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UW – Madison Weed Science Renz Lab

Forb Tolerance to IPT Management - Waubesa

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Objective:

Determine the tolerance of native forb species to herbicides commonly used in prairie settings when treating shrubs with the individual plant treatment methods.

Summary:

Shrub encroachment into prairies is a major problem. While a range of herbicides and methods are effective at removal little is known on the damage and recovery of forbs after treatment. Experiments were established in summer 2023 to access the injury and recover from foliar vs cut surface applications using common herbicides. Foliar treatments were either Durango+Arsenal (glyphosate + imazapyr) or TerraVue + Vastlan (aminopyralid + florpyrauxifen + triclopyr) and the cut surface treatment was Remedy + Milestone (Triclopyr + aminopyralid). All treatments were compared to a non-treated control.

Forty one days after application the cut surface application of Remedy + Milestone and foliar application of Durango + Arsenal provided excellent control (92-100 % control), while the foliar treatment of TerraVue and Vastlan was only moderately effective (62% control).

Injuries to grasses and native forbs differed among treatments the year of application. Grass injury was only observed with the foliar treatment that included Arsenal (imazapyr). While injury was high underneath the shrub (58%) it was observed within 3 ft of the dripline of each (9%) 41 DAT. No grass injury was observed further than three feet away from the Arsenal treated shrubs. Forb injury was not able to be detected as forbs has senesced by the time of 41 DAT rating (September 28, 2023). Early senescence was likely due to drought conditions at the location.

While initial results look promising, measurements 1 year after treatment are needed to accurately assess control and impact to native forbs.

Notes

Trial was located in a restored tallgrass prairie with >5 native forb species per plot (within 6 ft of a bush honeysuckle shrub). The main native forb species present included aster, bergamot, Canada goldenrod, showy tick-trefoil and yellow coneflower.

Trial area experienced drought conditions during the summer of summer/early fall of 2023 and that may impact results.

Herbicide Treatments

Treatment Number	Treatment	Rate	Application Method
1	Nontreated Control (NTC)	-	-
2	TerraVue Vastlan Methylated Seed Oil (MSO)	0.18 oz/gal 2% v/v 0.5% v/v	Foliar
3	Remedy Ultra Milestone Aqumix Basal Oil	20% v/v 1% v/v 79% v/v	Cut Surface
4	Durango Arsenal MSO	4% v/v 0.5% v/v 0.5% v/v	Foliar

Herbicide Application

Application Method	Foliar (A)	Cut surface (B)
Date	August 18, 2023, 10:45 am – 12:11 pm	
Equipment	CO_2 pressurized single nozzle sprayer (20 GPA)	1.5 Liter Hand Sprayer
Nozzles & spacing	1 nozzle, TeeJet 11002 VS	Single
Regulator PSI	48	Hand Pumped

Weather Data	
Weather Station	KWISTOUG29
Temperature	71°F - 73°F
Wind Speed and Direction	5 mph SW – 7 mph SSW
Relative Humidity	42%
Cloud Cover	60%
Previous Rain Event Within 48 Hours	None
When ≥ 0.25 inches of precipitation occurred after treatment	September 11, 2023, 6:05 am– 0.3 inches

Research Plot Information	
Plot Dimensions	Single Shrub + 6 foot radius from dripline
Design	Randomized Complete Block, each shrub was an exp. Unit, 6 blocks
Soil Type	St. Charles loam
Soil Characteristics	18.6% clay, 0.82% organic matter, 6.7 pH, 4% slope

Plants Present at Application – Developmental Stage		
Species	**Average Height (in)**	**Phenological Stage**
Honeysuckle (*Lonicera sp.*)	60	Vegetative

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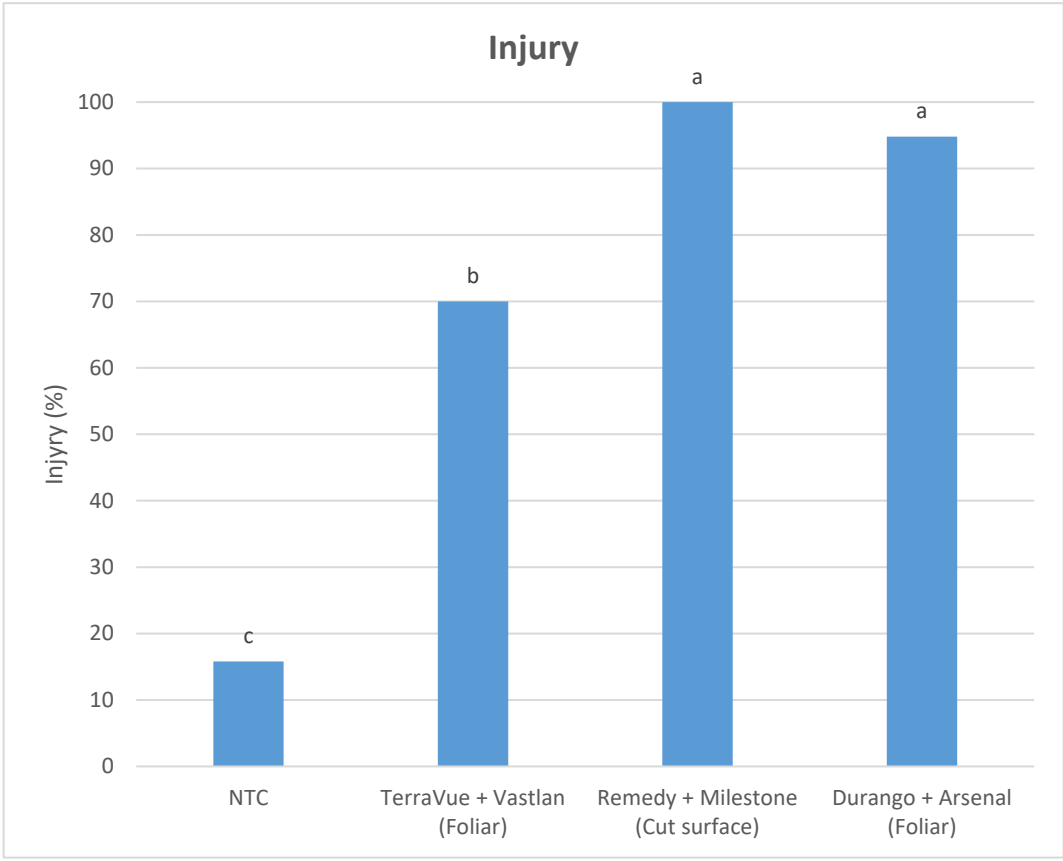
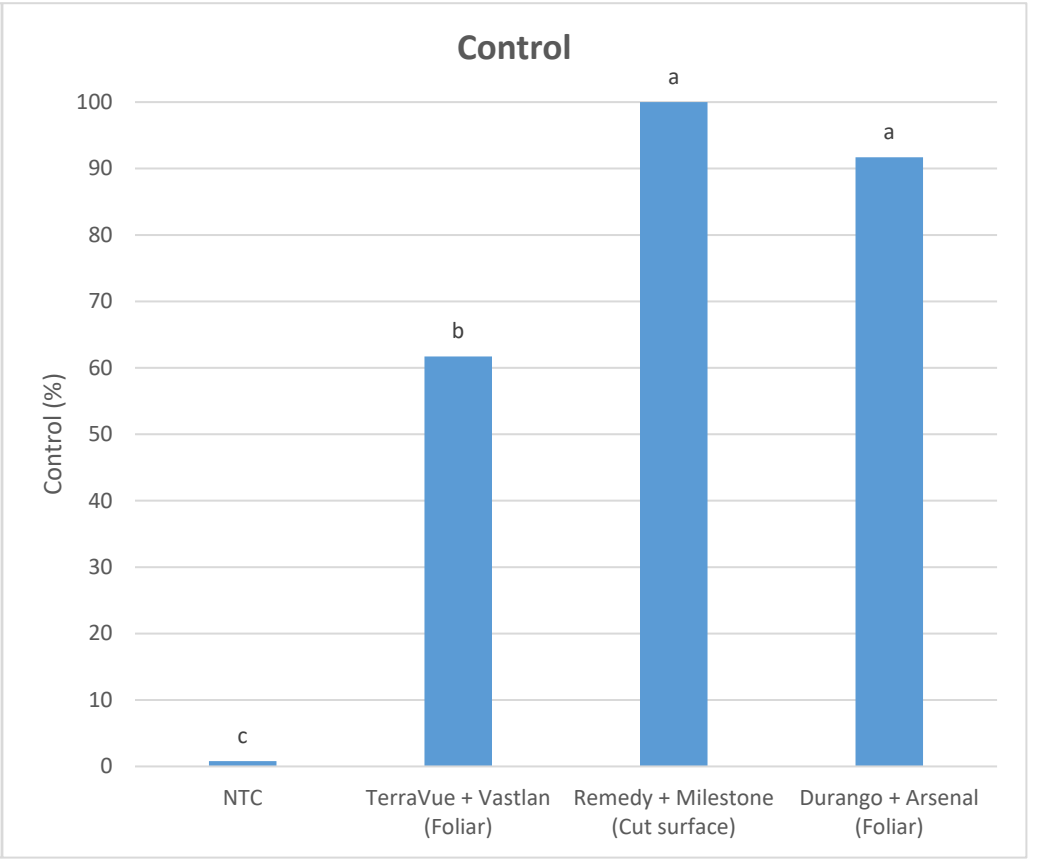
Picture above shows the trial location which was located in a tallgrass prairie infested with bush honeysuckle.

Pictures above show honeysuckle bush before cutting (left) and the stump left after cutting (right).

Results:

Honeysuckle Results – 41 Days after application (September 28, 2023)





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

41 Days After Treatment (DAT) – September 28, 2023								
Trt. No.	**Treatment**	**Rate**	**Application Method**	**Honeysuckle Injury (%)**	**Honeysuckle Control (%)**	**Grass Injury Basal-Drip (%)**	**Grass Injury Drip – 3ft (%)**	**Grass Injury 3 – 6 feet (%)**
1	Nontreated Control (NTC)	-	-	15.8 c	0.8 c	0 b	0 b	0 -
2	TerraVue Vastlan Methylated Seed Oil (MSO)	0.18 oz/gal 2% v/v 0.5% v/v	A	70 b	68 b	1.7 b	0 b	0 -
3	Remedy Ultra Milestone Aqumix Basal Oil	20% v/v 1% v/v 79% v/v	B	100 a	100 a	1.7 b	0 b	0 -
4	Durango Arsenal MSO	4% v/v 0.5% v/v 0.5% v/v	A	94.8 a	91.7 a	58 a	8.8 a	0 -
Statistics[1]								
Least Significant Difference (LSD) P=.05				17.78	15.44	15.25	6.45	.
Standard Deviation				11.12	9.66	9.35	3.95	0.00
Coefficient of Variation (CV)				15.88	15.07	57.27	169.41	0.0
Treatment Prob(F)				0.0001	0.0001	0.0001	0.0340	1.0000

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.