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Flumioxazin-Imazapic Synergies, Suppression and Control on Roadsides

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Objective:

Evaluate imazapic alone or mixed with flumioxazin for grass height suppression and weed control on Wisconsin roadsides.

Summary:

Interest exists in using imazapic to suppress grass growth on Wisconsin roadsides. If applied correctly, research has shown 1-3 months of grass height suppression allowing roadside managers to skip 1-2 mowing events. This research was evaluating the rate of imazapic needed and if adding flumioxazin would help with suppression. While injury (height reduction) was observed 15, 31 and 43 days after treatment (DAT) no reduction in smooth brome or Kentucky bluegrass (KBG) cover were found with any treatments. Smooth brome and KBG heights were statistically reduced within the first 43 days by high rates of imazapic (6 or 8 fl oz/A) alone or mixed with flumioxazin but high variability prevented differentiation of lower rates. By 56 DAT (July 12, 2022) only height reductions were observed in smooth brome at high rates of imazapic (6 alone, 8 with flumioxazin). Significant seedhead suppression was observed with both smooth brome (>50%) and KBG (>20%) at rates as low as 4 oz/A of imazapic alone or when mixed with flumioxazin. By August (85 DAT) moderate seedhead suppression was maintained with rates as low as 2 oz/A of imazapic. Imazapic kept KBG heights reduced even at low rates, while smooth brome grass height was only reduced by higher rates of imazapic.

Results confirm that imazapic is effective at suppressing grass growth for multiple months. While higher rates of imazapic used (6-8 fl oz/A) significantly reduced height these cause long-lasting reductions to grasses and may be excessive. Lower rates (2-4 fl oz/A), while not significant, did appear to have less height and vigor for 1-3 months. Lack of differences may

be due to the lack of adjuvant or late application timing (1-2 weeks) which may have limited effectiveness. Flumioxazin did appear to have some benefit in grass height suppression, but the late application timing may have limited this. Given its pre-emergence activity and the emergence timing of common weeds in Wisconsin roadsides, applications in early spring (late April) may provide benefit and should be further explored.

Notes

Due to issues involved with shipping trial herbicide, the products Plateau (imazapic) and Chateau (flumioxazin) were mixed as a substitute.

***Due to concern of grass injury from Flumioxazin, NO ADJUVANTS WERE USED. ***

Herbicide Treatments

Treatment Number	Treatment	Rate
1	Nontreated Control (NTC)	-
2	Plateau	1 fl oz/A
3	Plateau	2 fl oz/A
4	Plateau	4 fl oz/A
5	Plateau	6 fl oz/A
6	Plateau	8 fl oz/A
7	Plateau Chateau	1 fl oz/A 0.05 lbs/A
8	Plateau Chateau	2 fl oz/A 0.123 lbs/A
9	Plateau Chateau	4 fl oz/A 0.25 lbs/A
10	Plateau Chateau	6 fl oz/A 0.37 lbs/A
11	Plateau Chateau	8 fl oz/A 0.49 lbs/A

Herbicide Application

Date	May, 17,2022, 11:50am – 1:30pm
Equipment	CO_2 pressurized 10-foot boom sprayer (20 GPA)
Nozzles & spacing	Eight, Teejet XR 11002VS nozzles, with 15-inch spacing
Regulator PSI	48

Weather Data	
Weather Station	KWIMADIS223
Temperature	67˚F - 77˚F
Wind Speed and Direction	0.58 mph SW – 2.88 mph S
Relative Humidity	40%
Cloud Cover	90%
Previous Rain Event Within 48 Hours	None
When ≥ 0.25 inches of precipitation occurred after treatment	9 DAT, 12:15am – 0.45 inches

Research Plot Information	
Plot Dimensions	10 feet by 25 feet
Design	Randomized Complete Block, 4 blocks
Soil Type	Richwood silt loam
Soil Characteristics	20.8% clay, 0.97% organic matter, 6.4 pH, 4% slope

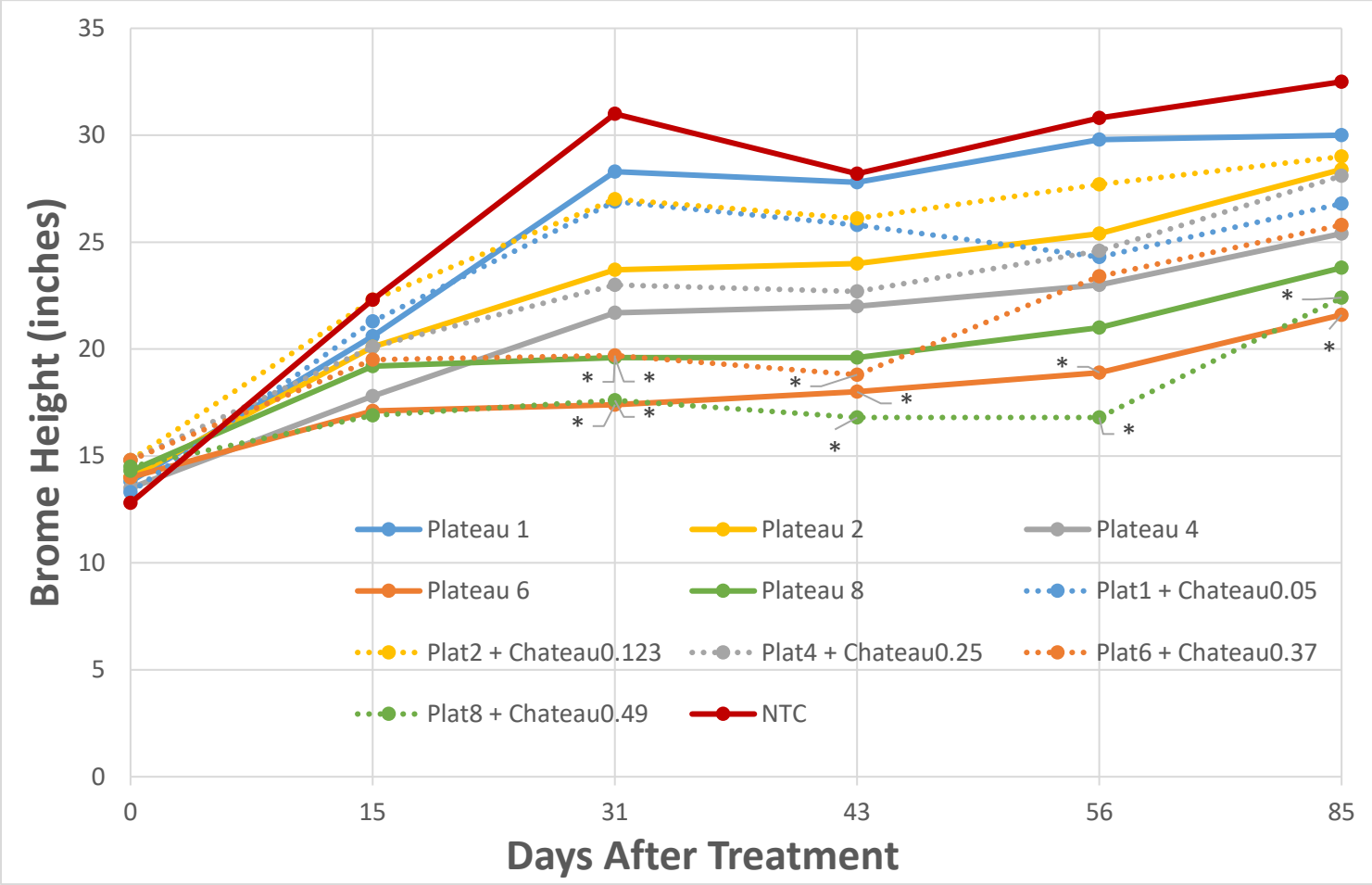
Plants Present at Application – Developmental Stage		
Species	**Average Height (in)**	**Phenological Stage**
Smooth Brome (*Bromus inermis*)	14	Vegetative
Kentucky Bluegrass (*Poa pratensis*)	11	Vegetative

Treatment 1: Nontreated Control @ 85 DAT. Plot is outlined in red.

Treatment 11 : Plateau 8 fl oz/A + Chateau 0.49 lbs/A @ 85 DAT. Plot is outlined in red.*Note injury to grass in front of picture.

Results:

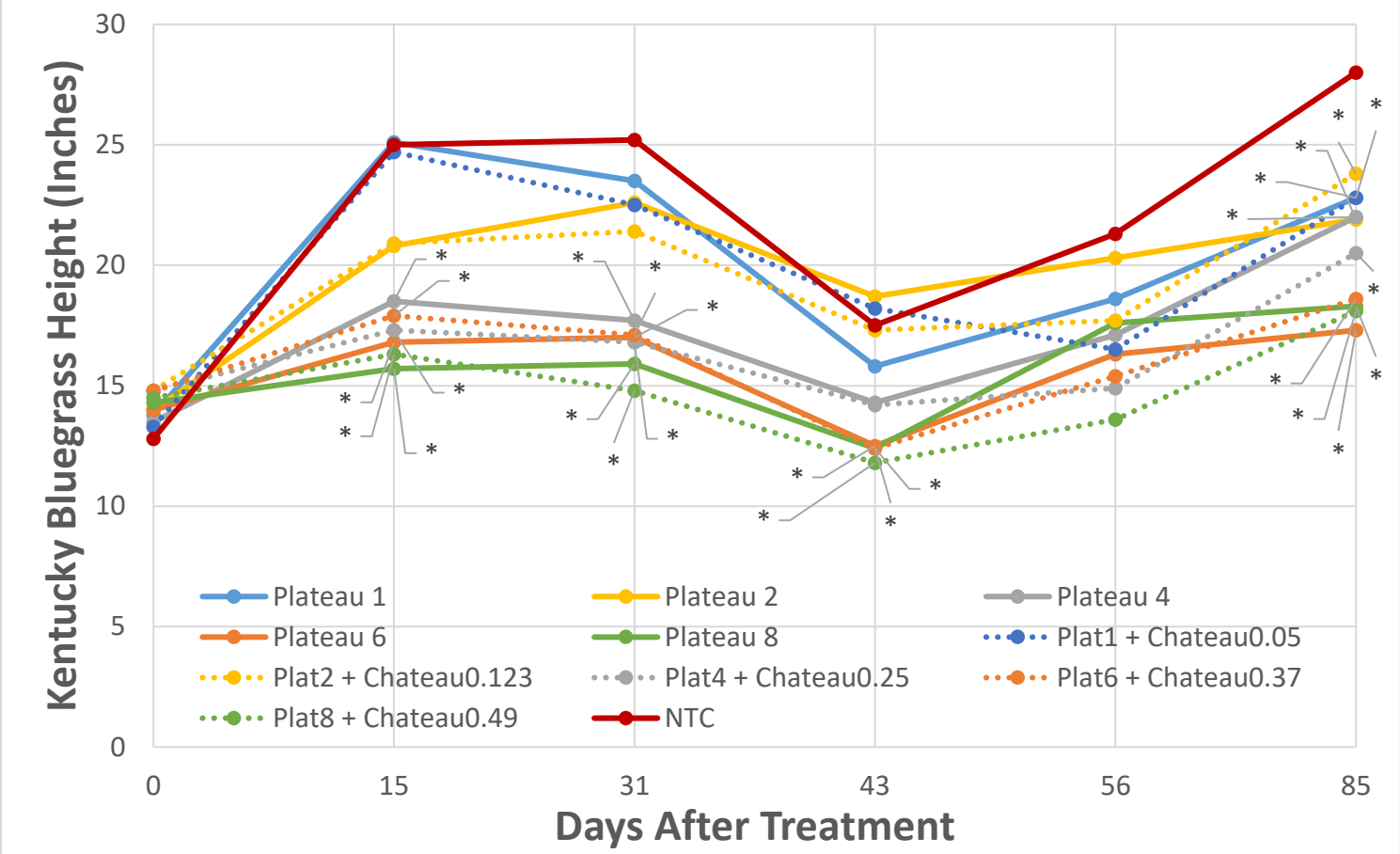
Smooth Brome height throughout season



*Treatment showed significant difference from NTC

Treatments with imazapic alone at 1, 2, 4, 6, and 8 fl oz/A showed similar results when mixed, at the same imazapic rates, with flumioxazin at 0.05, 0.123, 0.5, 0.37, and 0.49 lbs/A, respectively. While only high rates of Plateau (6 fl oz/A and 8 fl oz/A) showed differences in height with analysis of variance, regression analysis likely would find reductions at 2 fl oz/A and 4 fl oz/A if further explored. Smooth brome height remained suppressed at high rates but appeared to recover at lower rates by the end of the year.

Kentucky Bluegrass height throughout season



* Treatment showed significant difference from NTC

Treatments with imazapic alone at 1, 2, 4, 6, and 8 fl oz/A showed similar results when mixed, at the same imazapic rates, with flumioxazin at 0.05, 0.123, 0.25, 0.37, and 0.49 lbs/A, respectively. The addition of flumioxazin did not affect Kentucky bluegrass height. Treatments with higher rates (4fl oz/A and higher) of imazapic had reduced height for most evaluation dates. By fall (85 DAT), imazapic at 6 and 8 fl oz/A had continued reduction in Kentucky Bluegrass height compared to other treatments where height recovered (but was still less than NTC).

Pre-Treatment Rating– May, 17, 2022						
Trt. No.	**Treatment**	**Rate**	**Grass Cover (%)**	**Broadleaf Weed Cover (%)**	**Bareground/ Litter (%)**	**Grass height (inches)**
1	NTC	-	55.0	5.0	40.0	12.8
2	Plateau	1 fl oz/A	57.5	7.5	35.0	13.8
3	Plateau	2 fl oz/A	53.8	6.3	40.0	14.0
4	Plateau	4 fl oz/A	56.3	7.5	36.3	13.5
5	Plateau	6 fl oz/A	56.3	6.3	37.5	14.0
6	Plateau	8 fl oz/A	61.3	4.5	34.3	14.3
7	Plateau Chateau	1 fl oz/A 0.05 lbs/A	55.0	6.3	38.8	13.3
8	Plateau Chateau	2 fl oz/A 0.123 lbs/A	58.8	8.8	32.5	14.8
9	Plateau Chateau	4 fl oz/A 0.25 lbs/A	57.5	6.3	36.3	14.8
10	Plateau Chateau	6 fl oz/A 0.37 lbs/A	58.8	6.3	35.0	14.8
11	Plateau Chateau	8 fl oz/A 0.49 lbs/A	57.5	7.5	36.3	14.5
Statistics[1]						
Least Significant Difference (LSD) P=.05			10.19	3.69	9.12	1.82
Standard Deviation			7.06	2.56	6.32	1.26
Coefficient of Variation (CV)			12.37	39.06	17.29	8.98
Treatment Prob(F)			0.9552	0.5503	0.8291	0.3811

Note: Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

15 Days after Treatment (DAT) – June, 1, 2022 1/2								
Trt. No.	**Treatment**	**Rate**	**Smooth Brome injury (%)**	***Kentucky Bluegrass Injury (%)**	**Wild Parsnip Injury (%)**	**Smooth Brome Height (inches)**	**KBG* Height (inches)**	**Smooth Brome Ht. Reduc. (%)**
1	NTC	-	1.9 c	0.9 d	2.0 b	22.3	25.0 a	0.0 b
2	Plateau	1 fl oz/A	2.8 c	3.2 bcd	5.0 b	20.6	25.1 a	2.4 ab
3	Plateau	2 fl oz/A	2.5 c	1.6 cd	5.0 b	20.1	20.8 ab	4.6 ab
4	Plateau	4 fl oz/A	2.8 c	1.2 cd	5.0 b	17.8	18.5 b	15.7 ab
5	Plateau	6 fl oz/A	4.0 bc	3.6 bcd	5.0 b	17.1	16.8 b	23.6 a
6	Plateau	8 fl oz/A	2.5 c	2.5 bcd	5.0 b	19.2	15.7 b	15.9 ab
7	Plateau Chateau	1 fl oz/A 0.05 lbs/A	2.8 c	4.9 a-d	13.3 b	21.3	24.7 a	5.2 ab
8	Plateau Chateau	2 fl oz/A 0.123 lbs/A	6.0 bc	7.1 abc	22.5 a	22.3	20.9 ab	0.6 ab
9	Plateau Chateau	4 fl oz/A 0.25 lbs/A	14.0 ab	11.9 ab	25.0 a	20.1	17.3 b	19.1 a
10	Plateau Chateau	6 fl oz/A 0.37 lbs/A	12.8 ab	10.2 ab	25.0 a	19.5	17.9 b	12.2 ab
11	Plateau Chateau	8 fl oz/A 0.49 lbs/A	23.7 a	18.2 a	30.0 a	16.9	16.3 b	24.6 a
Statistics[1]								
LSD P=.05			3.87 – 14.11	2.56 – 11.11	8.21	4.85	4.12	11.27 – 18.60
Standard Deviation			0.25t	0.26t	5.21	3.36	2.85	10.79t
CV			32.72t	35.93t	40.15	17.03	14.32	62.06t
Treatment Prob(F)			0.0001	0.0001	0.0001	0.3013	0.0001	0.0036

Note: Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

*Kentucky Bluegrass = KBG

[1] All statistical analyses were conducted in ARM software and assumptions of ANOVA were not evaluated.

15 Days after Treatment (DAT) – June, 1, 2022 2/2							
Trt. No.	**Treatment**	**Rate**	**KBG Height Reduction (%)**	**Smooth Brome Cover (%)**	**KBG Cover (%)**	**Broadleaf Weed Cover (%)**	**Bareground/ Litter (%)**
1	NTC	-	0.0 c	36.8	31.3	5.0 a	26.3 d
2	Plateau	1 fl oz/A	8.8 bc	35.3	23.8	3.0 ab	35.8 bc
3	Plateau	2 fl oz/A	10.0 bc	33.5	27.5	6.5	32.3 bcd
4	Plateau	4 fl oz/A	25.0 ab	36.9	21.3	2.8 ab	37.3 abc
5	Plateau	6 fl oz/A	37.5 a	34.8	31.3	3.8 ab	30.0 cd
6	Plateau	8 fl oz/A	43.0 a	41.2	15.8	4.3 ab	37.5 abc
7	Plateau Chateau	1 fl oz/A 0.05 lbs/A	8.8 bc	36.0	32.5	2.3 ab	29.0 cd
8	Plateau Chateau	2 fl oz/A 0.123 lbs/A	13.8 bc	36.0	25.0	2.3 ab	36.5 bc
9	Plateau Chateau	4 fl oz/A 0.25 lbs/A	40.0 a	43.2	16.3	1.5 b	37.3 abc
10	Plateau Chateau	6 fl oz/A 0.37 lbs/A	32.5 a	34.8	21.8	1.3 b	42.0 ab
11	Plateau Chateau	8 fl oz/A 0.49 lbs/A	42.5 a	33.5	18.8	1.3 b	46.3 a
Statistics[2]							
LSD P=.05			15.35	11.52 – 12.17	13.09	1.93	6.54
Standard Deviation			10.63	0.09t	9.02	1.33	4.53
CV			44.68	5.77t	38.0	48.92	12.77
Treatment Prob(F)			0.0001	0.8376	0.0973	0.0037	0.0001

Note: Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

[2] All statistical analyses were conducted in ARM software and assumptions of ANOVA were not evaluated.

31 DAT – June, 17, 2022 1/2								
Trt. No.	Treatment	Rate	Smooth Brome Injury (%)	KBG Injury (%)	Wild Parsnip Injury (%)	Smooth Brome Height (inches)	KBG Height (inches)	Smooth Brome Ht. Reduc. (%)
1	NTC	-	5.3 e	1.9 c	1.3 c	31.0 a	25.2 a	0.0 d
2	Plateau	1 fl oz/A	9.0 de	4.4 bc	3.0 bc	28.3 ab	23.5 a	10.3 cd
3	Plateau	2 fl oz/A	15.0 de	10.2 abc	28.3 ab	23.7 abc	22.6 a	17.8 bcd
4	Plateau	4 fl oz/A	26.3 bcd	20.8 ab	14.5 abc	21.7 abc	17.7 b	36.3 abc
5	Plateau	6 fl oz/A	35.0 abc	23.7 ab	7.1 abc	17.4 c	17.0 b	56.3 a
6	Plateau	8 fl oz/A	37.5 abc	21.5 ab	8.8 abc	19.6 bc	15.9 b	47.5 ab
7	Plateau Chateau	1 fl oz/A 0.05 lbs/A	20.0 cde	17.4 ab	43.5 a	26.9 abc	22.5 a	20.3 bcd
8	Plateau Chateau	2 fl oz/A 0.123 lbs/A	22.5 b-e	10.4 abc	30.0 ab	27.0 abc	21.4 a	10.3 cd
9	Plateau Chateau	4 fl oz/A 0.25 lbs/A	36.3 abc	21.7 ab	25.0 ab	23.0 abc	16.8 b	35.0 abc
10	Plateau Chateau	6 fl oz/A 0.37 lbs/A	40.0 ab	32.3 a	-	19.7 bc	17.1 b	47.5 ab
11	Plateau Chateau	8 fl oz/A 0.49 lbs/A	50.0 a	29.7 a	70.0 a	17.6 c	14.8 b	60.0 a
Statistics[3]								
LSD P=.05			12.27	9.47 – 17.23	6.30 – 52.07	6.18	3.19	22.02
Standard Deviation			8.50	8.17t	0.36t	4.28	2.21	15.25
CV			31.49	23.77t	30.09t	18.42	11.32	49.19
Treatment Prob(F)			0.0001	0.0010	0.0040	0.0006	0.0001	0.0001

Note: Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

[3] All statistical analyses were conducted in ARM software and assumptions of ANOVA were not evaluated.

31 DAT – June, 17, 2022 2/2							
Trt. No.	**Treatment**	**Rate**	**KBG Ht. Reduc. (%)**	**Smooth Brome Cover (%)**	**KBG Cover (%)**	**Broadleaf Weed Cover (%)**	**Bareground/ Litter (%)**
1	NTC	-	0.0 e	37.5	33.8	6.5	20.8 c
2	Plateau	1 fl oz/A	11.3 de	39.5	26.3	3.4	28.0 abc
3	Plateau	2 fl oz/A	25.0 bcd	35.0	31.3	7.1	22.3 c
4	Plateau	4 fl oz/A	33.8 a-d	32.5	26.8	5.3	33.8 abc
5	Plateau	6 fl oz/A	53.8 ab	26.3	25.0	6.7	41.3 abc
6	Plateau	8 fl oz/A	51.3 ab	31.3	16.3	3.0	48.5 a
7	Plateau Chateau	1 fl oz/A 0.05 lbs/A	21.3 cde	38.8	27.5	5.3	28.0 abc
8	Plateau Chateau	2 fl oz/A 0.123 lbs/A	28.8 a-d	38.8	33.8	3.6	23.8 bc
9	Plateau Chateau	4 fl oz/A 0.25 lbs/A	43.8 abc	31.3	21.3	2.5	44.8 ab
10	Plateau Chateau	6 fl oz/A 0.37 lbs/A	52.5 ab	35.0	26.3	1.4	37.3 abc
11	Plateau Chateau	8 fl oz/A 0.49 lbs/A	56.3 a	30.0	28.8	2.1	38.8 abc
Statistics[4]							
LSD P=.05			18.63	9.69	14.45	3.02 – 4.51	13.58
Standard Deviation			12.90	6.71	10.00	0.25t	9.40
CV			37.6	19.64	37.09	35.79t	28.18
Treatment Prob(F)			0.0001	0.1475	0.4183	0.0634	0.0014

Note: Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

[4] All statistical analyses were conducted in ARM software and assumptions of ANOVA were not evaluated.

43 DAT – June, 29, 2022 1/2								
Trt. No.	Treatment	Rate	Smooth Brome Injury (%)	KBG Injury (%)	Wild Parsnip Injury (%)	Smooth Brome Ht. (Inches)	KBG Ht. (Inches)	Smooth Brome Ht. Reduc. (%)
1	NTC	-	6.5 d	4.3 d	6.3 d	28.2 a	17.5 a	0.0
2	Plateau	1 fl oz/A	6.3 d	6.0 cd	10.2 ab	27.8 ab	15.8 ab	13.8 ab
3	Plateau	2 fl oz/A	13.8 cd	9.5 a-d	21.1 ab	24.0 abc	18.7 a	18.0 ab
4	Plateau	4 fl oz/A	21.3 bc	9.1 a-d	15.6 ab	22.0 abc	14.3 ab	42.5 ab
5	Plateau	6 fl oz/A	25.0 b	18.3 ab	13.4 ab	18.0 c	12.5 b	61.3 a
6	Plateau	8 fl oz/A	33.8 ab	14.8 abc	31.7 ab	19.6 abc	12.4 b	61.3 a
7	Plateau Chateau	1 fl oz/A 0.05 lbs/A	6.3 d	7.9 bcd	15.6 ab	25.8 abc	18.2 a	21.5 ab
8	Plateau Chateau	2 fl oz/A 0.123 lbs/A	12.5 cd	7.9 bcd	35.4 ab	26.1 abc	17.3 a	11.3 b
9	Plateau Chateau	4 fl oz/A 0.25 lbs/A	26.3 b	11.7 a-d	15.0 ab	22.7 abc	14.2 ab	38.8 ab
10	Plateau Chateau	6 fl oz/A 0.37 lbs/A	33.8 ab	17.3 abc	-	18.8 bc	12.4 b	46.3 ab
11	Plateau Chateau	8 fl oz/A 0.49 lbs/A	38.8 a	25.3 a	60.0 a	16.8 c	11.8 b	48.8 ab
Statistics[5]								
LSD P=.05			9.03	4.58 – 12.20	13.61 – 39.62	5.70	3.11	29.58
Standard Deviation			6.25	0.19t	0.29t	3.94	2.15	20.39
CV			30.7	17.51t	22.64t	17.36	14.35	56.12
Treatment Prob(F)			0.0001	0.0003	0.0316	0.0012	0.0001	0.0059

Note: Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

[5] All statistical analyses were conducted in ARM software and assumptions of ANOVA were not evaluated.

43 DAT – June, 29, 2022 2/2							
Trt. No.	**Treatment**	**Rate**	**KBG Ht. Reduc. (%)**	**Smooth Brome Cover (%)**	**KBG Cover (%)**	**Broadleaf Weed Cover (%)**	**Bareground/ Litter (%)**
1	NTC	-	0.0 d	32.2 -	32.5 -	10.5 -	24.5 b
2	Plateau	1 fl oz/A	13.8 cd	41.1 -	27.5 -	11.8 -	19.5 b
3	Plateau	2 fl oz/A	13.8 cd	33.7 -	31.3 -	11.5 -	23.5 b
4	Plateau	4 fl oz/A	30.0 bc	34.7 -	27.5 -	16.3 -	21.3 b
5	Plateau	6 fl oz/A	43.8 ab	28.6 -	30.0 -	15.0 -	26.3 ab
6	Plateau	8 fl oz/A	53.8 ab	32.2 -	20.0 -	10.0 -	37.5 ab
7	Plateau Chateau	1 fl oz/A 0.05 lbs/A	17.8 cd	36.0 -	30.0 -	11.3 -	22.5 b
8	Plateau Chateau	2 fl oz/A 0.123 lbs/A	11.3 cd	36.2 -	31.3 -	10.0 -	22.5 b
9	Plateau Chateau	4 fl oz/A 0.25 lbs/A	28.8 bc	35.6 -	23.8 -	10.0 -	30.0 ab
10	Plateau Chateau	6 fl oz/A 0.37 lbs/A	37.5 abc	31.0 -	32.5 -	5.0 -	31.3 ab
11	Plateau Chateau	8 fl oz/A 0.49 lbs/A	57.5 a	28.3 -	22.5 -	6.8 -	42.0 a
Statistics[6]							
LSD P=.05			18.26	15.74 – 16.08	13.93	8.34	11.50
Standard Deviation			12.65	6.67t	9.65	5.78	7.96
CV			45.2	18.85t	34.38	53.84	29.12
Treatment Prob(F)			0.0001	0.9047	0.6440	0.3238	0.0063

Note: Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

[6] All statistical analyses were conducted in ARM software and assumptions of ANOVA were not evaluated.

56 DAT – July, 12, 2022 1/2						
Trt. No.	**Treatment**	**Rate**	**Smooth Brome Ht. Reduc. (%)**	**KBG Ht. Reduc. (%)**	**Smooth Brome Ht. (Inches)**	**KBG Ht. (Inches)**
1	NTC	-	0.0 c	0.0 c	30.8 a	21.3 -
2	Plateau	1 fl oz/A	1.4 bc	0.1 c	29.8 a	18.6 -
3	Plateau	2 fl oz/A	7.2 abc	1.9 bc	25.4 abc	20.3 -
4	Plateau	4 fl oz/A	14.1 ab	6.6 abc	23.0 abc	17.1 -
5	Plateau	6 fl oz/A	53.1 a	32.4 a	18.9 bc	16.3 -
6	Plateau	8 fl oz/A	31.0 ab	24.4 ab	21.0 abc	17.6 -
7	Plateau Chateau	1 fl oz/A 0.05 lbs/A	9.3 abc	1.5 bc	24.3 abc	16.5 -
8	Plateau Chateau	2 fl oz/A 0.123 lbs/A	6.5 abc	1.9 bc	27.7 ab	17.7 -
9	Plateau Chateau	4 fl oz/A 0.25 lbs/A	8.7 abc	10.3 abc	24.6 abc	14.9 -
10	Plateau Chateau	6 fl oz/A 0.37 lbs/A	32.1 ab	21.9 ab	23.4 abc	15.4 -
11	Plateau Chateau	8 fl oz/A 0.49 lbs/A	51.0 a	23.0ab	16.8 c	13.6 -
Statistics[7]						
LSD P=.05			10.36 – 43.97	7.28 – 20.23	6.18	5.80
Standard Deviation			0.50t	9.89t	4.28	4.02
CV			46.97t	60.83t	17.71	23.36
Treatment Prob(F)			0.0005	0.0001	0.0014	0.2975

Note: Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

[7] All statistical analyses were conducted in ARM software and assumptions of ANOVA were not evaluated.

56 DAT – July, 12, 2022 2/2						
Trt. No.	**Treatment**	**Rate**	**Smooth Brome Seed Suppression (%)**	**KBG Seed Suppression (%)**	**Smooth Brome Injury (%)**	**KBG Injury (%)**
1	NTC	-	0.0 c	0.0 b	4.7 e	1.6 -
2	Plateau	1 fl oz/A	27.5 bc	9.2 ab	7.3 de	1.6 -
3	Plateau	2 fl oz/A	36.3 bc	13.1 ab	17.5 bcd	3.6 -
4	Plateau	4 fl oz/A	60.0 ab	21.1 ab	32.6 ab	3.7 -
5	Plateau	6 fl oz/A	78.8 ab	17.4 ab	43.3 a	10.4 -
6	Plateau	8 fl oz/A	76.0 ab	46.6 a	44.8 a	10.2 -
7	Plateau Chateau	1 fl oz/A 0.05 lbs/A	37.5 bc	15.0 ab	10.8 cde	5.2 -
8	Plateau Chateau	2 fl oz/A 0.123 lbs/A	41.3 bc	39.3 a	9.7 de	2.5 -
9	Plateau Chateau	4 fl oz/A 0.25 lbs/A	56.3 ab	14.3 ab	23.4 bc	4.3 -
10	Plateau Chateau	6 fl oz/A 0.37 lbs/A	64.3 ab	30.0 ab	27.2 ab	10.1 -
11	Plateau Chateau	8 fl oz/A 0.49 lbs/A	94.8 a	36.7 a	48.3 a	11.9 -
Statistics[8]						
LSD P=.05			33.48	29.56 – 32.32	7.43 – 16.14	4.67 – 8.27
Standard Deviation			23.19	14.44t	0.88t	0.31t
CV			44.55	55.12t	18.57t	39.74t
Treatment Prob(F)			0.0002	0.0158	0.0001	0.0125

Note: Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

[8] All statistical analyses were conducted in ARM software and assumptions of ANOVA were not evaluated.

85 DAT – August, 10, 2022 1/2						
Trt. No.	**Treatment**	**Rate**	**Smooth Brome Ht. Reduc. (%)**	**KBG Ht. Reduc. (%)**	**Smooth Brome Ht. (Inches)**	**KBG Ht. (Inches)**
1	NTC	-	0.0 b	0.0 d	32.5 a	28.0 a
2	Plateau	1 fl oz/A	6.6 ab	3.2 c	30.0 ab	22.8 b
3	Plateau	2 fl oz/A	16.7 a	5.5 ab	28.4 ab	21.9 b
4	Plateau	4 fl oz/A	19.9 a	7.3 abc	25.4 ab	22.0 b
5	Plateau	6 fl oz/A	35.8 a	11.2 ab	21.6 b	17.3 c
6	Plateau	8 fl oz/A	26.4 a	8.6 abc	23.8 ab	18.3 c
7	Plateau Chateau	1 fl oz/A 0.05 lbs/A	15.9 a	6.9 bc	26.8 ab	22.8 b
8	Plateau Chateau	2 fl oz/A 0.123 lbs/A	11.5 ab	6.1 bc	29.0 ab	23.8 b
9	Plateau Chateau	4 fl oz/A 0.25 lbs/A	6.6 ab	7.4 abc	28.1 ab	20.5 bc
10	Plateau Chateau	6 fl oz/A 0.37 lbs/A	18.3 a	10.7 ab	25.8 ab	18.6 c
11	Plateau Chateau	8 fl oz/A 0.49 lbs/A	33.9 a	14.9 a	22.4 b	18.1 c
Statistics[9]						
LSD P=.05			19.70 – 23.18	3.60 – 5.47	5.79	2.34
Standard Deviation			11.05t	0.54t	4.01	1.62
CV			48.16t	19.87t	15.02	7.61
Treatment Prob(F)			0.0031	0.0001	0.0157	0.0001

Note: Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

[9] All statistical analyses were conducted in ARM software and assumptions of ANOVA were not evaluated.

85 DAT – August, 10, 2022 2/2						
Trt. No.	**Treatment**	**Rate**	**Smooth Brome Seed Suppression (%)**	**KBG Seed Suppression (%)**	**Smooth Brome Injury (%)**	**KBG Injury (%)**
1	NTC	-	0.0 c	0.0 b	8.5 -	3.0 -
2	Plateau	1 fl oz/A	11.9 b	1.4 ab	11.9 -	4.3 -
3	Plateau	2 fl oz/A	25.4 ab	1.9 ab	15.8 -	7.1 -
4	Plateau	4 fl oz/A	33.7 ab	6.2 ab	18.4 -	3.6 -
5	Plateau	6 fl oz/A	62.0 a	7.9 ab	25.5 -	7.9 -
6	Plateau	8 fl oz/A	42.5 ab	19.2 a	17.4 -	3.6 -
7	Plateau Chateau	1 fl oz/A 0.05 lbs/A	35.5 ab	8.5 ab	15.8 -	7.2 -
8	Plateau Chateau	2 fl oz/A 0.123 lbs/A	34.1 ab	5.2 ab	14.6 -	3.6 -
9	Plateau Chateau	4 fl oz/A 0.25 lbs/A	29.0 ab	15.3 a	11.5 -	1.6 -
10	Plateau Chateau	6 fl oz/A 0.37 lbs/A	39.9 ab	22.6 a	20.3 -	3.0 -
11	Plateau Chateau	8 fl oz/A 0.49 lbs/A	66.2 a	19.9 a	18.6 -	9.2 -
Statistics[10]						
LSD P=.05			24.51 – 35.17	8.23 – 18.17	9.23 – 13.11	3.98 – 9.11
Standard Deviation			1.77t	0.44t	0.20t	0.27t
CV			31.63t	50.58t	16.79t	36.98t
Treatment Prob(F)			0.0001	0.0016	0.2064	0.1041

Note: Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

[10] All statistical analyses were conducted in ARM software and assumptions of ANOVA were not evaluated.