Weed control with Panther Pro in Liberty Link soybeans at Rosemount, MN - 2018. Gunsolus, Jeffrey L., Douglas W. Miller, Bradley Kinkaid, Ryan Mentz, and Aryane Batista. The objective of this experiment was to evaluate weed control and soybean injury with preemergence applications of Panther Pro in a Liberty Link soybean system. The experiment was conducted at Rosemount, MN on a Waukegon silt loam (5% sand, 50% silt, 45% clay) with pH 5.4 and 4.3% organic matter. Soil test P and K were 46 and 436 lbs/A, respectively. The previous crop was corn and the area was chisel plowed in the fall of 2017. The area was tilled with a soil finisher on April 30, 2018. On May 3, the area was fertilized with 60 lbs/A P and 60 lbs/A K. The area was field cultivated on May 4 and on May 21. On May 22, NorthStar NS 1742LL Liberty Link soybeans were seeded in 30 inch rows at a rate of 150,000 seeds/A. The experimental design was a randomized complete block with four replications. Plot size was 15 by 30 feet. Treatments were applied to a 10 foot wide strip with a tractor mounted, compressed air sprayer with an eight nozzle boom and 15 inch nozzle spacing. Applications were made using 110015VS XR Teejet flat-fan nozzles at 35 psi pressure producing a spray volume of 15 gpa. Preemergence treatments were applied following planting on May 22. Sequential postemergence applications were applied on June 13 and June 28. Weed control and soybean injury were visually rated. Yields were not determined. Data are presented in the table below.

Treatment Date	**May 22**	**June 13**	**June 28**
Treatments Applied	Preemergence	Early Postemergence	Late Postemergence
Application Target	--	2-4" weeds	2-4" weeds
Air Temperature (°F)	73	80	84
Relative humidity (%)	59	24	58
Dewpoint (°F)	58	41	68
Soil Moisture	moist at 1.75"	moist at 1.5"	moist at 0.25"
Soil Temperature (°F)	73	84	86
Sky	85% clouds	10% clouds	60% clouds
Wind (mph)	SE 0-5	W 5-8	SE 3-6
Soybean Stage	--	1-2 trifoliate	5 trifoliate
Soybean Height (inch)	--	6-8	12-13"
Rainfall before Application			
Week 1 (inch)	0.08	0.64	0.57
Rainfall after Application			
Week 1 (inch)	0.76	4.67	1.55
Week 2 (inch)	1.71	0.57	0.05
Weed height in 2-pass postemergence check (inches)			
Amaranth species*	--	0.5-4	0.25-5
Common Lambsquarters (Colq)	--	1-3	2.5-4
Common Ragweed (Corw)	--	1-4	2-4
Eastern Black Nightshade (Ebns)	--	0.25-1	0.25-1
Velvetleaf (Vele)	--	1-4	none present
Grass species**	--	1-5	2-5
Weed densities in 2-pass postemergence check (#/m^2)			
Amaranth species	--	428	11
Common Lambsquarters (Colq)	--	73	5
Common Ragweed (Corw)	--	3	1
Eastern Black Nightshade (Ebns)	--	16	1
Velvetleaf (Vele)	--	17	0
Grass species	--	30	6

* 90-95% tall waterhemp and 5-10% Powell amaranth

** Woolly cupgrass and giant & yellow foxtail

Results

Panther Pro caused some slight injury symptoms at the June 13 rating but symptoms were not apparent at the later rating dates.

Tall waterhemp and common lambsquarters were the dominant broadleaf weeds species and were distributed evenly throughout the experimental area. Eastern black nightshade and velvetleaf were also present with nightshade evenly distributed. Velvetleaf population density varied greatly throughout the area. Common ragweed populations were light and variable. Grass species were predominantly woolly cupgrass with scattered giant and yellow foxtail.

The two-pass Cheetah postemergence was included as a check for later emerging weeds. The weed sizes and densities in the application data table above represent this treatment.

Shaded ratings data in the Table represent preemergence weed control prior to the postemergence sequential applications. Authority Assist provided excellent preemergence control of common lambsquarters and eastern black nightshade and good control of amaranth species. Control of common ragweed, velvetleaf, and grass species was poor to fair. The postemergence sequential Cheetah application was required on June 13 for this treatment. Weed size at this sequential application was 0.5-2.5” amaranths, 1-2” lambsquarters, 1-4” common ragweed, 1-2.5” velvetleaf, and 1-5” grasses. Late emerging amaranth, common ragweed, and grass species were present at the later rating dates in this treatment.

Broadleaf weed control was general excellent with Panther Pro for all species. The 12 oz rate was slightly less active on common ragweed compared to the 15 oz rate. Grass control was good with Panther Pro with some escapes present at both rates. The postemergence sequential Cheetah application was applied on June 28. Weed sizes at this sequential application were 2-6” common ragweed, 3” velvetleaf and 4-10” woolly cupgrass. The postemergence application resulted in excellent season long weed control for all weed species with Panther Pro.

Weed control with Panther Pro in Liberty Link soybeans at Rosemount, MN - 2018 (Gunsolus, Miller, Kinkaid, Mentz, and Batista).

		Soybean	Weed Control																													
		Injury	amaranth species[1]					Colq					Corw					Ebns					Vele					Grass species[2]				
Treatment[3]	Rate[3]	6/13	6/13	6/22	6/28	7/18	L0/12	6/13	6/22	6/28	7/18	L0/12	6/13	6/22	6/28	7/18	L0/12	6/13	6/22	6/28	7/18	L0/12	6/13	6/22	6/28	7/18	L0/12	6/13	6/22	6/28	7/18	L0/12
	(product/A)	(%)																														
(Preemergence May 22) / (Early Postemergence June 13)																																
(Authority Assist[4]) / (Cheetah[5] + AMS[6])	(8 oz) / (29 oz + 3 qt)	2	89	99	99	97	93	97	100	100	99	100	43	100	97	95	98	100	100	100	100	99	64	100	100	100	100	70	100	99	97	96
(Preemergence May 22) / (Late Postemergence June 28)																																
(Panther Pro[7]) / (Cheetah + AMS)	(12 oz) / (29 oz + 3 qt)	8	100	100	100	100	100	100	100	100	100	100	98	94	96	99	100	100	100	100	100	100	100	99	99	100	100	94	91	88	99	99
(Panther Pro) / (Cheetah + AMS)	(15 oz) / (29 oz + 3 qt)	10	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	98	96	93	99	100
(Early Postemergence June 13) / (Late Postemergence June 28)																																
(Cheetah + AMS) / (Cheetah + AMS)	(29 oz + 3 qt) / (29 oz + 3 qt)	--	--	91	96	98	99	--	97	95	99	98	--	100	100	99	100	--	99	99	100	100	--	100	99	100	100	--	99	98	99	100
LSD (0.05)		1.4	9	ns	ns	2	2	ns	2	1	1	ns	32	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	17	7	7	2	2.4

[1] 90-95% tall waterhemp and 5-10% Powell amaranth.

[2] Woolly cupgrass and giant & yellow foxtail.

[3] Treatments and rates in parenthesis represent a separate application timing.

[4] Authority Assist 4L = 3.3 lbs ai/gal sulfentrazone & 0.67 lbs ai/gal imazethapyr .

[5] Cheetah 2.34L = glufosinate-ammonium.

[6] AMS = N-Pak ammonium sulfate solution (3.4 lbs/gal).

[7] Panther Pro 4.2L = 0.67 lbs ai/gal flumioxazin & 0.53 lbs ai/gal imazethapyr & 3.0 lb ai/A metribuzin.