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Use of Postemergence Herbicides for Weed Control on Clovers

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Summary

Six postemergence herbicides were evaluated at two rates on berseem, rose, and subterranean clovers. Basagran and Kerb caused no injury to any of the clovers. Chiptox and 2,4-D were the most phytotoxic but were less severe on subterranean than rose and berseem clovers. Applying 2,4-DB caused temporary leaf deformation and some plant stunting but resulted in no permanent injury.

Introduction

Producer concern about weed problems in pastures generally does not occur until after the weeds are present. Therefore, any possible chemical weed control is limited to postemergence herbicides. Unfortunately, most herbicides cleared for established rangeland and pasture, such as dicamba (Banvel, Weedmaster), picloram (Grazon, Torodon), and atrazine (Aatrex) are toxic to clovers (Ag Consultant and Fieldman, 1986; Smith, 1975; Conrad and Stritzke, 1980; Smith, 1986). There is limited data to indicate Basagran (Evers, 1983) and MCPA (Conrad and Stritzke, 1980) will control some broadleaf weeds without injury to the clover. Investigations of other potential postemergence herbicides for pastures containing clovers are needed.

Procedure

Soil type in the test area was a Mabank fine sandy loam with a pH of 7.8. The test was planted on October 29. Clover seeding rate was 15 lbs/A. The clover varieties were drilled into a prepared seedbed using a John Deere grain drill with a Tye seeder attachment. One hundred and fifty pounds per acre of 0-69-0 was applied on November 20.

Soil moisture at planting was excellent and 0.14 inches of rain fell on November 7 and 0.22 and 0.38 inches on November 13 and 14, respectively.

A small plot compressed air bicycle sprayer with three SS11002 nozzles spaced 20 inches apart was used to apply the postemergence herbicides 72 days after planting on January 26. Broadleaf weeds ranged in height from 2 to 6 inches. The sprayer delivered 20 gallons of water per acre at 25 psi pressure. Experimental design was a randomized complete block with four replications. Plot size was 76 inches wide by 26 ft long. A rating index (0 equals no injury or weed control to 100 equals complete injury or control) was used to evaluate the herbicide treatments. Broadleaf weed species included henbit (*Lamium amplexicaule*) and cutleaf eveningprimrose

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(*Oenothera laciniata*). Plots were rated 23 days (February 18, 1987) and 57 days after treatment (March 24, 1987).

Results and Discussion

When the rose clover was evaluated (Table 1), 23 DAT ratings indicated that 2,4-D at 0.75 and 1.5 lbs ai/A, Chiptox at 2.0 and 3.0 lbs ai/A and Rhonox at 1.0 lb ai/A produced significantly higher injury than the other

treatments. Broadleaf weed ratings indicated that only Basagran at 0.75 lbs ai/A resulted in less than 80 percent control. When the test was rated 57 DAT, only the two rates of 2,4-D caused major injury.

Subterranean clover (Table 2) was the most tolerant clover species to the postemergence herbicides. However, when evaluated 23 DAT, the 1.5 lbs ai/A rate of 2,4-D and Chiptox at 2.0 and 3.0 lbs ai/A resulted in significantly higher clover injury than the untreated check. At the

TABLE 1. EFFECTS OF POSTEMERGENCE HERBICIDES ON BROADLEAF CONTROL AND ROSE CLOVER

Treatment	Rate lbs ai/A	Percent Control or Injury ¹		
		18 Feb. 1987 (23 DAT)		24 Mar. 1987 (57 DAT)
		Broadleaf weeds	Clover	Clover
1. Check	—	0 e	0 d	0 c
2. 2,4-D	0.75	95 abc	86 a	97 a
3. 2,4-D	1.5	96 ab	86 a	100 a
4. 2,4-DB	1.0	86 bc	5 d	0 c
5. 2,4-DB	2.0	88 abc	8 d	0 c
6. Basagran + CO ³	0.75	68 d	0 d	0 c
7. Basagran + CO	1.5	85 bc	5 d	0 c
8. Kerb 50W	1.5	91 abc	0 d	0 c
9. Kerb	3.0	94 abc	3 d	0 c
10. Rhonox (MCPA isooctyl ester)	0.5	83 c	8 d	0 c
11. Rhonox	1.0	95 ab	20 c	0 c
12. Chiptox (MCPA sodium salt)	2.0	93 abc	53 b	0 c
13. Chiptox	3.0	99 a	56 b	16 b

¹Control and Injury Index: 0 = none, 100 = complete.

²Means followed by the same letter are not significantly different at the 0.05 level of significance (Duncan's Multiple Range Test).

³CO = crop oil (Agridex at 1 qt/A).

TABLE 2. EFFECTS OF POSTEMERGENCE HERBICIDES ON BROADLEAF WEED CONTROL AND SUBTERRANEAN CLOVER

Treatment	Rate lbs ai/A	Percent Control or Damage ¹		
		18 Feb. 1987 (23 DAT)		24 Mar. 1987 (57 DAT)
		Broadleaf weeds	Clover	Clover
1. Check	—	0 c ²	0 d	0 c
2. 2,4-D	0.75	86 a	20 abcd	13 bc
3. 2,4-D	1.5	90 a	30 ab	43 a
4. 2,4-DB	1.0	86 a	6 bcd	10 bc
5. 2,4-DB	2.0	70 ab	6 bcd	15 bc
6. Basagran + CO ³	0.75	60 b	6 bcd	8 bc
7. Basagran + CO	1.5	88 a	8 bcd	3 c
8. Kerb 50W	1.5	70 ab	0 d	0 c
9. Kerb	3.0	80 ab	0 d	0 c
10. Rhonox (MCPA isooctyl ester)	0.5	76 ab	10 bcd	6 bc
11. Rhonox	1.0	86 a	3 cd	0 c
12. Chiptox (MCPA sodium salt)	2.0	83 a	36 a	31 ab
13. Chiptox	3.0	93 a	28 abc	18 bc

¹Control and Injury Index: 0 = none, 100 = complete.

²Means followed by the same letter are not significantly different at the 0.05 level of significance (Duncan's Multiple Range Test).

³CO = crop oil (Agridex at 1 qt/A).

57 DAT rating 2,4-D at 1.5 lbs ai/A and Chiptox at 2.0 lbs ai/A produced significant higher injury than the untreated check.

At the 23 DAT evaluation on berseem clover (Table 3), only Basagran and Kerb did not produce a significant higher injury than the untreated check. Chiptox, 2,4-D and the high rate of Rhonox were very hard on Berseem. The 57 DAT rating reveal that injury was reduced in all herbicide treatments except the 1.5 lbs ai/A rate of 2,4-D and the 3.0 lbs ai/A rate of Chiptox which were 83 and 80 percent, respectively.

Basagran and Kerb caused no injury to any of the clover species. Kerb is cleared for use on clovers but moisture is necessary to activate the herbicide and the clover can not be grazed or harvested for 120 days after application. Applying 2,4-DB only harmed berseem but did cause temporary leaf deformation and some stunting of the other clovers. Chiptox and 2,4-D caused minor injury to subterranean clover but caused 50 to 85 percent on rose and berseem clovers.

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TABLE 3. EFFECTS OF POSTEMERGENCE HERBICIDES ON BROADLEAF WEED CONTROL AND BERSEEM CLOVER

Treatment	Rate lbs ai/A	Percent Control or Injury ¹		
		18 Feb. 1987 (23 DAT)		24 Mar. 1987 (57 DAT)
		Broadleaf weeds	Clover	Clover
1. Check	—	0 d ²	0 c	0 c
2. 2,4-D	0.75	96 abc	85 a	16 bc
3. 2,4-D	1.5	93 abc	81 a	83 a
4. 2,4-DB	1.0	96 abc	41 b	5 c
5. 2,4-DB	2.0	88 c	56 ab	11 c
6. Basagran + CO ³	0.75	91 abc	0 c	0 c
7. Basagran + CO	1.5	90 bc	0 c	0 c
8. Kerb 50W	1.5	90 bc	0 c	0 c
9. Kerb	3.0	93 abc	3 c	0 c
10. Rhonox (MCPA isooctyl ester)	0.5	88 c	43 b	0 c
11. Rhonox	1.0	96 abc	83 a	11 c
12. Chiptox (MCPA sodium salt)	2.0	96 ab	83 a	30 b
13. Chiptox	3.0	98 a	85 a	80 a

¹Control and Injury Index: 0 = none, 100 = complete.

²Means followed by the same letter are not significantly different at the 0.05 level of significance (Duncan's Multiple Range Test).

³CO = crop oil (Agridex at 1 qt/A).