UW – Madison Weed Science Renz Lab

Burning bush (*Euonymus alatus*) management with Method (aminocyclopyrachlor)

Dr. Mark Renz, Professor and Extension Weed Specialist

mrenz@wisc.edu – 357 Moore Hall, 1575 Linden Drive, Madison, WI, 53706

Leo Roth, Research Specialist

nlroth2@wisc.edu – 236 Moore Hall, 1575 Linden Drive, Madison, WI, 53706

Objective:

Determine the efficacy of Method as a foliar application for control of burning bush as compared to established standards.

Summary:

At 2 weeks after treatment (WAT), only Garlon 3A showed any herbicide symptomology (6-14% leaf necrosis, 43-48% leaf drop). All treatments containing Garlon 3A and Method showed some evidence of off-target injury from root uptake but were within 3 meters of the treated plant.

At 3 months after treatment (MAT), Garlon 3A treatments dropped more leaves (70-88% leaf drop) than Method or Milestone treatments and the untreated control (0-12% leaf drop). However, all rates of Method resulted in more leaf chlorosis (22-50%) than the untreated control (0%). Off-target injury was not evaluated at this time.

One and 1.5 years after treatment, control of burning bush was sub-optimal as no treatment gave > 80% control. Method (0.375% v/v) gave the best control (77%) but was similar to Garlon 3A at 3% 425 DAT.

Burning bush was not controlled to an acceptable level with foliar applications of Method, Garlon or Milestone. Size of plants, or weather don’t appear to be confounding factors in these results. Other foliar herbicides (e.g. metsulfuron, glyphosate, imazapyr) should be evaluated as well as alternative chemical (cut- surface, basal bark) and non-chemical approaches (goats, plant removal).

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Herbicide Treatments		
Treatment Number	Treatment	Rate
1	Untreated Control (UTC)	-
2	Method 240SL	0.25% volume/volume (v/v)
3	Method 240SL	0.375% v/v
4	Method 240SL	0.50% v/v
5	Milestone	0.33% v/v
6	Garlon 3A	3% v/v
7	Garlon 3A	1.5% v/v

Note: All treatments contain 1% methylated seed oil (MSO) at 1% volume by volume

Herbicide Application	
Date	July 1st, 2020, 12:15pm – 2:00pm
Equipment	CO_2 pressurized single nozzle sprayer (50 GPA)
Nozzles & spacing	One TeeJet flat fan even 8002E nozzle
Regulator PSI	42

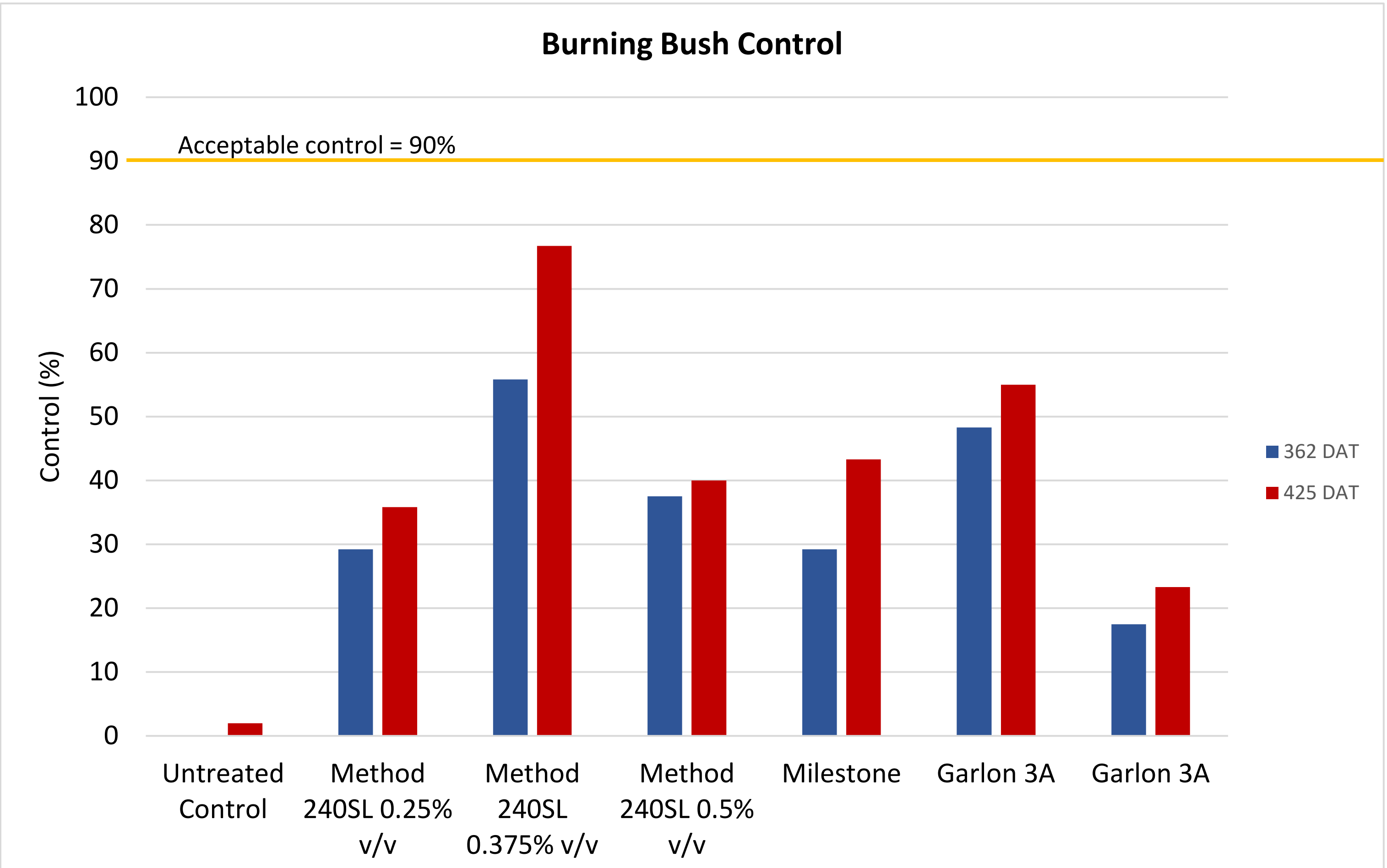
Weather Data	
Weather Station	KWIVERON41
Temperature	84°F - 86°F
Wind Speed and Direction	6.4 mph – 7.2 mph
Relative Humidity	58% - 65%
Cloud Cover	33%
Previous Rain Event Within 48 Hours	June 29th, 2020, 3:00pm – 0.98 inches
When $\geq$ 0.25 inches of precipitation occurred after treatment	July 7th, 2020 – 0.39 inches

Research Plot Information	
Plot Dimensions	single shrub
Design	Randomized Complete Block, 6 blocks
Soil Type	Gale silt loam
Soil Characteristics	18.5% clay, 0.4% organic matter, 5.8 pH, 9% slope

Example of high chlorosis treatment at 90 DAT
(Trt 4 – Method @ 0.5% v/v)
Note presence of both healthy and chlorotic leaf tissue

Example of high leaf drop treatment at 90 DAT
(Trt 6 – Garlon 3A @ 3% v/v)

Index of Ratings and Results


Burning Bush Control
Acceptable control = 90%
Control (%)
100
90
80
70
60
50
40
30
20
10
0
Untreated Control
Method 240SL 0.25% v/v
Method 240SL 0.375% v/v
Method 240SL 0.5% v/v
Milestone
Garlon 3A
Garlon 3A
362 DAT
425 DAT

Results:

19 Days After Treatment (DAT) – July 20th, 2020

Trt. No.	Treatment	Rate	burning bush leaf necrosis (%)	burning bush leaf drop (%)	root uptake injury (0-1)[1]	root uptake injury distance (m)
1	UTC	-	0 b	0 b	0 -	0 -
2	Method 240SL	0.25% v/v	0 b	0 b	0.2 -	2 -
3	Method 240SL	0.375% v/v	0 b	0 b	0.2 -	2 -
4	Method 240SL	0.50% v/v	0 b	0 b	0.5 -	2 -
5	Milestone	0.33% v/v	0 b	0 b	0 -	0 -
6	Garlon 3A	3% v/v	14 a	43 a	0.2 -	2 -
7	Garlon 3A	1.5% v/v	6 b	48 a	0.5 -	2 -
Statistics[2]						
Least Significant Difference (LSD) P=.05			6.41	9.07	0.47	.
Standard Deviation			5.43	7.69	0.4	.
Coefficient of Variation (CV)			184.03	58.76	184.99	.
Treatment Prob(F)			0.0003	0.0001	0.1637	.

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

90 DAT – September 29th, 2020

Trt. No.	Treatment	Rate	burning bush leaf necrosis (%)	burning bush chlorosis (%)	burning bush leaf drop (%)
1	UTC	-	0.6 -	0.8 d	12 b
2	Method 240SL	0.25% v/v	0 -	22 bc	0.8 b
3	Method 240SL	0.375% v/v	0.3 -	50 a	0.2 b
4	Method 240SL	0.50% v/v	0 -	35 ab	0 b
5	Milestone	0.33% v/v	0.8 -	7 cd	3 b
6	Garlon 3A	3% v/v	0.7 -	3 cd	88 a
7	Garlon 3A	1.5% v/v	0.3 -	2 cd	70 a
Statistics					
LSD P=.05			1.07	19.88	18.79
Standard Deviation			0.91	16.83	15.91
CV			232.32	95.72	63.21
Treatment Prob(F)			0.6108	0.0001	0.0001

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

[1] 1 = off-target injury observed, 0 = **no** off-target injury observed
[2] All statistical analyses were conducted in ARM software and assumptions of ANOVA were not evaluated.

362 DAT – June 28th, 2021			
Trt. No.	**Treatment**	**Rate**	**Burning Bush Control (%)**
1	UTC	-	0 d
2	Method 240SL	0.25% v/v	29 bc
3	Method 240SL	0.375% v/v	56 a
4	Method 240SL	0.50% v/v	38 abc
5	Milestone	0.33% v/v	29 bc
6	Garlon 3A	3% v/v	48 ab
7	Garlon 3A	1.5% v/v	18 cd
Statistics			
LSD P=0.05			25
Standard Deviation			21.17
CV			66.51
Treatment Prob(F)			0.0031

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

425 DAT – September 7th, 2021				
Trt. No.	**Treatment**	**Rate**	**Burning Bush DBH (cm)**	**Burning Bush Control (%)**
1	UTC	-	2.6-	2 d
2	Method 240SL	0.25% v/v	2.3-	36 bc
3	Method 240SL	0.375% v/v	1.9-	77 a
4	Method 240SL	0.50% v/v	2.6-	40 bc
5	Milestone	0.33% v/v	2.4-	43 bc
6	Garlon 3A	3% v/v	1.8-	55 ab
7	Garlon 3A	1.5% v/v	2.2-	23 cd
Statistics				
LSD P=0.05			0.989	22.3
Standard Deviation			0.838	18.88
CV			37.13	46.78
Treatment Prob(F)			0.6009	0.0001

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