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UNIVERSITY OF WISCONSIN-MADISON

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UW – Madison Weed Science Renz Lab

Can Fluazifop-P-Butyl Effectively Control Phragmites (*Phragmites australis*)?

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Objective:

Determine the efficacy of fluazifop-P-butyl (fluazifop, A12460A) applications to Phragmites as compared to glyphosate applications.

Summary:

At 56 days after summer application, we observed no reductions in phragmites cover. Both glyphosate and the high rate of fluazifop showed elevated levels of injury to phragmites.

In the year following application (356 days after the summer application, 300 days after the fall application), several treatments provided similar control to the standard glyphosate treatment (94-96% control). These treatments included 3% volume by volume (v/v) of fluazifop at summer and fall application timings (88% control), in addition to the 2% and 3% v/v rate of fluazifop in the fall (84% control).

Fluazifop at 2-3% v/v would be of benefit to areas where tolerant desirable broadleaf plants are present. In these areas, standard treatments (glyphosate, imazapyr) also control broadleaf plants, necessitating revegetation following treatment. However, use sites for fluazifop will be limited, as the herbicide is not labelled for use where standing water is present, restricting use to upland populations of phragmites. Because 1 year after fall treatment evaluations could not be completed, it is not clear if long-term control of phragmites with fluazifop will be similar to glyphosate or imazapyr.

Research Plot Information:

Plot Dimensions: 10 feet by 10 feet

Design: Randomized Complete Block, 4 blocks

Soil Type: 100% Houghton muck, 0 – 2 percent slopes

Notes:

- A later application for treatment 9 was not applied; it was scheduled for two weeks after the fall application, and not enough time remained in growing season prior to phragmites senescence
- Treatments 2 and 8 were applied at ½ the spray volume of all other treatments
- 1 year after treatment evaluations were not completed for fall application timing as research plots were accidentally mowed, making evaluations impossible

Herbicide Treatments:

Treatment Number	Treatment	Application Timing	Spray Volume	Rate
1	Untreated Control (UTC)	-	-	-
2	A12460A	summer	25 GPA	2 % volume/volume (v/v)
3	A12460A A12460A	summer fall	50 GPA	2% v/v 2% v/v
4	A12460A	summer	50 GPA	1% v/v
5	A12460A	summer	50 GPA	2% v/v
6	A12460A	summer	50 GPA	3% v/v
7	Glyphosate	summer	50 GPA	2% v/v
8	A12460A	fall	25 GPA	2% v/v
9	A12460A	fall	50 GPA	2% v/v
10	A12460A	fall	50 GPA	1% v/v
11	A12460A	fall	50 GPA	2% v/v
12	A12460A	fall	50 GPA	3% v/v
13	Glyphosate	fall	50 GPA	2% v/v

Note: all treatments containing A12460A (2-6, 8-12) contain crop oil concentrate at 1% v/v, all treatments containing glyphosate (7 & 13) contain non-ionic surfactant at 0.25% v/v and ammonium sulfate at 8.5 pounds per 100 gallons of spray solution

Herbicide Application

Application Timing	Summer	Fall
Date	July 30th, 2019	September 24th, 2019
Time	10:20am – 12:00pm	10:20am – 11:30am

Equipment: Single-nozzle boom

Nozzles: One (1) Flat Tip XR Teejet XR8005

Boom PSI: 40 PSI

Plants Present/Stage of Development:

- **Summer application**
  - Phragmites 7 – 10 feet tall
  - Vegetative
- **Fall application**
  - Phragmites 7 – 10 feet tall
  - Flowering and/or in seed

Phragmites at fall application

Weather Data:

Weather Station	KWIFITCH12	
Application Timing	**A - Timing**	**B & C - Timing**
Temperature	73°F	71°F
Wind Speed and Direction	0mph	1.3mph WSW
Relative Humidity	21%	26%
Cloud Cover	50%	0%
Previous Rain Event Within 48 Hours	July 29th, 2019 – 0.43 inches	September 22nd, 2019 – 2.86 inches
When ≥ 0.25 inches of precipitation occurred after treatment	August 5th, 2019 – 1.28 inches	September 27th, 2019 – 0.57 inches

Index of Ratings and Results

Results:

3 Days After Summer Application - August 2nd, 2019

Trt. No.	Treatment	Application Timing	Spray Volume	Rate	Phragmites Cover (%)	Cattail Cover (%)	Broadleaf Weed Cover (%)	Reed Canarygrass Cover (%)	Bareground / Standing Water Cover (%)
1	UTC	-			67 -	0 -	3 -	30 -	0 -
2	A12460A	summer	25 GPA	2 % v/v	75 -	1 -	2 -	21 -	0 -
3	A12460A A12460A	summer fall	50 GPA	2% v/v 2% v/v	82 -	0 -	4 -	13 -	0 -
4	A12460A	summer	50 GPA	1% v/v	52 -	0 -	1 -	47 -	0 -
5	A12460A	summer	50 GPA	2% v/v	65 -	0 -	11 -	4 -	0 -
6	A12460A	summer	50 GPA	3% v/v	67 -	0 -	1 -	32 -	0 -
7	Glyphosate	summer	50 GPA	2% v/v	58 -	0 -	2 -	40 -	0 -
8	A12460A	fall	25 GPA	2% v/v	67 -	6 -	19 -	8 -	0 -
9	A12460A	fall	50 GPA	2% v/v	61 -	0 -	4 -	35 -	0 -
10	A12460A	fall	50 GPA	1% v/v	61 -	2 -	5 -	31 -	0 -
11	A12460A	fall	50 GPA	2% v/v	68 -	1 -	4 -	27 -	0 -
12	A12460A	fall	50 GPA	3% v/v	52 -	0 -	2 -	46 -	0 -
13	Glyphosate	fall	50 GPA	2% v/v	69 -	5 -	2 -	24 -	0 -
Statistics[1]									
Least Significant Difference (LSD) P=.05					24.75	6.03	12.58	29.04	.
Standard Deviation					17.26	4.21	8.77	20.25	0
Coefficient of Variation (CV)					26.55	336.65	186.93	69.69	0
Treatment Prob(F)					0.4819	0.4685	0.2406	0.2443	1

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.

56 Days After Summer Application, 0 Days After Fall Application - September 24th, 2019

Trt. No.	Treatment	Applic. Timing	Spray Vol.	Rate	Phragmites Cover (%)	Phragmites Injury (%)	Cattail Cover (%)	Broad leaf Weed Cover (%)	Reed Canary grass Cover (%)	Bareground / Standing Water Cover (%)	Sedge Sp. Cover (%)
1	UTC	-			74 -	41 bc	2 -	2 -	10 -	4 -	6 -
2	A12460A	summer	25 GPA	2 % v/v	79 -	42 bc	1 -	0 -	2 -	14 -	4 -
3	A12460A A12460A	summer fall	50 GPA	2% v/v 2% v/v	81 -	42 bc	1 -	2 -	5 -	8 -	2 -
4	A12460A	summer	50 GPA	1% v/v	57 -	45 bc	0 -	2 -	18 -	22 -	0 -
5	A12460A	summer	50 GPA	2% v/v	83 -	30 c	0 -	2 -	6 -	8 -	0 -
6	A12460A	summer	50 GPA	3% v/v	57 -	60 ab	1 -	0 -	28 -	14 -	0 -
7	Glyphosate	summer	50 GPA	2% v/v	72 -	70 a	0 -	0 -	15 -	13 -	0 -
8	A12460A	fall	25 GPA	2% v/v	64 -	32 c	5 -	18 -	7 -	5 -	0 -
9	A12460A	fall	50 GPA	2% v/v	75 -	30 c	0 -	0 -	18 -	2 -	4 -
10	A12460A	fall	50 GPA	1% v/v	80 -	30 c	6 -	0 -	4 -	9 -	0 -
11	A12460A	fall	50 GPA	2% v/v	88 -	32 c	2 -	0 -	8 -	1 -	0 -
12	A12460A	fall	50 GPA	3% v/v	62 -	42 bc	0 -	0 -	26 -	12 -	0 -
13	Glyphosate	fall	50 GPA	2% v/v	68 -	44 bc	2 -	0 -	14 -	15 -	0 -
Statistics											
LSD P=.05					22.39	22.32	5.77	21.47	13.6	14.28	6.05
Standard Deviation					15.61	15.56	4.02	14.97	9.48	9.96	4.22
CV					21.56	37.25	232.45	121.6	414.37	99.58	332.38
Treatment Prob(F)					0.1168	0.0195	0.4685	0.276	0.4214	0.2424	0.4816

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

356 Days After Summer Application, 300 Days After Fall Application – July 21st, 2020

Trt. No.	Treatment	Applic. Timing	Spray Vol.	Rate	Phragmites Cover (%)	Phragmites Control (%)	Cattail Cover (%)	Reed Canary grass Cover (%)	Bareground / Standing Water Cover (%)	Sedge Sp. Cover (%)
1	UTC	-			29 ab	0 e	4 -	13 -	12 -	36 -
2	A12460A	summer	25 GPA	2 % v/v	31 a	56 d	2 -	42 -	4 -	56 -
3	A12460A A12460A	summer fall	50 GPA	2% v/v 2% v/v	24 a-d	68 cd	0 -	54 -	2 -	38 -
4	A12460A	summer	50 GPA	1% v/v	28 ab	54 d	0 -	48 -	0 -	18 -
5	A12460A	summer	50 GPA	2% v/v	22 a-e	68 cd	0 -	30 -	0 -	30 -
6	A12460A	summer	50 GPA	3% v/v	8 c-f	88 abc	6 -	61 -	0 -	14 -
7	Glyphosate	summer	50 GPA	2% v/v	2 f	96 a	5 -	48 -	0 -	28 -
8	A12460A	fall	25 GPA	2% v/v	20 a-f	70 bcd	2 -	47 -	0 -	25 -
9	A12460A	fall	50 GPA	2% v/v	19 a-f	68 cd	1 -	47 -	4 -	38 -
10	A12460A	fall	50 GPA	1% v/v	28 abc	56 d	0 -	37 -	0 -	46 -
11	A12460A	fall	50 GPA	2% v/v	11 b-f	84 abc	8 -	48 -	13 -	28 -
12	A12460A	fall	50 GPA	3% v/v	8 def	88 abc	5 -	60 -	0 -	28 -
13	Glyphosate	fall	50 GPA	2% v/v	4 ef	94 ab	2 -	27 -	0 -	20 -
Statistics										
LSD P=.05					18.89	23.735	9.22	32.79	13.37	27.11
Standard Deviation					13.17	16.551	6.43	22.87	9.32	18.91
CV					72.34	24.04	221.39	52.8	339.06	60.2
Treatment Prob(F)					0.0198	0.0001	0.6791	0.2043	0.4462	0.1719

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