

“Spotlight” A New Tool for Broadleaf Control in Turf

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Abstract

Fluroxypyr was evaluated in combination with triclopyr, mecoprop-P (MCP), 2,4-D, and dicamba for broadleaf weed control in turf. Numerous field trials were conducted across the country in 2002-2003 utilizing common protocols. Treatment combinations were applied as a liquid spray and on a granule carrier. Performance comparisons were made with liquid and granule combinations of triclopyr/clopyralid and MCP/2,4-D/dicamba. Broadleaf weed control evaluations were made approximately 4 and 8 weeks after treatment. Results from these field trials demonstrate liquid spray combinations of fluroxypyr with triclopyr or MCP provide greater than 90% control of narrowleaf plantain, white clover, and ground ivy. The same combinations provided greater than 80% control of dandelion. Granule combination of fluroxypyr and triclopyr resulted in approximately 80% control of white clover. These results are similar to those expressed by the comparison standards. A synergistic response was observed with the combination treatment of fluroxypyr and 2,4-D amine in controlling white clover, dandelion and broadleaf plantain.

Introduction

Management of broadleaf weeds in turfgrass can be challenging because of the weed complex that occurs. Such a complex often requires a mixture of herbicides to achieve acceptable weed control. This is particularly challenging in residential turf because regulatory issues can reduce the herbicide options available to the homeowner and lawn care professional. Clopyralid, the highly effective herbicide used against difficult-to-control weeds such as white clover and other legume species, recently has fallen victim to regulatory issues and is no longer available for use on residential turf. Without clopyralid, herbicide options available to control difficult weeds in residential turf are limited. Fluroxypyr has been developed as an effective alternative for clopyralid in turfgrass. The data presented demonstrate the effectiveness of fluroxypyr on common broadleaf weeds.

Materials and Methods

Data developed from over 25 small plot replicated studies. A single postemergence (POST) spring application was made to actively growing weeds. Liquid applications were applied in a water volume of 20 to 40 GPA. Granule applications were applied via hand-shaker method. Weed control evaluations were made 4 and 8 weeks after treatment.

Weeds evaluated in studies;

- white clover (*Trifolium repens*)
- common dandelion (*Taraxacum officinale*)
- ground-ivy (*Glechoma hederacea*)
- broadleaf plantain (*Plantago major*)
- narrowleaf (buckhorn) plantain (*Plantago lanceolata*)

Field trials conducted at Cal Poly Pomona during the summer of 2005. Treatments were laid out in a randomized block design with four replicates. Data for control of broadleaf plantain, dandelion and white clover was fitted to Colby's synergistic and antagonistic response model for pesticide combinations (Colby, 1967).

In the liquid formulation trials the following treatments were evaluated;

Treatment Code	Herbicide Components	Application Rates lbs a.e./acre
FT	Fluroxypyr + Triclopyr	0.25 + 0.75
FM	Fluroxypyr + MCPP	0.25 + 1.1
FDD	Fluroxypyr + 2,4-D + Dicamba	0.25 + 1.0 + 0.12
FDT	Fluroxypyr + 2,4-D + Triclopyr	0.25 + 1.0 + 0.11
CT	Clopyralid + Triclopyr	0.18 + 0.58

In the granular formulation trials the following treatments were evaluated;

Treatment Code	Herbicide Components	Application Rates lbs a.e./acre
FT-G	Fluroxypyr + Triclopyr	0.25 + 0.75
FM-G	Fluroxypyr + MCPP	0.25 + 1.5
FDT-G	Fluroxypyr + 2,4-D + Triclopyr	0.25 + 1.0 + 0.37
CT-G	Clopyralid + Triclopyr	0.18 + 0.58

Results and Discussion

Fluroxypyr application at 0.5 lb a.e./acre controlled over 90% of the white clover 4 weeks after treatment (WAT). There was no significant difference in level of white clover control between the fluroxypyr (0.5 lb a.e./acre) and the triclopyr (0.42 lb a.e./acre) and clopyralid (0.14 lb a.e./acre) combination treatment at 8 WAT. The liquid formulations of fluroxypyr and triclopyr combination resulted in optimum control of narrowleaf plantain, dandelion, white clover and ground ivy at 4 WAT. There was no difference in percent control of white clover, narrowleaf plantain and dandelion between the fluroxypyr and triclopyr combination treatment and the clopyralid and triclopyr combination treatment at 8 WAT. The liquid herbicide applications of clopyralid and fluroxypyr provided better overall broadleaf weed control than the granule applications (Fig. 1).

Data for control of broadleaf plantain, dandelion and white clover was fitted to Colby's synergistic and antagonistic response model for pesticide combinations (Coby, 1967). The weed control data for the fluroxypyr treatment at 1 pt/acre, 2, 4-D amine treatment at 2 pt/acre and their combination treatment were fitted to Colby's model. The model calculated expected responses if the mixture was additive and then the data from the observed responses were compared to expected values. If the difference between the observed and expected response was zero then the response was additive. If the value was positive then the response was synergistic and when the value was negative then the response was antagonistic.

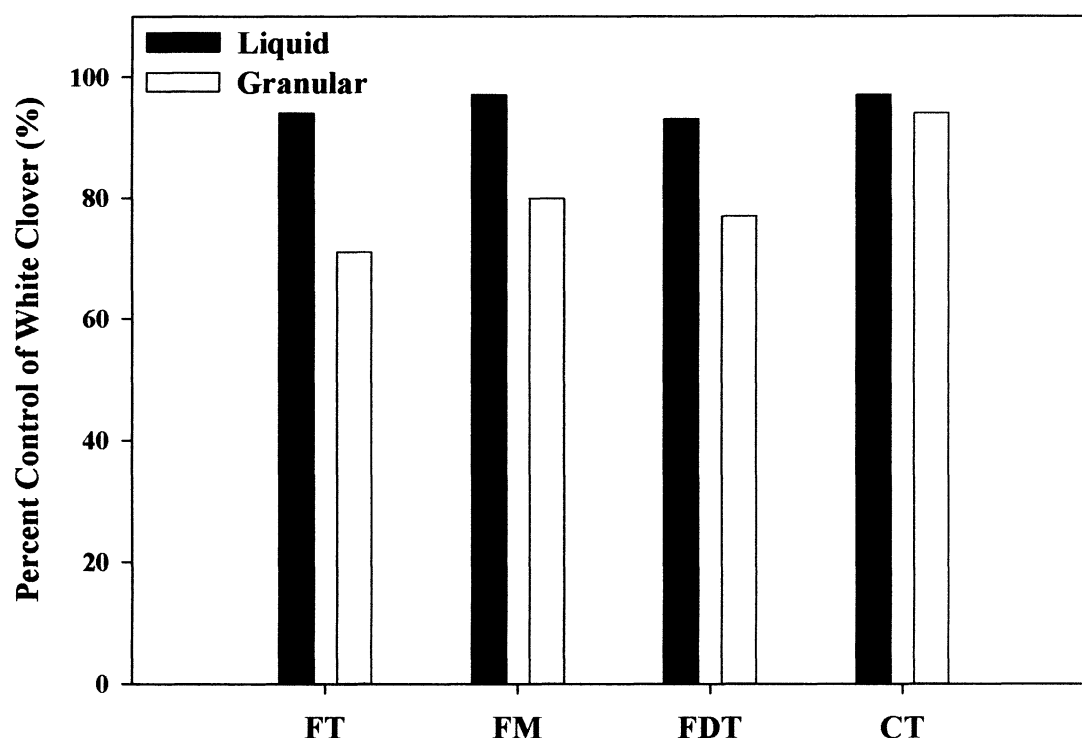


Figure 1. Effect of liquid and granular formulations on white clover control at 8 weeks after treatment (WAT). The FT, FM, FDT, and CT denotes fluroxypyr + triclopyr, fluroxypyr + MCP, fluroxypyr + 2,4-D amine + triclopyr, and clopyralid + triclopyr respectively.

Conclusion

The data clearly show that fluroxypyr is an effective alternative to clopyralid for broadleaf weed control in turfgrass. Results from the liquid and granule herbicide trials demonstrate the effectiveness of fluroxypyr-containing mixtures for control of key broadleaf weeds in turfgrass. Comparisons with clopyralid-containing mixtures show that fluroxypyr in mixtures provides comparable control of weeds such as white clover, common dandelion, ground ivy, and plantain species. As would be expected, the liquid herbicide applications of clopyralid and fluroxypyr provided better overall broadleaf weed control than the granule applications. A synergistic response was observed with the combination treatment of fluroxypyr and 2,4-D amine in

controlling white clover, dandelion and broadleaf plantain as observed at 2, 4, 6 and 8 weeks after treatment (WAT).

Table 1. Data for weed control was fitted to Colby's synergistic and antagonistic response model for pesticide combinations (Coby, 1967).

Weeds	Weeks after treatment	Spotlight	2,4-D	Combination	Coby's expected response if mixture is additive	Observed vs Expected
Broadleaf Plantain	2	10	13.5	33.8	22.2	11.7
	4	43.8	68.8	96.3	82.5	13.8
	6	50	73.8	96.3	86.9	9.4
	8	57.5	71.3	100	87.8	12.2
Dandelion	2	20	10	56.3	28.0	28.3
	4	41.3	68.8	92.5	81.7	10.8
	6	42.5	71.3	92.5	83.5	9.0
	8	66.3	75	100	91.6	8.4
White Clover	2	22.5	1.8	30	23.9	6.1
	4	51.3	30	96.3	65.9	30.4
	6	58.8	43.8	100	76.8	23.2
	8	62.5	41.3	100	78.0	22.0

References

Colby, S. R. 1967. Calculating synergistic and antagonistic responses of herbicide combinations. *Weed Sci.* 5:20-22.