

EVALUATION OF HERBICIDES FOR ROADSIDE WEED CONTROL, 1997-1999

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Abstract

Fall- and spring-applied residual herbicides were evaluated at the Jefferson County landfill in an area to simulate roadside weed control. Two rates of Milestone alone and in combination with Oust and Karmex were compared to traditional roadside weed control programs. Herbicides applied March 6, 1998 provided better control than those applied November 6, 1997. Milestone at 20 oz/a provided the best control of little bur (*Ranunculus testiculatus*) and kochia (*Kochia scoparia*) through February 19, 1999. This performance was followed by Milestone at 10 oz/a and Milestone in combination with Oust (sulfometuron methyl) and Karmex (diuron). These treatments provided greater control than traditional treatments with Oust plus Karmex, Oust plus Krovar (bromacil + diuron), Oust plus Velpar (hexazinone), and Krovar alone. All treatments provided excellent control of grass species.

Introduction

Milestone is a residual herbicide that is expected to be registered in the near future. Because it is from a different chemical family than other residual herbicides currently used for roadside weed control, it could be a valuable tool in resistance management programs. This project was established at the Jefferson County landfill to evaluate Milestone alone and in combination with several other herbicides. These treatments were compared to standard herbicide programs. Both fall- and spring-application timings were evaluated.

Methods and Materials

Herbicides evaluated included Milestone alone at 10 oz/a and 20 oz/a and in combination with Oust at 3 oz/a and Karmex at 8 lb/a. These treatments were compared with Oust at 3 oz/a plus Karmex at 8 lb/a, Oust at 3 oz/a plus Krovar at 6 lb/a, Oust at 3 oz/a plus Velpar at 2 lb/a, and Krovar alone at 8 lb/a. Herbicides were applied November 6, 1997 and March 6, 1998, to separate sets of plots using a 9-ft CO₂ pressurized boom sprayer with 8003 nozzles at 40 psi and 30 gal/a water. Roundup at 1.5 qt/a was applied in combination with treatments of Milestone alone for control of emerged seedlings on the March 6 treatment date. Ten-ft x 20-ft plots were replicated 3 times in a randomized complete block design.

Plots were evaluated with the assistance of Brett Dunn on June 30, 1998 and February 19, 1999. Additional evaluations were conducted alone on May 19 and August 31, 1999. Plots will continue to be monitored to determine longevity of herbicide treatments and to document when the different weed species begin to appear.

Results and Discussion

The only weed that emerged for the June 30, 1998 evaluation in the plots treated November 6, 1997 was kochia (Table 1). Treatments that were not rated as providing adequate kochia control were effective eventually nevertheless, as no carcasses were visible during later observations. Plots treated March 6, 1998 had only a scattering of perennial weeds present (Table 2) at the June 30, 1998 evaluation. Treatments continued to hold without additional weed germination until winter rains.

Plots again were evaluated February 19, 1999 for control of little bur, kochia, and grass species. Treatments applied March 6, 1998 (Table 4) provided better control across herbicides than those applied November 6, 1997 (Table 3). All treatments provided essentially 100 percent control of the grass species.

For the November application, Milestone at 20 oz/a provided 98 percent control of little bur and 100 percent control of kochia, followed by Milestone at 10 oz/a with 84 percent control of little bur and 99 percent control of kochia. Milestone plus Oust and Milestone plus Karmex both provided 82 percent control of little bur and 95 percent control of kochia.

Plots treated in March with Milestone at 20 oz/a provided 100 percent control of both little bur and kochia. Milestone plus Oust provided 100 percent control of little bur and 99 percent control of kochia, while Milestone plus Karmex provided 100 percent control of both species. Milestone at 10 oz/a gave 98 percent control of little bur and 99 percent control of kochia.

The November 6, 1997 treated plots evaluated May 19, 1999 indicate 100 percent control of chickweed, grasses, kochia, and mustards with Milestone at 20 oz/a. This was followed by Krovar I with 99 to 100 percent control across weed species, and Oust plus Korvar I at 96 to 100 percent control across the four weeds evaluated (Table 5). In comparison, five of the treatments applied March 6, 1998 still provided 100 percent weed control May 19, 1999 (Table 6).

Plots again were evaluated August 31, 1999 (Table 7). Milestone at 20 oz/a continued to provide 100 percent weed control, followed by Oust plus Krovar I at 99 percent control of kochia, and Korvar I alone at 99 percent kochia control for spring-applied, compared to 96 percent control for fall-applied treatments. Milestone at 10 oz/a continued to provide 98 percent kochia control for spring-applied, compared to 80 percent kochia control for fall-applied treatments.

Table 1. Herbicides applied to the Jefferson County, OR landfill on November 6, 1997 and evaluated for control of roadside weeds on June 30, 1998.

Treatment	Rate (product/a)	Kochia Control (%)
Milestone	10 oz	67 a
Milestone	20 oz	100 a
Milestone	10 oz	100 a
+ Oust	3 oz	100 _a
Milestone	10 oz	
+ Karmex	8 lb	
Oust	3 oz	100 a
+ Karmex	8 lb	
Oust	3 oz	99 a
+ Krovar I	6 lb	
Oust	3 oz	55 a
+ Velpar	2 lb	
Krovar I	8 lb	100 a
Untreated		0 b

'Means separation with Student-Newman-Keuls P0.05.

Table 2. Herbicides applied to the Jefferson County, OR landfill on March 6, 1998 and evaluated for control of roadside weeds on June 30, 1998.

Treatment	Rate product/a	Weed Control			
		Alfalfa	Rabbit brush	Diffuse knapweed	Crested wheat
		number of plants per plot			
Milestone	10 oz	0.3	0.7 0	b'	0 b
Milestone	20 oz	0.7	1.3		
Milestone	10 oz	1.3	0 0.3	b	0.7 b
+ Oust	3 oz				
Milestone	10 oz	1.3	1.7 0	b	0 b
+ Karmex	8 lb				
Oust	3 oz	2.0	0 0	b	0 b
+ Karmex	8 lb				
Oust	3 oz	0	0 0	b	0 b
+ Krovar I	6 lb				
Oust	3 oz	3.3	0 0	b	0 b
+ Velpar	2 lb				
Krovar I	8 lb	0	0 0	b	0 b
Untreated		8.7	1.0 1.3	a	10.0 a
		n.s.	n.s.		

'Means separation with Student-Newman-Keuls P0.05.

Table 3. Herbicides applied to Jefferson County, OR landfill on November 6, 1997 and evaluated for control of roadside weeds on February 19, 1999.

Treatment	Weed Control		
	Rate product/a	Little bur	Kochia
Milestone	10 oz	84 a'	99 a
Milestone	20 oz	98 a	100 a
Milestone	10 oz	82 a	95 a
+ Oust	3 oz		
Milestone	10 oz	82 a	95 a
+ Karmex	8 lb		
Oust	3 oz	65 a	99 a
+ Karmex	8 lb		
Oust	3 oz	63 a	93 a
+ Krovar I	61b		
Oust	3 oz	58 a	43 b
+ Velpar	2 lb		
Krovar I	8lb	53 a	100 a
Untreated		0 b	0 c

'Means separation with Student-Newman-Keuls P0.05.

Table 4. Herbicides applied to the Jefferson County, OR landfill on March 6, 1998 and evaluated for control of roadside weeds on February 19, 1999.

Treatment	Weed Control		
	Rate product/a	Little bur	Kochia
Milestone	10 oz	98 a'	
Milestone	20 oz	100 a	100 a
Milestone	10 oz	100 a	99 a
+ Oust	3 oz		
Milestone	10 oz	100 a	100 a
+ Karmex	8lb		
Oust	3 oz	74 a	97 a
+ Karmex	8lb		
Oust	3 oz	82 a	a
+ Krovar I	6 lb		
Oust	3 oz	77 a	99 a
+ Velpar	2 lb		
Krovar I	81b	81 a	99 a
Untreated		0 b	0 b

'Means separation with Student-Newman-Keuls P0.05.

Table 5. Herbicides applied to the Jefferson County, OR landfill on November 6, 1997 and evaluated for control of roadside weeds May 19, 1999.

Treatment	Rate product/a	Weed Control			
		Chickweed	Grass	Kochia	Mustard
Milestone	10 oz	33 ab'	99 a	100 a	33 ab
Milestone	20 oz	100 a	100 a	100 a	98 a
Milestone	10 oz	87 a	100 a	97 a	87 a
+Oust	3 oz				
Milestone	10 oz	50 ab	99 a	99 a	67 a
+Karmex	8 lb				
Oust	3 oz	100 a	96 a	88 b	97 a
+Karmex	8 lb				
Oust	3 oz	100 a	97 a	96 a	100 a
+Krovar I	6 lb				
Oust	3 oz	100 a	80 b	0 c	100 a
+Velpar	2 lb				
Krovar I	81b	100 a	99 a	99 a	100 a
Untreated		0 b	0 c	0 c	0 b

'Means separation with Student-Newman-Keuls

Table 6. Herbicides applied to the Jefferson County, OR landfill on March 6, 1998 and evaluated for control of roadside weeds May 19, 1999.

Treatment	Rate product/a	Weed Control	
		Grass	Kochia
Milestone	10 oz	100 a'	100 a
Milestone	20 oz	100 a	100 a
Milestone	10 oz	100 a	99.3 a
+Oust	3 oz		
Milestone	10 oz	100 a	100 a
+Karmex	81b		
Oust	3 oz	99 b	95 a
+Karmex	8 lb		
Oust	3 oz	100 a	100 a
+Krovar I	6 lb		
Oust	3 oz	100 a	97 a
+Velpar	21b		
Krovar I	8 lb	100 a	100 a
Untreated		0 c	0 b

'Means separation with Student-Newman-Keuls P0.05.

Table 7. Herbicides applied to the Jefferson County, OR landfill on November 6, 1997 and March 6, 1998 and evaluated for control of roadside weeds on August 31, 1999.

Treatment	Kochia Control		
	Rate product/a	November 6, 1997	March 6, 1998
Milestone	10 oz	80 a'	98 a
Milestone	20 oz	100 a	100 a
Milestone	10 oz	78 a	96 a
+Oust	3 oz		
Milestone	10 oz	78 a	98 a
+Karmex	8 lb		
Oust	3 oz	65 a	57 b
+Karmex	8 lb		
Oust	3 oz	99 a	99 a
+Krovar I	6 lb		
Oust	3 oz	30 b	91 a
+Velpar	2 lb		
Krovar I	8 lb	96 a	99 a
Untreated		0 c	0 c

'Means separation with Student-Newman-Keuls P0.05.