch)	1.70	0.26	0.58

Results

Soybeans began emerging on June 7, six days after planting. Insignificant amounts of rain occurred on June 3 (0.07 inch) and June 7 (0.05 inch). The first major rain (1.15 inches) occurred on June 11 with an additional 0.55 inch on June 12-13. Common lambsquarters, common ragweed, and pigweed species (Powell amaranth and redroot pigweed) were the primary broadleaf species present. Populations of velvetleaf and wild mustard were also present but densities were low and were highly variable. Grass species consisted primarily of giant foxtail and yellow foxtail (approximately 3:1 ratio). Woolly cupgrass was also present at low densities and distribution was variable.

Soybean injury was observed on June 21 with the Fierce, Fierce MTZ, V-10425, and Valor EZ1 + V-10463 treatments showing moderate leaf deformation (drawstring effect).

Overall, Zidua Pro provided the best residual weed control over all weed species. Control of each species was 100% on July 13.

Fierce (3 oz/A and 3.75 oz/A), Fierce MTZ, and V-10425 showed similar control of each weed species. Common ragweed control was slightly lower with these treatments on June 29 compared to Zidua Pro. Residual grass control was also slightly less at the July 13 rating with these treatments compared to Zidua Pro.

Control of common lambsquarters, common ragweed, wild mustard, and grass species was significantly lower with the Valor EZ1 + V-10463 tank mix compared to Zidua Pro.

Control of common ragweed with Authority Elite and Boundary was poor and significantly lower than the other preemergence treatments. Velvetleaf control was also observed to be poor with Authority Elite and Boundary, however the difference was not statistically significant due to the variable population. Authority Elite showed poor wild mustard control compared to the other treatments. Grass control with Authority Elite was significantly less than with Zidua Pro.

Overall control of all species was very good at the July 13 rating date. Soybeans fully canopied around the first week of August. Based on these observations, all treatments that received a preemergence herbicide application would have performed well without the second postemergence application.

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Table 1. Soybean Injury and Weed Control

Preemergence Treatment ¹	Rate (product/A)	Weed Control																				
		Soybean Injury			Colq			Corw			pigweed spp.			Vele			Wimu			grass species		
		6/21	6/21	6/29	7/13	6/21	6/29	7/13	6/21	6/29	7/13	6/21	6/29	7/13	6/21	6/29	7/13	6/21	6/29	7/13		
		----- (%) -----																				
Fierce ²	3 oz	9	100	96	100	98	95	100	100	99	100	100	98	98	100	98	98	99	95	97	98	
Fierce	3.75 oz	11	100	99	100	99	97	99	100	100	100	100	99	99	100	100	98	100	99	98	98	
Fierce MTZ ³	1 pt	10	100	96	100	97	96	99	100	100	99	100	97	100	99	98	99	99	96	99	98	
Authority Elite ⁴	25 oz	3	100	100	100	66	71	97	100	98	100	85	87	100	66	74	98	93	93	99	99	
Zidua Pro ⁵	4.5 oz	1	99	99	100	99	99	100	100	100	100	100	99	100	100	100	100	99	99	100	99	
Boundary ⁶	2 pts	4	94	92	98	60	81	99	98	98	100	85	90	100	100	96	99	98	97	99	99	
V-10425 ⁷	12 oz	15	100	94	100	97	96	100	100	99	100	99	99	100	100	100	100	97	95	99	99	
Valor EZ1 ⁸ + V-10463 ⁹	2 oz + 23 oz	10	99	88	99	97	95	100	100	99	100	100	98	99	96	93	100	96	91	99	99	
No Preemergence	0	0	--	--	91	--	--	96	--	--	94	--	--	99	--	--	98	--	--	96	96	
LSD (0.05)		2.3	3.2	7.9	2.3	7.5	2.9	1.6	ns	ns	1.3	ns	ns	ns	16.4	6.5	ns	5.6	5.4	1.7	1.7	

¹ All treatments received postemergence applications of Liberty + AMS (29 oz + 3 qt) on June 29 and Liberty + Select Max + AMS (29 oz + 6 oz + 3 qt) on July 14.

² Fierce 76WDG = flumioxazin (33.5%) & pyroxasulfone (42.5%).

³ Fierce MTZ 2.64 SC = flumioxazin & pyroxasulfone & metribuzin .

⁴ Authority Elite 7SCF = sulfentrazone (0.7 lb ai/gal) & s-metolachlor (6.3 lb ai/gal).

⁵ Zidua Pro 4.09L = 2.28 lbs ai/gal pyroxasulfone & 0.48 lbs ai/gal saflufenacil & 1.33 lbs ai/gal imazethapyr .

⁶ Boundary 6.5L = S-metolachlor (5.25 lb ai/gal) & metribuzin (1.25 lb ai/gal).

⁷ V-10425 = experimental from Valent.

⁸ Valor EZ1 4SC = flumioxazin.

⁹ V-10463 = experimental from Valent.

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Table 2. Weed Density and Size

Preemergence Treatment		Weed Species					
		Colq	Corw	pigweed spp.	Vele	Wimu	grass species
<u>Fierce (3 oz/A)</u>							
June 29	Weed Density (#/m ²)	1	23	0	0	1	59
July 14	Weed Density (#/m ²)	0	0	0	0	0	12
<u>No Preemergence Treatment</u>							
June 29	Weed Density (#/m ²)	146	222	75	5	14	170
	Leaf number	4-6	2-6	4-6	2-4	2-5	3-6
	Average height (inch)	1.0	1.5	1.5	1.5	2.5	4.0
	Height range (inch)	0.5-5	0.5-5	0.25-7	1-4	1-4	0.5-10
July 14	Weed Density (#/m ²)	28	2	2	0	4	26
	Leaf number	4	4-6	2-8	--	2-3	3-6
	Height (inch)	0.75-1.0	0.75-2.5	0.5-2.0	--	0.5-2	1.25-3.0