

2018 Poison Hemlock Control Trial near Richmond (including 2019 Assessment)

Introduction

Poison hemlock (*Conium maculatum*) is classified as a biennial species that is potentially toxic, and listed as a noxious weed. It is a common problem on Kentucky right-of-ways. Infestations occur along roadsides, field margins, ditches, marshes, meadows, and low-lying areas, but this plant prefers shaded areas with moist soil. It can grow up to ten feet tall. The stems are ribbed and hollow with purplish streaks or splotches, which are characteristics for identification. Poison hemlock reproduces by seeds that fall near the plant and disperse via fur, birds, water, and, to a limited extent, wind. Most seeds fall from September through December, but they can fall as late as the end of February. The seeds typically germinate in the fall or late winter, but the plant usually does not bolt and produce flowers until the following spring, which is when they are most noticeable. The objective of this study was to evaluate herbicide control options including new formulations of 2,4-D, considered to have a lower volatility potential (i.e. Freelexx) and the new formulation of triclopyr (i.e. Vastlan).

Materials and Methods

The trial was established May 7, 2018 on an area mowed once a year along I-75 near Richmond, KY with a thick stand of poison hemlock. The trial consisted of 9 treatments with 3 replications arranged in a randomized complete block design with 7 ft by 25 ft plots. Applications were made using a spray carrier volume of 20 gallons per acre. Poison hemlock plants had bolted (32 to 48 inches tall) but not yet flowered at time of application. Canada thistle plants (average of 24 inches tall) and common teasel plants (average of 12 inches tall) were also present in most plots at application. Plots were assessed 9 days after treatment (DAT) (5/16/2018), 52 DAT (6/28/2018), and 374 DAT (5/16/2019). It was not possible to assess treatments later in the season as giant foxtail covered the treated plot area. Vetch also covered the control plot areas. Data were analyzed using ARM research management software (GDM Solutions, Inc.) and treatment means were compared using Fisher's LSD at $p = 0.05$.

Results and Discussion

All herbicide treatments (Table 1) had an effect on the poison hemlock plants (Figure 1) 9 DAT. There were no differences in control between the DMA 4 and Freelexx 2,4-D formulations 9 or 52 DAT (Table 2). However, the older Garlon 3A was slower (33% control) than Vastlan (50% control) 9 DAT but had the same control at 52 DAT (97 to 98% control). Most poison hemlock plants were brown and dry 52 DAT but some green tissue still remained. Visual control was lower for the Milestone and Opensight than the other treatments. Method provided the best control (55%) on common teasel 9 DAT but it was not possible to evaluate common teasel on the

second rating date. The best early control ratings 9 DAT on Canada thistle (50 to 63% control) were with DMA 4, Milestone, Solution Water Soluble, and Opensight.

In 2019 an early spring assessment for the amount of aboveground vegetation for these three species was conducted (Table 3). Although the plant distribution had been variable in 2018, we hoped to distinguish patterns attributable to extended control in 2019 with soil residual herbicides, like Milestone, Method, and Opensight. However, there was considerable variability among plots (Table 3). Furthermore, at 374 DAT no teasel plants were observed within plots treated with Method.

A number of effective herbicide control options are available for poison hemlock. The new formulations of 2,4-D and triclopyr resulted in similar levels of control compared to the older formulations.

Non-Crop and Invasive Vegetation Management Weed Science
2019 Annual Research Report

Table 1. Herbicide Treatments, Active Ingredients and Application Rates.

Trt. No.	Product Name	Rate	Rate Unit	Active Ingredient(s)	ai Rate (per acre)
1	DMA 4 IVM	4	PT/A	2,4-D [dimethylamine salt]	1.9 lb ae
2	Freelexx	4	PT/A	2,4-D [choline salt]	1.9 lb ae
3	Milestone	5	FL OZ/A	aminopyralid	1.25 oz ae
4	Method	15	FL OZ/A	aminocyclopyrachlor	3.75 oz ae
5	Solution Water Soluble	2.28	LB/A	2,4-D [dimethylamine salt]	1.84 lb ae
6	Garlon 3A	1.5	QT/A	Triclopyr [triethylamine salt]	18 oz ae
7	Vastlan	1.1	QT/A	Triclopyr [choline salt]	18 oz ae
8	Opensight	2.5	OZ/A	aminopyralid + metsulfuron	1.31 oz ae + 0.24 oz
9	Nontreated Check				

All herbicide treatments contained the adjuvant, Activator 90 at 0.25% v/v.

Non-Crop and Invasive Vegetation Management Weed Science
2019 Annual Research Report

Table 2. Herbicide Treatments, Application Rates, and Visual Data²

Trt. No.	Product Name	Rate	Rate Unit	Poison Hemlock Control (%)	Common Teasel Control (%)	Canada Thistle Control (%)	Poison Hemlock Control (%)
				9 DAT (May 16, 2018)			52 DAT (June 28, 2018)
1	DMA 4	4	PT/A	52 ab ¹	10 cde	55 ab	98 a
2	Freelexx	4	PT/A	35 ab	10 cde	13 d	90 abc
3	Milestone	5	FL OZ/A	40 ab	30 b	50 abc	82 c
4	Method	15	FL OZ/A	68 a	55 a	25 bcd	98 a
5	Solution Water Soluble	2.28	LB/A	45 ab	20 bcd	63 a	91 abc
6	Garlon 3A	1.5	QT/A	33 bc	5 de	5 d	97 ab
7	Vastlan	1.1	QT/A	50 ab	13 cde	18 cd	98 ab
8	Opensight	2.5	OZ/A	40 ab	25 bc	58 ab	87 bc
9	Nontreated Check			0 c	0 e	0 d	0 d

All herbicide treatments contained the adjuvant, Activator 90 at 0.25% v/v.

¹ Means within a column followed by the same letter are not different according to Fisher's LSD at $P < 0.05$.

² Treatments applied May 7, 2018

Non-Crop and Invasive Vegetation Management Weed Science
2019 Annual Research Report

Table 3. Herbicide Treatments, Application Rates, and Assessment Data. 2

Trt. No.	Product Name	Rate	Rate Unit	Poison Hemlock	Common Teasel	Canada Thistle
				Amount (0-10) ³	Amount (0-10)	Amount (0-10)
				374 DAT (May 16, 2019)		
1	DMA 4	4	PT/A	4.6 ab ¹	1.3 ab	1.7 ab
2	Freelexx	4	PT/A	4.6 ab	0.7 b	3.3 a
3	Milestone	5	FL OZ/A	4.3 ab	0.3 b	1.3 ab
4	Method	15	FL OZ/A	4.3 ab	0.0 b	0.3 b
5	Solution Water Soluble	2.28	LB/A	2.5 b	0.3 b	1.7 ab
6	Garlon 3A	1.5	QT/A	4.0 ab	2.7 a	2.0 ab
7	Vastlan	1.1	QT/A	5.3 ab	0.3 b	2.3 ab
8	Opensight	2.5	OZ/A	7.0 a	0.3 b	1.3 ab
9	Nontreated Check			7.3 a	0.7 b	2.0 ab

All herbicide treatments contained the adjuvant, Activator 90 at 0.25% v/v.

¹ Means within a column followed by the same letter are not different according to Fisher's LSD at $P < 0.05$.

² Treatments applied May 7, 2018.

³ Visual assessment of coverage and volume of biomass

Figure 1: View of the Opensight and Control Plots 9 DAT (May 16, 2018)

The effects of the herbicide treatment are quite dramatic on the poison hemlock!

