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Controlling Wild Parsnip in a Native Prairie

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Objective:

Evaluate the effectiveness of florpyrauxifen-benzyl alone or mixed with imazapic in controlling wild parsnip and measure the impact on desirable native forbs in forb-rich prairies.

Summary:

Wild parsnip is an invasive perennial invading and displacing native forbs within Wisconsin prairies. 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 at low rates while not harming native forbs, but field trials need to confirm this observation. Experiments were established in 2023 to evaluate if florpyrauxifen alone or mixed with imazapic would effectively control wild parsnip and how these applications would change native forbs.

Initial results demonstrated that florpyrauxifen was impacting wild parsnip. While both treatments injured wild parsnip only florpyrauxifen mixed with imazapic reduced flowering wild parsnip density (68%) 22 days after treatment (DAT). By August (43 DAT) both treatments reduced wild parsnip density, but only the mixture effectively reduced flowering parsnip (80%). Many flowering plants were heavily injured and likely had reduced seed viability.

Florpyrauxifen was impacting native forbs. We observed injury to all native forbs, but injury never exceeded 70% in treated areas except for cup plant which exceeded 80%. Cup plant was also heavily injured by insects in all treatments (NTC 50%), therefore this is likely why injury is

elevated. The moderate to high injury from herbicides is a concern, but future data collection in 2024 will determine if plants recover and if control of wild parsnip and elimination of the competition offsets the injury observed.

Notes

Trial was done in a prairie with 31 different forb species with inconsistency and patchiness throughout trial area. The most common native forb species being cup plant, bergamot, black-eyed Susan, golden alexander, and yellow cone flower. The most common nonnative forb species being wild parsnip.

Herbicide Treatments

Treatment Number	Treatment	Rate
1	Non-Treated Control (NTC)	-
2	SiteVue	8 fl oz/a
3	SiteVue Plateau	6 fl oz/a 2 fl oz/a

Herbicide Application

Date	June 19, 2023, 9:00am-10:30am
Equipment	Gator Pros
Nozzles & spacing	180-10 nozzle
Regulator PSI	30

Weather Data

Weather Station	KMNSAINT545
Temperature	73°F - 78°F
Wind Speed and Direction	3 mph – 7 mph
Relative Humidity	80%
Cloud Cover	0%
Previous Rain Event Within 48 Hours	June 18, 2023 – 0.01 inches
When ≥ 0.25 inches of precipitation occurred after treatment	June 25, 2023, 2:53 am – 0.28 inches

Research Plot Information

Plot Dimensions	50’ x 10’
Design	Randomized Complete Block, 4 blocks
Soil Type	Santiago silt loam
Soil Characteristics	14.1% clay, 0.58% organic matter, 5.9 pH, 4% slope

Plants Present at Application – Developmental Stage		
Species	**Average Height (in)**	**Phenological Stage**
Wild Parsnip	12''	Bolting/ Flowers developing
Golden Alexander	25''	Flowering
Yellow Cone Flower	20''	Bolting
Cup Plant	18''	Vegetative

Index of Ratings and Results

Results:

22 Days After Treatment (DAT) – July 12, 2023							
Trt. No.	Treatment	Rate	Black-eyed Susan Injury (%)	Bergamot Injury (%)	Cup Plant Injury (%)	Golden Alexander Injury (%)	Yellow Cone Flower Injury (%)
1	Non-Treated Control (NTC)	-	7 b	2 b	50 b	1 b	0 c
2	SiteVue	8 fl oz/a	43 a	50 a	78 a	47 a	48 b
3	SiteVue Plateau	6 fl oz/a 2 fl oz/a	47 a	63 a	84 a	48 a	68 a
Treatment Prob(F)			< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

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

22 DAT – July 12, 2023						
Trt. No.	Treatment	Rate	Flowering Parsnip Counts	Non-Flowering Parsnip Counts	Total Parsnip Counts	Parsnip Injury (%)
1	Non-Treated Control (NTC)	-	16 a	43 -	59 -	4 b
2	SiteVue	8 fl oz/a	11 ab	25 -	36 -	65 a
3	SiteVue Plateau	6 fl oz/a 2 fl oz/a	5 b	42 -	46 -	71 a
Statistics[1]						
Treatment Prob(F)			0.040	0.951	0.542	0.001

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

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

43 DAT – August 2, 2023					
Trt. No.	**Treatment**	**Rate**	**Flowering Parsnip Counts**	**Non-Flowering Parsnip Counts**	**Total Parsnip Counts**
1	Non-Treated Control (NTC)	-	21 a	34 -	55 a
2	SiteVue	8 fl oz/a	13 a	12 -	25 b
3	SiteVue Plateau	6 fl oz/a 2 fl oz/a	4 b	17 -	21 b
Statistics[2]					
Treatment Prob(F)			0.0021	0.1306	0.0151

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.