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COLLEGE OF AGRICULTURAL & LIFE SCIENCES
UNIVERSITY OF WISCONSIN-MADISON

Extension
UNIVERSITY OF WISCONSIN-MADISON

ID #19-1

UW – Madison Weed Science Renz Lab

Can Esplanade Effectively Suppress Germination of Garlic Mustard (*Alliaria petiolata*)?

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Objective:

Evaluate the ability of Esplanade (indaziflam) to suppress germination of garlic mustard when included in a tank mix with Roundup PowerMax (glyphosate) for control of emerged garlic mustard rosettes. Determine whether this tank mixture provides year-round control of garlic mustard.

Summary:

Although Roundup PowerMax controlled emerged garlic mustard (93-95%), later germinating plants avoided control and resulted in 8% cover at 180 days after treatment (DAT). Treatments including Esplanade failed to control seedling emergence, as the cover and number of spring emerging garlic mustard rosettes observed at 180 DAT were similar to Roundup PowerMax only treatments. Results suggest that Esplanade applied in the spring with glyphosate does not give season long control of garlic mustard. Application timing (spring) may be a reason for poor results as others have suggested it takes time for the herbicide to become active in the soil and provide residual control. Applications in the fall are recommended by Bayer, and others have found Esplanade to be effective at controlling garlic mustard. Research should continue to explore how to integrate this tool into garlic mustard control.

Research Plot Information:

Plot Dimensions: 10 feet by 20 feet

Design: Randomized Complete Block, 3 blocks

Soil Type: 65% Kidder loam 6 – 12% slope, 35% St. Charles silt loam 2 – 6% slope

Herbicide Treatments:

Treatment Number	Treatment	Rate
1	Esplanade Roundup PowerMax Ammonium Sulfate	2 ounces per acre (oz/a) 29 fluid ounces per acre (fl oz/a) 15 pounds per 100 gallons (lb/100 gal)
2	Esplanade Roundup PowerMax Ammonium Sulfate	5 oz/a 29 fl oz/a 15 lb/100 gal
3	Roundup PowerMax Ammonium Sulfate	29 fl oz/a 15 lb/100 gal

Herbicide Application:

Date: April 5th, 2019, 2:00pm – 2:30pm

Equipment: Backpack sprayer (20 GPA) with 10-foot boom

Nozzles: Eight (8) Flat Tip XR TeeJet 11002 VS on 15-inch nozzle spacing

Regulator PSI: 38

Boom PSI: 26

Plants Present/Stage of Development:

April 8th, 2019:

- Garlic mustard (*Alliaria petiolata)* rosettes green, flush of seedlings already emerged (cotyledons only)
- Violet species (*Viola* sp.) Emerging, 1/2 inch tall
- Currant species (*Ribes* sp.) Budding out
- Honeysuckle (*Lonicera* sp.) Budding out
- Raspberry species (*Rubus sp.)* Budding out
- Reed canarygrass (*Phalaris arundinacea)* emerging, 1 inch tall
- Dame's rocket (*Hesperis matronalis)* rosettes greened up

Weather Data:

Weather Station	KWIMADIS196
Temperature	58°F
Wind Speed and Direction	2.5mph WSW
Relative Humidity	77%
Cloud Cover	60%
Previous Rain Event Within 48 Hours	-
When ≥ 0.25 inches of precipitation occurred after treatment	April 7th, 2019 – 0.28 inches

Index of Ratings and Results

Results:

12 DAT – April 17th, 2019

Trt. No.	Treatment	Rate	Garlic mustard control (%)
1	Esplanade Roundup PowerMax Ammonium Sulfate	2 oz/a 29 fl oz/a 15 lb/100 gal	75.0 -
2	Esplanade Roundup PowerMax Ammonium Sulfate	5 oz/a 29 fl oz/a 15 lb/100 gal	78.3 -
3	Roundup PowerMax Ammonium Sulfate	29 fl oz/a 15 lb/100 gal	65.0 -
Statistics[1]			
Least Significant Difference (LSD) P=.05			12.81
Standard Deviation			5.56
Coefficient of Variation (CV)			7.77
Treatment Prob(F)			0.0940

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.

18 DAT – April 23th, 2019

Trt. No.	Treatment	Rate	Garlic mustard control (%)
1	Esplanade Roundup PowerMax Ammonium Sulfate	2 oz/a 29 fl oz/a 15 lb/100 gal	93.3 -
2	Esplanade Roundup PowerMax Ammonium Sulfate	5 oz/a 29 fl oz/a 15 lb/100 gal	93.7 -
3	Roundup PowerMax Ammonium Sulfate	29 fl oz/a 15 lb/100 gal	95.3 -
Statistics			
Least Significant Difference (LSD) P=.05			12.30
Standard Deviation			5.43
Coefficient of Variation (CV)			5.77
Treatment Prob(F)			0.8925

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

42 DAT – April 23th, 2019

Trt. No.	Treatment	Rate	Garlic mustard Cover (%)	Broadleaf Cover (%)	Shrub Cover (%)	Bareground Cover (%)
1	Esplanade Roundup PowerMax Ammonium Sulfate	2 oz/a 29 fl oz/a 15 lb/100 gal	2.3 -	56.7 -	1.0 -	40.0 -
2	Esplanade Roundup PowerMax Ammonium Sulfate	5 oz/a 29 fl oz/a 15 lb/100 gal	1.7 -	63.3 -	2.0 -	33.3 -
3	Roundup PowerMax Ammonium Sulfate	29 fl oz/a 15 lb/100 gal	1.7 -	65.0 -	1.7 -	31.7 -
Statistics						
LSD P=.05			1.51	61.21	5.45	64.84
Standard Deviation			0.67	27.00	2.40	28.60
CV			35.29	43.79	154.52	81.72
Treatment Prob(F)			0.4444	0.9246	0.8779	0.9323

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

180 DAT – October 2nd, 2019

Trt. No.	Treatment	Rate	Garlic mustard rosette count (#/plot)	Garlic mustard Cover (%)
1	Esplanade Roundup PowerMax Ammonium Sulfate	2 oz/a 29 fl oz/a 15 lb/100 gal	31 -	8.0 -
2	Esplanade Roundup PowerMax Ammonium Sulfate	5 oz/a 29 fl oz/a 15 lb/100 gal	33 -	7.3 -
3	Roundup PowerMax Ammonium Sulfate	29 fl oz/a 15 lb/100 gal	34 -	7.7 -
Statistics				
LSD P=.05			58.63	13.09
Standard Deviation			25.86	5.77
CV			78.37	75.31
Treatment Prob(F)			0.9877	0.9901

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

362 DAT – April 1st, 2020

Trt. No.	Treatment	Rate	Garlic mustard rosette count (#/plot)	Seedling Count (#/m²)
1	Esplanade Roundup PowerMax Ammonium Sulfate	2 oz/a 29 fl oz/a 15 lb/100 gal	86 -	496 -
2	Esplanade Roundup PowerMax Ammonium Sulfate	5 oz/a 29 fl oz/a 15 lb/100 gal	66 -	433 -
3	Roundup PowerMax Ammonium Sulfate	29 fl oz/a 15 lb/100 gal	63 -	480 -
Statistics				
LSD P=.05			76.41	489.16
Standard Deviation			33.71	53.95
CV			46.82	45.89
Treatment Prob(F)			0.6854	0.9334

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