

Garlic Tolerance to Bromoxynil

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Abstract

Bromoxynil is vital for postemergence broadleaf weed control in garlic. However the current registration for bromoxynil on garlic limits its utility. The objective of these trials was to determine if garlic could tolerate bromoxynil at more than 0.5 lb/acre per season and applied after garlic was 12 inches tall. Two trials were conducted in commercial fields of garlic grown for seed, one near Prineville, Oregon and one near Culver, Oregon. Bromoxynil was applied at timings adequate to control weeds germinating in early spring, late spring, and early summer. Across both locations, garlic injury was observed only following the early spring application of bromoxynil at 1.0 lb/acre. Blue mustard, a winter-annual weed, was controlled well with an early spring application of bromoxynil; however, common lambsquarter and black nightshade, two summer-annual weeds, were controlled only with late spring or early summer applications of bromoxynil.

Introduction

The current registration for bromoxynil (Buctril[®] 2 EC, Bayer Crop Science) on garlic requires that bromoxynil be applied before garlic reaches 12 inches in height and use is restricted to 0.5 lb/acre (2 pt product/acre) per season. Bromoxynil is a contact herbicide with little or no soil residual weed control activity. Garlic grown for seed is not a very competitive crop and presents opportunity for weed germination throughout the spring and early summer because it is not a very competitive crop and it does not form a dense canopy. Hand weeding costs in garlic would be reduced if bromoxynil could be applied at a higher rate per season and later in the season than what is allowed on the current label. The objective of these trials was to determine if garlic could tolerate bromoxynil at more than 0.5 lb/acre per season and applied after garlic was 12 inches tall.

Materials and Methods

Two trials were conducted in commercial fields of garlic grown for seed, one near Prineville, Oregon and one near Culver, Oregon. Bromoxynil was applied at timings adequate to control weeds germinating in early spring, late spring, and early summer (Table 1). Bromoxynil rates are shown in Table 2. Plots were 8 ft by 30 ft with four replications arranged as randomized complete blocks. Treatments were applied with a CO₂ backpack sprayer delivering 20 gal/acre operating at 20 psi and 3 mph. Crop injury and weed control were determined by making visual evaluations on a percentage scale.

Results and Discussion

Across both locations, garlic injury was observed only following the early spring (A) application of the higher rate of bromoxynil at 1.0 lb/acre (Table 2). Minor injury from the lower rate of bromoxynil (0.5 lb/acre) was observed in one plot of one treatment in

Culver. Injury observed on the garlic was recorded 11 to 14 days after application and appeared as early senescence of the lower leaves. No garlic injury was observed at either location from late spring (B) or early summer (C) applications of bromoxynil.

Blue mustard (*Chorispora tenella*), a winter-annual also known as Jim Hill mustard, was completely controlled with a single early spring application of bromoxynil at 0.5 lb/acre at Prineville (Table 3). An overactive hand-weeding crew prevented subsequent weed control evaluations at Prineville. At Culver, there were two summer-annual weeds present at low populations, common lambsquarter (*Chenopodium album*) and black nightshade (*Solanum nigrum*). These weeds were not controlled with the early spring application of bromoxynil, because they had not yet emerged. A subsequent application of bromoxynil in late spring (A + B) suppressed these two weeds, and another application of bromoxynil in early summer (A + B + C) controlled these weeds very well.

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Table 1. Bromoxynil application timing and garlic height for field trials conducted near Prineville and Culver, Oregon, 2007.

Application timing	Prineville		Culver	
	Date	Height (inches)	Date	Height (inches)
A (early spring)	April 5	6	April 16	6
B (late spring)	April 30	16	May 2	16
C (early summer)	June 8	24	June 8	24

Table 2. Garlic injury from bromoxynil applications near Prineville and Culver, Oregon, 2007.

Application timing	Bromoxynil rate (lb a.i./acre)	Prineville ¹	Culver ¹
		April 16 ²	April 30 ³
		----- % injury -----	
Check	---	0	0
A	0.5	0	0
A	1.0	15	8
A + B	0.5 + 0.5	0	0
A + B + C	0.5 + 0.5 + 0.5	0	2

¹No garlic injury was observed at either location from evaluations made on May 14, June 8, and June 21.

²Evaluation was made 11 days after application A.

³Evaluation was made 14 days after application A.

Table 3. Weed control from bromoxynil applications near Prineville and Culver, Oregon, 2007.

Application timing	Bromoxynil rate (lb a.i./acre)	Blue mustard ¹	Common lambsquarter ²	Black nightshade ³
		Prineville April 16	Culver June 21	
		----- % control -----		
Check	---	0	0	0
A	0.5	100	50	20
A	1.0	100	13	25
A + B	0.5 + 0.5	100	63	73
A + B + C	0.5 + 0.5 + 0.5	100	93	100

¹Blue mustard (also called Jim Hill mustard) was 3 inches in diameter at the time of application A.

²Common lambsquarter was 0.5 inches tall at application B. There was no common lambsquarter observed prior to application B.

³Black nightshade was 0.5 inches tall at application C. There was no black nightshade observed prior to application C.