UW – Madison Weed Science Renz Lab

Evaluation of golden creeper (*Thladiantha dubia*) management methods: Fall experiment

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Objective:

Golden creeper has been present in Wisconsin for years but remains an understudied and aggressive pest in natural areas and agronomic settings. We seek to understand which herbicides provide effective control of golden creeper when applied to foliage in the fall.

Summary:

Applications of Escort and Garlon 4 when sprayed in the fall provided acceptable levels of golden creeper control (≥90%) in the year following herbicide treatment at 339 Days After Treatment (DAT). Applications of Roundup PowerMax at the high rate provided lower levels of golden creeper control (44%). Other herbicide treatments including Roundup PowerMax at the low rate, Arsenal, Method 240SL, and Milestone all provided variable levels of control (58-63%).

While results suggest that Garlon 4 and Escort are effective when applied prior to golden creeper senescence in the fall, more research is needed to validate results. Greenhouse studies have suggested that Arsenal is effective at controlling golden creeper, therefore additional field research should confirm its level of efficacy. Additionally, a range of Garlon 4 and Escort rates can be trialed to confirm initial results on the level of control provided by Garlon 4 and Escort.

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Notes

- Treatments were applied using a CO_2 pressurized backpack sprayer to a golden creeper infestation growing on a fenceline adjacent to an annual row crop field (see site photo at right).
- Treatments applied to only one side of fenceline (road side), resulting in vegetative spread into research plots from non-treated side (crop field side), introducing variability into results
  - Results analyzed at P=0.10 instead of P=0.05 due to high amounts of variability in data
- Landowner mowed right-of-way to residual height of 6 inches once in fall of 2019 and once in spring, summer, and fall of 2020 to provide fenceline access

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Herbicide Treatments		
Treatment Number	**Treatment**	**Rate**
1	Untreated Control (UTC)	-
2	Roundup PowerMax Non-ionic Surfactant (NIS) Ammonium Sulfate (AMS)	2% volume/volume (v/v) 0.25% v/v 8.5 pounds per 100 gallons (lb/100 gal)
3	Roundup PowerMax NIS AMS	3% v/v 0.25% v/v 8.5 lb/100 gal
4	Arsenal NIS	0.5% v/v 0.25% v/v
5	Escort NIS	1 gram per gallon (g/gal) 0.25% v/v
6	Garlon 4 Methylated Seed Oil (MSO)	1% v/v 1% v/v
7	Method 240SL MSO	0.5% v/v 1% v/v
8	Milestone MSO	0.33% v/v 1% v/v

Herbicide Application	
Date	October 7th, 2019, 12:30pm – 1:15pm
Equipment	single nozzle backpack sprayer (50 GPA)
Nozzles & spacing	1 flat tip XR TeeJet XR8005

Weather Data	
Weather Station	KWIBLOOM11
Temperature	62°F - 62°F
Wind Speed and Direction	6 mph – 12 mph
Relative Humidity	40% - 43%
Cloud Cover	10%
Previous Rain Event Within 48 Hours	October 5th, 2019 – 1.19 inches
When ≥ 0.25 inches of precipitation occurred after treatment	October 21st, 2019 – 0.94 inches

Research Plot Information	
Plot Dimensions	10 feet by 10 feet
Design	Randomized Complete Block, 4 blocks
Soil Type	Dorerton, very stony-Elbaville complex
Soil Characteristics	14.3% clay, 0.5% organic matter, 7.3 pH, 30% slope

Plants Present at Application – Developmental Stage	
Species	**Average Height (in)**
giant ragweed (*Ambrosia trifida*)	24
golden creeper (*Thladiantha dubia*)	**48 – vines are vegetative and not yet senesced**
wild parsnip (*Pastinaca sativa*)	24

Index of Ratings and Results

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Results:

0 DAT (pre-treatment rating) – October 7th, 2019						
Trt. No.	**Treatment**	**Rate**	**golden creeper cover (%)**	**other broadleaves cover (%)**	**grass cover (%)**	**litter & fence gaps cover (%)**
1	UTC	-	14 -	38 -	0.3 -	48 -
2	Roundup PowerMax NIS AMS	2% v/v 0.25% v/v 8.5 lb/100 gal	20 -	28 -	0.0 -	51 -
3	Roundup PowerMax NIS AMS	3% v/v 0.25% v/v 8.5 lb/100 gal	24 -	18 -	0.0 -	57 -
4	Arsenal NIS	0.5% v/v 0.25% v/v	18 -	10 -	0.0 -	72 -
5	Escort NIS	1 g/gal 0.25% v/v	44 -	24 -	0.0 -	32 -
6	Garlon 4 MSO	1% v/v 1% v/v	32 -	24 -	0.0 -	44 -
7	Method 240SL MSO	0.5% v/v 1% v/v	25 -	42 -	0.0 -	32 -
8	Milestone MSO	0.33% v/v 1% v/v	32 -	34 -	0.5 -	34 -
Statistics[1]						
Least Significant Difference (LSD) P=.10			27.14	25.38	0.45	20.62
Standard Deviation			22.30	20.86	0.37	16.94
Coefficient of Variation (CV)			85.47	76.28	396.81	36.46
Treatment Prob(F)			0.6312	0.4462	0.4586	0.0348

Note: Means followed by same letter or symbol do not significantly differ (P=.10[2], LSD).

[1] All statistical analyses were conducted in ARM software and assumptions of ANOVA were not evaluated.
[2] Significance level of P=0.10 instead of P=0.05 used due to high levels of data variability (see notes section)

339 DAT – September 10th, 2020			
Trt. No.	**Treatment**	**Rate**	**golden creeper cover (%)**
1	UTC	-	0 c
2	Roundup PowerMax NIS AMS	2% v/v 0.25% v/v 8.5 lb/100 gal	58 ab
3	Roundup PowerMax NIS AMS	3% v/v 0.25% v/v 8.5 lb/100 gal	44 b
4	Arsenal NIS	0.5% v/v 0.25% v/v	58 ab
5	Escort NIS	1 g/gal 0.25% v/v	91 a
6	Garlon 4 MSO	1% v/v 1% v/v	90 a
7	Method 240SL MSO	0.5% v/v 1% v/v	64 ab
8	Milestone MSO	0.33% v/v 1% v/v	60 ab
Statistics			
LSD P=.10			31.851
Standard Deviation			24.852
CV			41.3
Treatment Prob(F)			0.0621

Note: Means followed by same letter or symbol do not significantly differ (P=.10, LSD).