EVALUATION OF ASULAM AND 2,4-DB CROP SAFETY AND DOCK CONTROL IN RED CLOVER GROWN FOR SEED

K.C. Roerig, N.P. Anderson, A.G. Hulting, D.W. Curtis, and C.A. Mallory-Smith

Introduction

Dock species (*Rumex* spp.) are persistent perennials in the Polygonaceae family that develop a robust taproot. Dock continues to be a problematic weed in clover grown for seed. Seed cleaners report that dock is frequently found in clover seed lots and is difficult to clean out of harvested seed, thus affecting clover seed quality (Anderson and Hulting, 2015). The difficulty associated with removing dock seed increases the importance of controlling this weed during seed production. However, currently registered herbicides for use in clover seed production provide poor control of dock species.

Asulam (Asulox) is a group 18 (DHP inhibitor) herbicide registered for use in alfalfa grown for seed. Past studies indicate that Asulam can be used to control dock in clover. 2,4-DB (Butyrac 200) is a group 4 herbicide (synthetic auxin) (Shaner, 2014) registered for use in soybeans, peanuts, alfalfa, and seedling birdsfoot trefoil. Both are considered potential candidates for registration in clover grown for seed through the IR-4 process. Fluthiacet was included in this trial because it is registered for broadleaf control in soybeans and may have potential uses in red clover seed production. None of these herbicides is currently registered for use in clover seed production.

Materials and Methods

This trial was conducted in a commercially grown red clover field in Yamhill County infested with a mixture of curly dock (*Rumex crispus* L.) and broadleaf dock (*Rumex obtusifolius* L.). Due to the difficulty of discerning between these two species, separate evaluation of control was not attempted.

Applications were made January 27 and March 6, 2015. Prior to harvest, dock seed heads were removed and counted, thus giving a quantitative measure of control and preventing contamination in harvested seed, which distorts clover seed yield data. Plots were windrowed into 6-foot swaths on August 11 and threshed with a small plot combine on August 17, 2015. The harvested seed was cleaned on an air screen cleaner, and clean seed weights were used to determine yield.

Results and Discussion

Application of 2,4-DB and Asulam provided the best control of dock when applied in early March. There were no significant differences between Asulam and 2,4-DB ($P = 0.05$) for dock control (Table 1). None of the treatments reduced clover seed yield or seed germination (data not shown).

Some leaf cupping was observed following the 2,4-DB application, but in this trial and in previous trials this effect has not resulted in a decrease in clover vigor or yield. 2,4-DB labels caution against the addition of nonionic surfactants in legumes due to increased risk of crop injury. In this trial, no additional injury was noted when a nonionic surfactant was added to 2,4-DB. Additionally, there were no differences in clover injury or yield or in dock control between the 1.0 and 1.5 lb ai/acre rate of 2,4-DB.

In previous studies, Asulam efficacy on dock species was reduced when Asulam was applied too early, while clover injury was unacceptable when applied too late. In this trial, the late January and early March timings seem to be within the optimal window of good dock control and acceptable crop injury. Split application did not improve control of dock species with either Asulam or 2,4-DB.

Fluthiacet safety in red clover was excellent, but it did not provide any dock control. Evaluation of this product will continue because it may control other important broadleaf weeds.

Conclusions

Results from this study and previous studies indicate that 2,4-DB and Asulam provide good control of dock and good crop safety, thus supporting registration of these products for use in clover grown for seed

References

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Table 1. Red clover tolerance and dock control in established red clover, 2015, Yamhill County, Oregon.

			------------ Dock ------------		---------- Red clover ----------	
	Rate	Date applied	Control[1]	Heads/plot[2]	Injury[2]	Seed yield[3]
	(lb ai/a)		(%)	(number)	(%)	(lb/a)
Untreated	—	—	0	70	0	284
Oxyfluorfen	0.094	Jan. 27	41	56	0	265
+ diuron	1.5	Jan. 27	—	—	—	—
+ paraquat	0.75	Jan. 27	—	—	—	—
Asulam	1.5	Jan. 27	74	25	15	289
+ NIS	0.418	Jan. 27	—	—	—	—
2,4-DB	1.0	Jan. 27	61	32	5	263
2,4-DB	1.5	Jan. 27	38	88	5	313
2,4-DB	0.75	Jan. 27	85	11	5	254
+ 2,4-DB	0.75	March 6	—	—	—	—
Asulam	0.835	Jan. 27	88	3	25	281
+ NIS	0.418	Jan. 27	—	—	—	—
+ asulam	0.835	March 6	—	—	—	—
+ NIS	0.418	March 6	—	—	—	—
Asulam	1.5	March 6	100	1	38	314
+ NIS	0.418	March 6	—	—	—	—
2,4-DB	1.0	March 6	95	9	0	306
2,4-DB	1.5	March 6	94	11	0	286
2,4-DB	1.5	March 6	86	2	0	297
+ NIS	0.418	March 6	—	—	—	—
Fluthiacet	0.00427	March 6	13	83	5	330
+ NIS	0.418	March 6	—	—	—	—
Fluthiacet	0.0064	March 6	31	59	0	351
+ NIS	0.418	March 6	—	—	—	—
LSD *P* = 0.05			32	78	19	104

[1]Visual evaluation June 25, 2015
[2]Visual evaluation July 27, 2015
[3]Harvested August 17, 2015