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Effectiveness of fall applications of florpyrauxifen on wild parsnip

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Objective:

Determine the effectiveness of florpyrauxifen (SiteVue) in controlling wild parsnip in an establishing prairie when applied in the fall.

Summary:

Wild parsnip is a problematic invasive plant in Wisconsin. It has been observed infesting native, forb rich, prairies where limited tools for management are available that do not also injure native forbs. A new product, florpyrauxifen (SiteVue), has shown promise in controlling wild parsnip while not harming native forbs, but field trials need to confirm this observation. This experiment is evaluating the effectiveness of florpyrauxifen from fall applications. This project is similar to other projects evaluating spring effectiveness of florpyrauxifen in areas previously burned (22-6) and not burned (22-5). Results from June (246 DAT) showed that all treatments reduced wild parsnip to low numbers (< 3 per plot) and July (279 DAT) showed that all treatments reduced flowering parsnip to low numbers (< 1 per plot). This suggests that florpyrauxifen alone or mixed with other products is extremely effective at suppressing wild parsnip. While not tested, this research also suggests that fall timing is the most effective time to remove flowering parsnip plants. The only drawback is that seedings that germinate the following spring are not inhibited by any of these treatments.

Notes

Trial area was mowed to 10 inches 1 month prior to application to help expose wild parsnip and make applications easier as herbicide would contact the parsnip rosettes.

Herbicide Treatments

Treatment Number	Treatment	Rate
1	Nontreated Control (NTC)	-
2	SiteVue	2 fl oz/A
3	SiteVue	4 fl oz/A
4	SiteVue	6 fl oz/A
5	SiteVue	8 fl oz/A
6	SiteVue Escort	4 fl oz/A 0.25 oz/A
7	SiteVue Freelexx (2,4-D Choline)	4 fl oz/A 1 fl oz/A
8	SiteVue Plateau	4 fl oz/A 2 fl oz/A

***Each treatment includes Methylated Seed Oil (MSO) at a rate of 1 % v/v**

Herbicide Application

Date	October 4, 2022, 4:15 pm – 5:02 pm
Equipment	CO_2 pressurized 10-foot boom sprayer (20 GPA)
Nozzles & spacing	8, Teejet XR 11002VS nozzles with 15-inch spacing
Regulator PSI	46

Weather Data

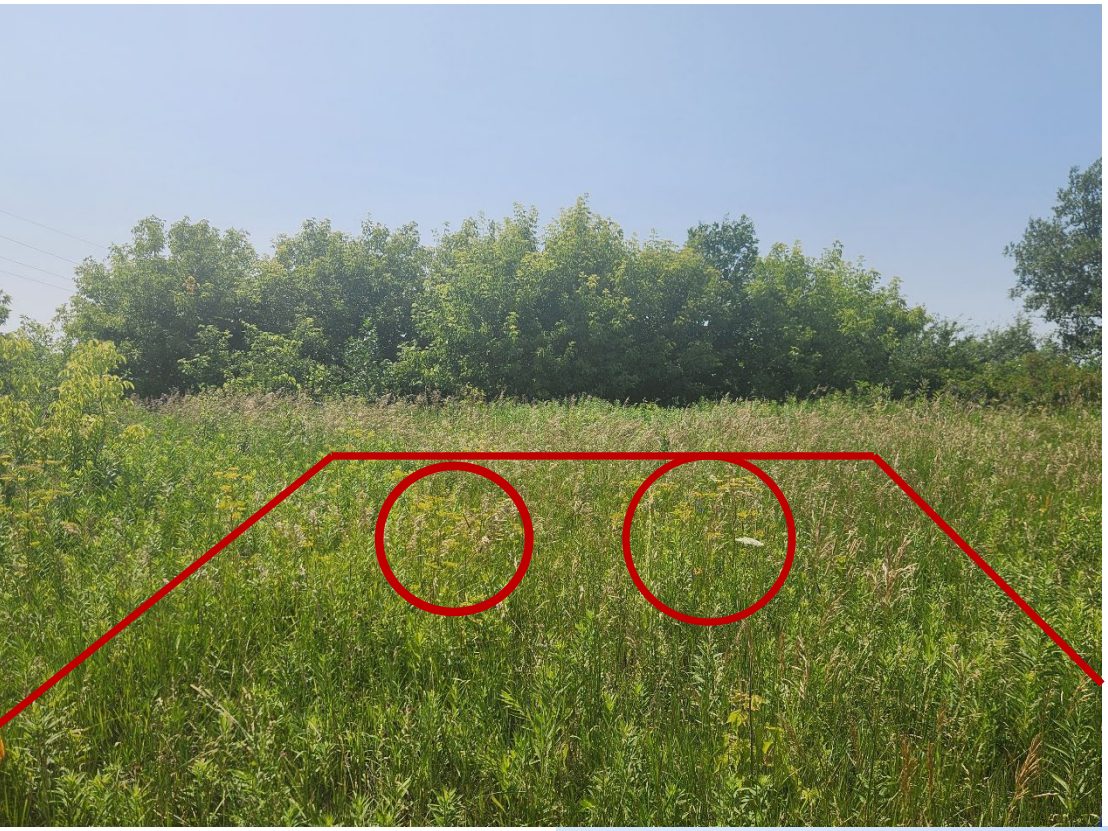
Weather Station	
Temperature	75.7°F – 71.3°F
Wind Speed and Direction	3.5 mph S
Relative Humidity	38% - 44%
Cloud Cover	100%
Previous Rain Event Within 48 Hours	None
When ≥ 0.25 inches of precipitation occurred after treatment	November 4, 2022 – 0.25 inches

Research Plot Information	
Plot Dimensions	10 feet by 25 feet
Design	Randomized Complete Block, 4 blocks
Soil Type	Jewett silt loam, sandy substrate
Soil Characteristics	10.8% clay, 0.63% organic matter, 5.7 pH, 4 % slope

Plants Present at Application – Developmental Stage		
Species	**Average Height (in)**	**Phenological Stage**
wild parsnip (*Pastinaca sativa*)	10	Vegetative

Trial done in an establishing prairie that had been previously mowed.

Close up of wild parsnip rosette just before application – October 4, 2022



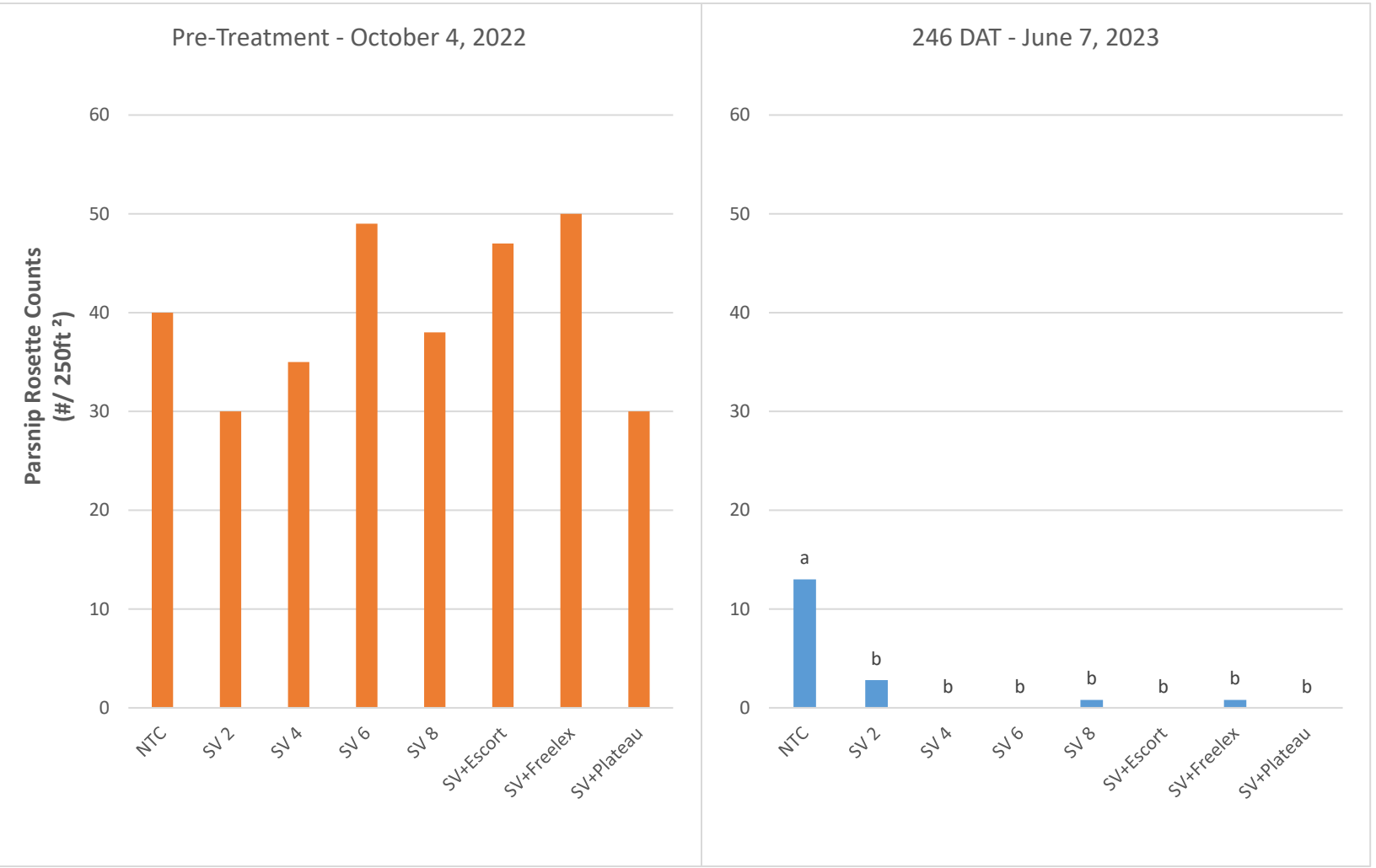
Picture to the left shows a Nontreated Control plot 278 DAT. Notice flowering parsnip in the middle of the plots indicated with red circles.

Picture to the right shows a plot that has been treated with Sitevue 4 fl oz/a + Escort @ 0.25 oz/a, 279 DAT. Notice the lack of parsnip in the plot area but found directly outside of the plot. Shown with red arrows.

Index of Ratings and Results

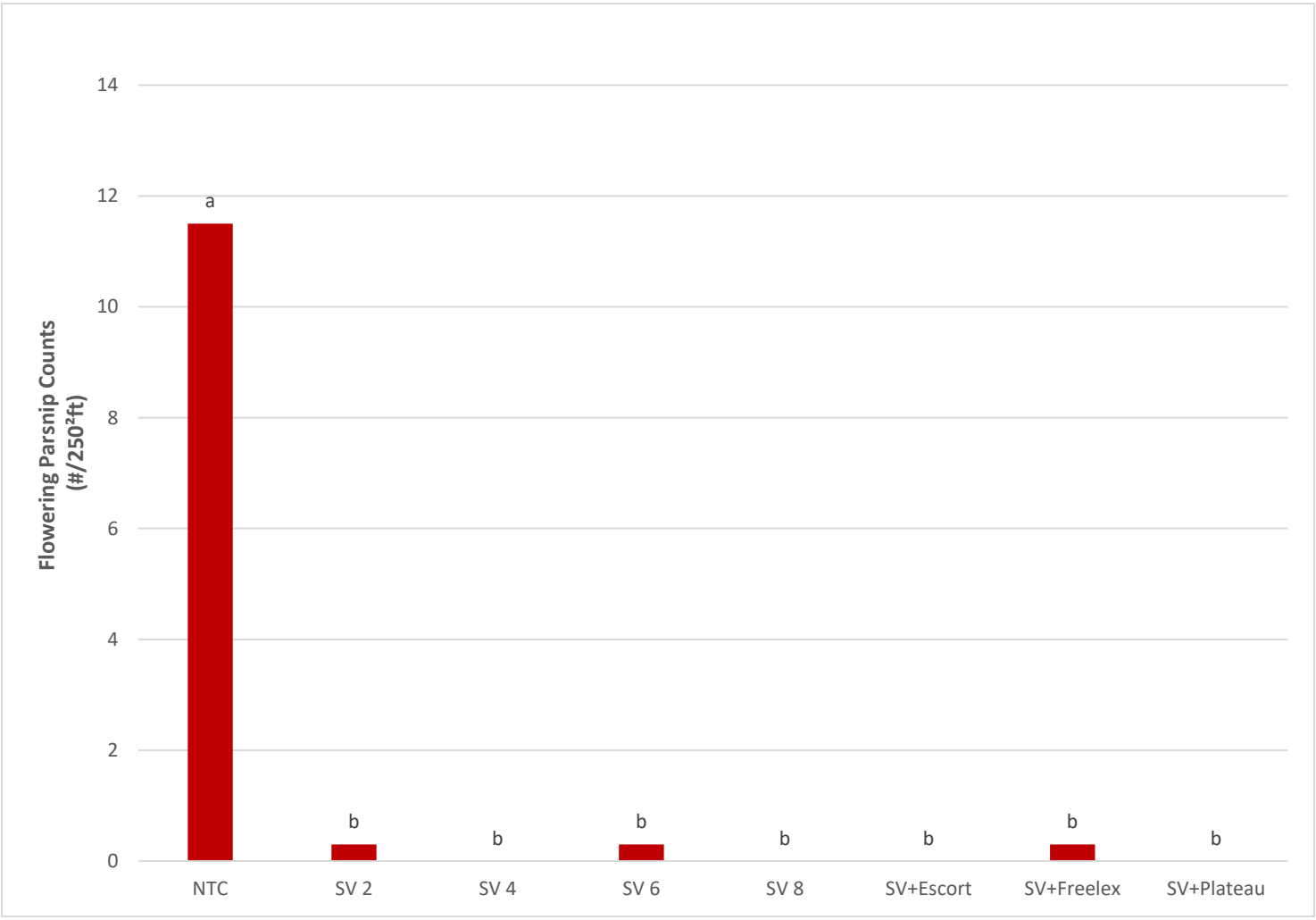
Results:

Wild Parsnip Rosette Counts



Bars labeled with the same letter do not significantly differ (P=0.05, LSD)

Flowering Parsnip Counts 279 DAT – July 10, 2023



Bars labeled with the same letter do not significantly differ (P=0.05, LSD)

Pre-treatment rating – October 4, 2022						
Trt. No.	**Treatment**	**Rate**	**Parsnip Rosette Counts (#/ 250ft ²)**	**Wild Parsnip Cover (%)**	**Grasses Cover (%)**	**Bareground/ Litter Cover (%)**
1	NTC	-	40 -	6 -	63 -	32 -
2	SiteVue	2 fl oz/A	30 -	4 -	73 -	23 -
3	SiteVue	4 fl oz/A	35 -	4 -	65 -	32 -
4	SiteVue	6 fl oz/A	49 -	5 -	68 -	28 -
5	SiteVue	8 fl oz/A	38 -	4 -	70 -	26 -
6	SiteVue Escort	4 fl oz/A 0.25 oz/A	47 -	6 -	66 -	29 -
7	SiteVue Freelex	4 fl oz/A 1 fl oz/A	50 -	4 -	64 -	30 -
8	SiteVue Plateau	4 fl oz/A 2 fl oz/A	30 -	4 -	68 -	29 -
Statistics[1]						
Least Significant Difference (LSD) P=.05			22.63	2.44	9.17	8.60
Standard Deviation			15.39	1.66	6.23	5.85
Coefficient of Variation (CV)			38.71	37.6	9.33	20.58
Treatment Prob(F)			0.3715	0.2558	0.3905	0.4322

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

246 Days after Treatment (DAT) – June 7, 2023				
Trt. No.	**Treatment**	**Rate**	**Parsnip Rosette Counts (#/ 250ft ²)**	**Parsnip Seedling Presence (1=Yes/0=No)**
1	NTC	-	57.8 -	0.8 -
2	SiteVue	2 fl oz/A	2.8 -	0.8 -
3	SiteVue	4 fl oz/A	0 -	0.8 -
4	SiteVue	6 fl oz/A	0 -	1 -
5	SiteVue	8 fl oz/A	0.8 -	1 -
6	SiteVue Escort	4 fl oz/A 0.25 oz/A	0 -	1 -
7	SiteVue Freelex	4 fl oz/A 1 fl oz/A	0.8 -	0.8 -
8	SiteVue Plateau	4 fl oz/A 2 fl oz/A	0 -	1 -
Statistics[2]				
Least Significant Difference (LSD) P=.05			47.03	0.53
Standard Deviation			31.98	0.36
Coefficient of Variation (CV)			412.68	41.36
Treatment Prob(F)			0.1902	0.7905

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

279 DAT – July 10, 2023								
Trt. No.	**Treatment**	**Rate**	**Flowering Parsnip Counts (#/ 250ft ²)**	**Native Grasses Cover (%)**	**Non-Native Grasses Cover (%)**	**Native Forb Cover (%)**	**Non-Native Forb Cover (%)**	**Bareground / Litter Cover (%)**
1	NTC	-	11.5 a	1.3-	66.3 -	7.5 -	20 -	5 -
2	SiteVue	2 fl oz/A	0.3 b	0 -	72.5 -	7.5 -	16.3 -	3.8 -
3	SiteVue	4 fl oz/A	0 b	0 -	75 -	6.3 -	16.3 -	2.5 -
4	SiteVue	6 fl oz/A	0.3 b	1.3 -	73.8 -	7.5 -	12.5 -	5 -
5	SiteVue	8 fl oz/A	0 b	0 -	70 -	8.8 -	16.3 -	5 -
6	SiteVue Escort	4 fl oz/A 0.25 oz/A	0 b	0 -	72.5 -	11.3 -	12.5 -	3.8 -
7	SiteVue Freelex	4 fl oz/A 1 fl oz/A	0.3 b	0 -	72.3 -	7.8 -	12.5 -	7.5 -
8	SiteVue Plateau	4 fl oz/A 2 fl oz/A	0 b	2.5 -	67.5 -	12.5 -	13.8 -	3.8 -
Statistics[3]								
Least Significant Difference (LSD) P=.05			6.22	2.41	10.44	6.73	6.37	4.79
Standard Deviation			4.23	1.64	7.10	4.57	4.33	3.26
Coefficient of Variation (CV)			276.03	261.86	9.97	53.03	28.87	71.86
Treatment Prob(F)			0.0100	0.2839	0.6430	0.5402	0.2134	0.5731

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