

UW – Madison Weed Science Renz Lab

Evaluation of golden creeper (*Thladiantha dubia*) control methods in a greenhouse setting

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Objective:

Determine the effectiveness of Roundup PowerMax (glyphosate), Arsenal (imazapyr), and Escort XP (metsulfuron) when applied to golden creeper to inform herbicide applications in field experiments.

Summary:

Metsulfuron (3 oz/A) and imazapyr (32 fl oz/A) resulted in 100% necrosis of golden creeper at 59 Days After Treatment (DAT) and prevented resprouting of golden creeper tubers at 118 DAT. Glyphosate and imazapyr (16 fl oz/A) resulted in low levels of necrosis (26 - 38%) at 59 DAT with poor control (31 - 64%) and some resprouting occurring at 118 DAT. Results suggest that treatments with metsulfuron and imazapyr will provide superior control compared to glyphosate and should be included in field trials. Note auxinic herbicides (e.g. 2,4-D, Milestone, Transline, Vastlan) were not included as they cannot be sprayed in greenhouses. These products still require evaluation.

Research Plot Information:

Plot Dimensions: Single-plant pots as plots (1-gallon pots)

Design: Randomized Complete Block, 7 blocks

Soil Type: Artificial media: 40% sand, 40% autoclaved compost, 20% ProMix BX

Notes:

Golden creeper tubers harvested from a wild population in Grant County, Wisconsin in fall of 2018, then cultivated in a greenhouse during winter of 2018-19. Herbicide treatments made with a spray chamber and symptoms evaluated in a greenhouse.

Herbicide Treatments:

Treatment Number	Treatment	Rate
1	Roundup Powermax Induce	1.5 lb acid equivalent/acre (AE/A) 0.50% volume/volume (v/v)
2	Arsenal Powerline Induce	16 ounces per acre (oz/A) 0.25% v/v
3	Arsenal Powerline Induce	32 ounces per acre (oz/A) 0.25% v/v
4	Escort XP Induce	3 oz/A 0.25% v/v

Herbicide Application:

Date: April 30th, 2019, 1:00pm – 3:30pm

Equipment: Spray chamber calibrated to deliver 20 gallons per acre

Nozzles: One (1) Flat Tip EVS Teejet 8002

Manchu Tubergourd Phenology: plants vegetative, height ranged from 28 – 60 inches

Index of Ratings and Results

22 DAT - May 22nd, 2019	3
59 DAT – June 28th, 2019	4
118 DAT – August 26th, 2019.....	5



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Results:

22 DAT - May 22nd, 2019

Trt. No.	Treatment	Rate	Goldencreeper Chlorosis (%)	Goldencreeper Necrosis (%)
1	Roundup Powermax Induce	1.5 lb AE/A 0.50% v/v	5.7 b	1.7 -
2	Arsenal Powerline Induce	16 oz/A 0.25% v/v	5.1 b	0.9 -
3	Arsenal Powerline Induce	32 oz/A 0.25% v/v	14.7 b	10.3 -
4	Escort XP Induce	3 oz/A 0.25% v/v	33.1 a	25.7 -
Statistics¹				
Least Significant Difference (LSD) P=.05			17.82	18.5
Standard Deviation			15.86	16.47
Coefficient of Variation (CV)			108.08	170.84
Treatment Prob(F)			0.0131	0.0393

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

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



59 DAT – June 28th, 2019

Trt. No.	Treatment	Rate	Golden Creeper Chlorosis (%)	Golden Creeper Necrosis (%)
1	Roundup Powermax Induce	1.5 lb AE/A 0.50% v/v	14.6 b	37.9 b
2	Arsenal Powerline Induce	16 oz/A 0.25% v/v	31.4 a	25.7 b
3	Arsenal Powerline Induce	32 oz/A 0.25% v/v	0.0 b	100.0 a
4	Escort XP Induce	3 oz/A 0.25% v/v	0.0 b	100.0 a
Statistics				
LSD P=.05			16.66	23.29
Standard Deviation			14.84	20.74
CV			129.03	31.48
Treatment Prob(F)			0.0024	0.0001

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

118 DAT – August 26th, 2019.

Trt. No.	Treatment	Rate	Golden Creeper Resprouts (#)	Golden Creeper True Leaves (#)	Golden Creeper Control (%)
1	Roundup Powermax Induce	1.5 lb AE/A 0.50% v/v	1.7 a	8.3 a	31.4 b
2	Arsenal Powerline Induce	16 oz/A 0.25% v/v	0.7 ab	1.7 b	64.3 ab
3	Arsenal Powerline Induce	32 oz/A 0.25% v/v	0.0 b	0.0 b	100.0 a
4	Escort XP Induce	3 oz/A 0.25% v/v	0.0 b	0.0 b	100.0 a
Statistics					
LSD P=.05			1.04	4.73	40.29
Standard Deviation			0.93	4.21	35.87
CV			152.49	168.35	48.52
Treatment Prob(F)			0.0081	0.0046	0.0054

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