

**Fierce, Cobra, and Resource 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 evaluate weed control and soybean injury with Fierce, Cobra, and Resource 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. 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. Preemergence treatments were applied following planting on June 1. Two postemergence applications targeted 21 days after planting (DAP) and 35 DAP. The second application applied 35 DAP consisted of Liberty at 29 oz/A + Select Max (clethodim) at 6 oz/A + AMS at 3 qts/A and was applied on July 11 to all treatments (except the untreated check) whether it was needed or not. Weed densities were determined from two 0.25m<sup>2</sup> quadrants per plot of selected treatments prior to each postemergence application and are presented in Table 2. Soybean injury and weed control were visually rated and results are presented in Table 1. Yields were not determined.

<b>Treatment Date</b>	<b>June 1</b>	<b>June 23</b>	<b>July 11</b>
Treatments Applied	Preemergence	21 DAP Postemergence	35 DAP Late Postemergence
Air Temperature (°F)	75	69	80
Relative humidity (%)	24	54	54
Dewpoint (°F)	36	52	62
Soil Moisture	moist at 2"	moist at 0.1"	moist at 1"
Soil Temperature (°F)	67	71	77
Sky	5% clouds	90% clouds	85% clouds
Wind (mph)	S 2-4	WNW 7-12	SE 3-7
Soybean Stage	--	2-3 trifoliate (most 2)	7-8 trifoliate (R1)
Soybean Height (inch)	--	6-8	varied by treatment
Rainfall before Application			
Week 2 (inch)	1.55	1.70	1.06
Week 1 (inch)	0.17	0.99	0.26
Rainfall after Application			
Week 1 (inch)	0.12	0.99	0.25
Week 2 (inch)	1.70	0.07	3.35

## **Results**

The preemergence Fierce treatment resulted in visible soybean leaf deformation (drawstring effect) at the earlier rating dates. The Cobra tank mix caused significant soybean necrosis and stunting. The stunting and lower leaf loss remained significant at the July rating dates. The Resource tank mix caused moderate leaf necrosis and bronzing and slight stunting. The Liberty + AMS treatment resulted in slight chlorosis. On July 11, soybean heights were approximately 15-18" (Fierce treatment and Liberty + AMS post only), 13-16" (Resource tank mix post), and 10-14" (Cobra Tank mix post).

Common lambsquarters, common ragweed, and pigweed species (Powell amaranth and redroot pigweed) were the primary broadleaf species present. Populations of eastern black nightshade, 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.

Fierce provided excellent control of common lambsquarters and pigweed species and good control of common ragweed and grass species. 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.

All postemergence applications effectively controlled emerged weeds. The Resource tank mix and Liberty + AMS treatment had similar weed control ratings on July 11. Moderate flushes of common lambsquarters and grasses were visibly noted with these treatments and were also reflected in the weed density quadrant counts (Table 2). Common ragweed and pigweed flushes were also visible noted with these two treatments to a lesser degree but were not apparent in the weed density data. Cobra provided some soil residual control of the broadleaf weed species compared to the Resource tank mix and Liberty alone treatment (July 11 rating). Cobra had no residual effect on grasses based on visual ratings, however grass density was less based on the quadrant counts.

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**Table 1. Soybean Injury and Weed Control**

Treatment <sup>1</sup>	Rate  (product/A)	Weed Control																												
		Soybean Injury					Colq						Corw						pigweed spp.					grass species						
		6/16	6/23	6/29	7/11	7/19	6/16	6/23	6/29	7/11	7/19	10/17	6/16	6/23	6/29	7/11	7/19	10/17	6/16	6/23	6/29	7/11	7/19	10/17	6/16	6/23	6/29	7/11	7/19	10/17
		----- (%) -----																												
<b>Preemergence (June 1) / Postemergence 21 DAP (June 23)</b>																														
Fierce <sup>2</sup> / Liberty <sup>3</sup> + AMS <sup>4</sup>	3 oz / 29 oz + 3 qts	10	5	7	0	0	100	100	99	99	100	100	98	94	99	99	100	100	100	100	100	100	100	100	98	97	99	97	100	100
<b>Postemergence 21 DAP (June 23)</b>																														
Resource <sup>5</sup> + Liberty + AMS + NIS	4 oz + 29 oz + 3 qts + 4.8 oz	--	--	19	6	11	--	--	99	78	99	99	--	--	99	94	100	100	--	--	99	93	100	100	--	--	98	90	99	100
Cobra <sup>6</sup> + Liberty + AMS + NIS	12.5 oz + 29 oz + 3 qts + 4.8 oz	--	--	70	35	28	--	--	99	95	99	99	--	--	100	99	99	100	--	--	100	99	100	100	--	--	99	90	99	100
Liberty + AMS	29 oz + 3 qts	--	--	4	0	0	--	--	98	75	99	100	--	--	98	89	99	100	--	--	99	94	100	100	--	--	98	90	99	100
Untreated Check	--	--	--	0	0	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LSD (0.05)		--	--	5.8	5.0	2.4	--	--	ns	13.7	ns	ns	--	--	0.6	5.8	ns	ns	--	--	ns	4.3	ns	ns	--	--	1.5	ns	ns	ns

<sup>1</sup> All treatments (except untreated check) received an additional postemergence applications of Liberty + Select Max + AMS (29 oz + 9 oz + 3 qt) on July 11 (35 DAP).

<sup>2</sup> Fierce 76WDG = flumioxazin (33.5%) & pyroxasulfone (42.5%).

<sup>3</sup> Liberty 2.34L = glufosinate-ammonium.

<sup>4</sup> AMS = N-Pak ammonium sulfate solution (3.4 lbs/gal).

<sup>5</sup> Resource 0.86 SL = flumiclorac pentyl ester .

<sup>6</sup> Cobra 2SL = lactofen.

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**Table 2. Weed Density and Size**

Treatment		Weed Species			
		Colq	Corw	pigweed spp.	grass species
<b>June 23 Prior to Postemergence 21 DAP</b>					
Untreated Check	Weed Density (#/m <sup>2</sup> )	59	200	181	441
	Leaf number	cot - 4	cot - 6	cot - 3	1 - 4
	Height (inch)	0.5 - 2	0.5 - 3	0.25 - 1	0.25 - 3
Fierce / Liberty + AMS	Weed Density (#/m <sup>2</sup> )	3	32	0	30
<b>July 11 Prior to Postemergence 35 DAP</b>					
Fierce / Liberty + AMS	Weed Density (#/m <sup>2</sup> )	1	1	0	4
	Leaf number	cot - 6	2 - 6	--	1 - 5
	Height (inch)	0.25 - 1.25	0.5 - 1	--	0.25 - 3
Resource + Liberty + AMS + NIS	Weed Density (#/m <sup>2</sup> )	43	1	1	52
	Leaf number	2 - 8	4 - 6	2 - 8	1 - 5
	Height (inch)	0.5 - 2.5	0.5 - 2	1 - 3	0.25 - 3
Cobra + Liberty + AMS + NIS	Weed Density (#/m <sup>2</sup> )	9	2	1	21
	Leaf number	2 - 6	2 - 4	2	1 - 4
	Height (inch)	0.25 - 2	0.25 - 1	0.5 - 0.75	0.25 - 5
Liberty + AMS	Weed Density (#/m <sup>2</sup> )	66	4	1	46
	Leaf number	2 - 6	2 - 6	2 - 10	1 - 5
	Height (inch)	0.5 - 2	0.75 - 2	0.5 - 3	0.75 - 4