Residual weed control comparisons with BalanceBean and other herbicide programs at Rosemount, MN - 2018.

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Treatment Date	**May 22**	**June 5**	**June 22**
Air Temperature (°F)	70	76	75
Relative humidity (%)	60	43	63
Dewpoint (°F)	58	52	66
Soil Moisture	moist at 1.75”	moist at 2”	moist
Soil Temperature (°F)	69	84	81
Sky	90% clouds	5% clouds	60% clouds
Wind (mph)	S 0-5	E 5-10	NE 0-5
Rainfall before Application			
Week 1 (inch)	0.08	1.71	4.67
Rainfall after Application			
Week 1 (inch)	0.76	0.74	0.57
Week 2 (inch)	1.71	4.21	1.55
Weed Height (inch)			
Common Lambsquarters (Colq)	--	--	1-5
Common ragweed (Corw)	--	--	2-4
Eastern Black Nightshade (Ebns)	--	--	1-1.5
Giant Ragweed (Girw)	--	2-4	2-12
Tall Waterhemp (Tawh)	--	--	1-5
Grass species			
- Giant and Yellow foxtail	--	--	--
- Woolly cupgrass	--	1-3	2-10

Weed Densities in Untreated Check	**(#/m^2)**
Common Lambsquarters (Colq)	17
Common Ragweed (Corw)	3
Eastern Black Nightshade (Ebns)	1
Giant Ragweed (Girw)	35
Tall Waterhemp (Tawh)	27
Grass species	
- Giant and Yellow foxtail	9
- Woolly cupgrass	5

Results

Common lambsquarters, glyphosate resistant giant ragweed, and tall waterhemp were the primary broadleaf weed species present. Light, scattered populations of common ragweed, eastern black nightshade, and velvetleaf were also present. Primary grass species present were giant & yellow foxtail, woolly cupgrass, and late emerging (July) smooth crabgrass. Data is presented in the Table only for the primary weeds species present. Shaded ratings data in the Table represent preemergence weed control prior to the postemergence sequential applications.

Postemergence sequential herbicide applications targeted four inch weeds. Based on the level of preemergence giant ragweed control, the timing of these sequential applications generally would have occurred at three different dates. Poor preemergence control with Warrant, Harness and Sonic lead to an early postemergence application on June 5 for these treatments. TripleFlex II and Callisto + Sencor provided fair to good preemergence control of giant ragweed including some growth reduction, delaying the target 4" weed size until approximately June 14. However, rain and/or wind conditions delayed the sequential postemergence for these two treatments until June 22. By June 22 the giant ragweed in these two treatments ranged from 2" to 12". The preemergence Balance Bean tank mix combinations all provided excellent preemergence control of giant ragweed with significant growth reduction delaying the need for the postemergence sequential application until June 22.

All of the preemergence treatments provided 100% control of the broadleaf species (excluding giant ragweed) and the foxtail species. Scattered woolly cupgrass was present except for the Balance Bean treatments on June 5 (not rated). Postemergence control of all weed species was excellent with a few exceptions. For the June 5 applications, the Roundup treatment resulted in poor control of the glyphosate resistant giant ragweed. The June 22 application of Roundup + Laudis initially caused only chlorosis of the giant ragweed (June 29 rating), however by the July 18 rating, giant ragweed control was 99%. In the Balance Bean treatments, the Roundup/Dual sequential did not provide much postemergence control with the June 29 rating of 98% control reflecting the preemergence residual control.

TripleFlex II/Roundup + Laudis, Callisto + Sencor/Liberty + Dual, and all of the Balance Bean/Post sequential treatments provided excellent long term control of all weed species. In comparison, Warrant, Harness and Sonic with post sequential treatments generally resulted in poorer overall long term weed control. Within this treatment group, XtendiMax, Diflexx Duo, and Liberty resulted in better long term giant ragweed control compared to Roundup or Enlist Duo as the postemergence sequential. The Sonic/Post treatments maintained 100% lambsquarters control throughout the season. All of these treatments had tall waterhemp and grass species (including smooth crabgrass) present at the later rating dates.

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		Weed Control																				
		Girw						Colq					Tawh					grass species				
Treatment	Rate	6/05	6/14	6/20	6/29	7/18	8/10	6/14	6/20	6/29	7/18	8/10	6/14	6/20	6/29	7/18	8/10	6/14	6/20	6/29	7/18	8/10
	(product/A)	(%)																				
Preemergence (May 22) / Postemergence (June 5)																						
Warrant[1] / Roundup[2] + AMS[3]	3 pt / 32 oz + 3 pt	0	40	65	50	32	20	100	100	99	90	87	100	100	100	100	98	100	100	100	98	97
Warrant / Roundup + XtendiMax[4]	3 pt / 32 oz + 22 oz	0	99	100	99	96	85	100	100	100	95	73	100	100	100	97	97	100	100	100	96	86
Harness[5] / Roundup + Diflexx Duo[6] + Destiny HC[7] + AMS	1.25 pt / 28 oz + 24 oz + 9.6 oz + 3 pt	7	99	99	99	96	85	100	100	100	95	87	100	100	100	93	85	100	100	99	98	82
Sonic[8] / Enlist Duo[9]	4 oz / 3.5 pt	22	98	97	94	90	57	100	100	100	100	100	100	100	100	98	93	98	98	99	89	73
Sonic / Enlist One[10] + Roundup + Liberty[11]	4 oz / 1.5 pt + 32 oz + 32 oz	18	97	98	98	93	82	100	100	100	100	100	100	100	100	98	95	100	100	99	93	74
Preemergence (May 22) / Postemergence (June 22)																						
TripleFlex II[12] / Roundup + Laudis[13] + Destiny HC + AMS	2 pt / 32 oz + 3 oz + 9.6 oz + 3 pt	58	23	47	37	99	95	100	100	100	100	100	100	100	100	100	100	98	90	100	100	98
Callisto[14] + Sencor[15] / Liberty + Dual[16] + AMS	6 oz + 6 oz / 32 oz + 16 oz + 3 pt	83	92	91	100	99	97	100	100	100	100	100	100	100	100	100	100	53	57	100	100	99
Balance Bean[17] + Sencor / Liberty + Dual + AMS	3 oz + 6 oz / 32 oz + 16 oz + 3 pt	90	98	97	100	99	95	100	100	100	100	100	100	100	100	100	100	100	100	100	97	99
Balance Bean + Sencor / Roundup + Dual + AMS	3 oz + 6 oz / 32 oz + 16 oz + 3 pt	93	98	98	99	98	95	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Balance Bean + Sencor / Liberty + Roundup + Dual + AMS	3 oz + 6 oz / 32 oz + 32 oz + 16 oz + 3 pt	93	98	99	100	99	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Balance Bean + Zidua[18] / Liberty + Roundup + Outlook[19] + AMS	3 oz + 1.5 oz / 32 oz + 32 oz + 12 oz + 3 pt	87	96	97	100	100	96	100	100	100	100	100	100	100	100	100	100	100	100	100	100	99
LSD (0.05)		9.4	9.0	9.6	15.9	5.8	9.5	ns	ns	0.3	4.3	8.9	ns	ns	ns	ns	ns	20.7	20.7	ns	5.9	ns

[1] Warrant 3CS (3 pts/A) = acetochlor.

[2] Roundup PowerMax 4S (22 oz/A) = glyphosate.

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

[4] ExtendiMax with VapoGrip 2.9SL = dicamba diglycolamine salt.

[5] Harness 7EC = acetochlor.

[6] Diflexx Duo 2.13SC = dicamba diglycolamine salt (1.86 lb ai/gal) & tembotrione (0.27 lb ai/gal).

[7] Destiny HC = methylated soybean oil, high fructose corn syrup, sorbitan fatty acid esters.

[8] Sonic 70DF = 62.1% sulfentrazone & 7.9% chloransulam-methyl.

[9] Enlist Duo 3.3SL = 2,4-D acid choline salt (1.6 lb ae/gal) & glyphosate (1.7 lb ae/gal).

[10] Enlist One 3.3SL = 2,4-D acid choline salt.

[11] Liberty 2.34L = glufosinate-ammonium.

[12] Tripleflex II 2.64 SC = acetochlor (3.75 lb ai/gal) & flumetsulam (0.12 lb ai/gal) & clopyralid (0.29 lb ae/gal).

[13] Laudis 3.5F = tembotrione.

[14] Callisto 4L = mesotrione .

[15] Sencor 75DF = metribuzin.

[16] Dual II Magnum 7.64E = s-metolachlor.

[17] Balance Bean 4SC = isoxaflutole.

[18] Zidua 85WG = pyroxasulfone.

[19] Outlook 6EC = dimethenamid-P.