

OPTIMIZING WINTER WEED CONTROL IN ESTABLISHED ALFALFA

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Winter weeds in alfalfa result in reduced alfalfa vigor, decreased quality, may even be poisonous, may lead to loss of crop stand, can influence the efficiency of insecticides, and may increase incidence of diseases. For some, or all, of these reasons the control of winter annual weeds may be desirable. In a broadcast crop like alfalfa I believe that the use of herbicides is the only satisfactory means of controlling the unwanted vegetation. The question then becomes what works best, and how can it be used to the best effect? Everyone involved in controlling weeds has probably been confronted at some time with less weed control than had been expected of a particular treatment; the question now becomes why? New herbicides may offer some possibilities, but I also want to show that the time of application can influence the results obtained.

Notwithstanding the statement made above about herbicides I feel that I must once again reiterate that a healthy, vigorous stand of alfalfa is the best method of weed control. Assuming that you are doing everything to the best of your ability, for your situation, and yet you have weeds coming into your hay, then you might ask 'how can I optimize my winter weed control with herbicides?'

Several herbicides, or combinations of herbicides, are registered for use in alfalfa in California; these include chlorpropham (Furloe), dinoseb non-selective (Dow General, Sinox General), diuron (Karmex), pronamide (Kerb), simazine (Princep), terbacil (Sinbar), and weed oil. They cannot all be used in all parts of the state, observe label restrictions. Recent registrations have increased the possibilities for weed control, at least in some parts of the state. The mixture of dinoseb plus chlorpropham has proved particularly successful in Sacramento valley tests. The combination has given effective control of most winter annual weeds, including chickweed, shepherds purse, groundsel, annual bluegrass, and wild barley.

The registration of terbacil for weed control in alfalfa has opened up some new possibilities in the Sacramento valley; this herbicide is not registered for use south of I 80. It is a very active chemical and has controlled essentially all weeds in tests conducted in recent years in the Sacramento valley, with the exception of speedwell (Veronica spp). Alfalfa has no inherent tolerance to this chemical and can be injured by it if the chemical gets into the root zone of the alfalfa; it should be used with caution on any light soil, or where the alfalfa roots are restricted to the extent that feeder roots are close to the soil surface (eg. due to disease injury to the tap root).

The other herbicides noted above have all been available for several years, and their uses and weaknesses have been discussed at previous symposia. It should, however, be re-emphasized that if diuron alone is used in a field with groundsel (Senecio vulgaris) present it will aggravate the problem as it does not kill this weed, which then grows better without the competition from the other weeds.

During recent years we have been testing herbicides applied at different times during the 'dormant' treating period. Results of treatments made in early/mid December have been compared with those applied in late January to early February. The results of two trials in Yolo county in 1975 and 1976 are shown in tables 1 and 2. A similar trial was conducted in 1977 but due to lack of rain the weed control was not considered typical of an average winter; trends were, however, similar to those reported here for the preceding years.

Treatments applied in mid December in the 1975 trial (Table 1) were universally superior to those applied in late January. Particularly notable examples of less weed control when applied in late January versus mid December were chickweed control with diuron, groundsel control with terbacil or with chlorpropham + dinoseb, and all other weed/herbicide interactions to a lesser degree. Weed control from most mid December applications were commercially acceptable to essentially complete; several of the later applications provided less than desirable control.

In the 1976 trial the best weed control was again obtained when the treatments were applied early in the winter treating period (Table 2). Grass control was excellent with diuron + dinoseb, chlorpropham + dinoseb, or terbacil when applied Dec. 15, but was considerably reduced when applications were made on Feb. 10. The same type of results can be seen for the broadleaved weeds.

Table 1. Mixed winter annual weed control in established alfalfa in Yolo county, 1975.

Treatment	Rate lb/A	Date treated	Alfalfa vigor 4/3	Weed Control					
				Annual bluegrass		Common chickweed		Groundsel	
				2/11	3/14	2/11	3/14	2/11	3/14
		A	9.8	0.0	1.3	0.0	0.0		
		B	9.5	0.0	2.0	0.0	0.0		
diuron		A	9.5	10.0	10.0	10.0	10.0		
		B	9.5	-	9.0	-	4.3		
diuron + dinoseb + 0.5% X-77		'5 A	10.0	9.8	10.0	9.9	10.0		
		B	9.8	-	9.4	-	2.5		
weed oil + dinoseb + 0.5% X-77		A	10.0	9.2	9.4	9.4	9.4		
		B	10.0	-	8.0	-	5.3		
dinoseb + 0.5% X-77		A	9.5	3.8	3.8	6.6	3.0		
		B	9.5	-	3.3	-	1.3		
chlorpropham + dinoseb + 0.5% X-77		'5 A	8.5	10.0	10.0	9.9	10.0		
		B	7.5	-	9.4	-	10.0		
pronamide		A	10.0	3.9	10.0	6.9	10.0		
		B	10.0	-	9.5	-	7.5		
terbacil		A	9.8	10.0	10.0	9.8	10.0		
		B	9.8	-	7.0	-	7.3		

All data are means of four replications.

All dinoseb treatments were the non-selective formulation.

Vigor: 0 = all dead, 10 = full vigor; Control: 0 = none, 10 = complete.

Treatment dates: A = Dec. 18, 1974, B = Jan. 30, 1975.

* - weed oil + dinoseb: 50 gal/A weed oil, 1.25 lb/A dinoseb plus 30 gal/A water.

All other treatments applied with a CO₂ backpack sprayer, 8003 nozzles, 30 psi, 40 gal/A

Table 2. Mixed winter annual weed control in established alfalfa in Yolo county, 1976.

Treatment	Rate lb/A	Date treated	Alfalfa vigor 3/11	Weed Control			
				Annual bluegrass		Broadleaved weeds	
				2/19	3/11	2/19	3/11
Untreated check	-	A	9.5	0.0	0.3	0.8	0.0
		B	9.5	-	0.0	-	0.0
diuron	2.4	A	9.0	6.4	7.1	0.8	4.0
		B	8.5	-	0.9	-	1.3
diuron + dinoseb + 0.5% X-77	2.4+1.75	A	9.2	8.4	9.5	8.4	9.4
		B	9.1	-	1.5	-	3.0
weed oil + dinoseb + 0.5% X-77	*	A	9.7	7.6	5.1	8.2	5.9
		B	9.8	-	4.8	-	8.0
dinoseb + 0.5% X-77	1.75	A	9.9	4.4	3.9	9.0	8.6
		B	9.1	-	0.6	-	3.5
chlorpropham + dinoseb + 0.5% X-77	3.0+1.75	A	9.2	8.0	7.6	9.9	8.6
		B	9.2	-	3.9	-	6.6
pronamide + dinoseb + 0.5% X-77	1.5+1.75	A	9.5	9.4	10.0	9.5	8.8
		B	9.3	-	2.4	-	5.3
terbacil	1.0	A	9.1	9.5	10.0	9.2	9.8
		B	9.0	-	1.9	-	2.9

All data are means of four replications.

All dinoseb treatments were the non-selective formulation.

Vigor and control, as above.

Treatment dates: A = Dec. 15, 1975, and B = Feb. 10, 1976.

* - weed oil same as above.

Application same as above.

Conclusions

Under some conditions the newer registered herbicides can provide weed control that is superior to that available using the older materials. It is also clear that to optimize your weed control you need to:

- a) grow your alfalfa in such a way that it is highly vigorous and thus competitive with weeds.
- b) choose the right herbicide for the weed species that you have present in the field.
- c) make the herbicide application as early as possible in the dormant season as possible, with the exception of weed oil/dinoseb on broadleaved weeds.

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