

WEED CONTROL IN SEEDLING ALFALFA

William D. McClellan and Vincent Schweers
Tulare County Farm Advisors

Several herbicides are available to alfalfa growers in the San Joaquin Valley for the control of weeds in seedling alfalfa stands. Heavy infestation of weeds, both broad-leaves and grasses in newly seeded alfalfa can lead to loss of stand and poor quality hay. Although preplant incorporated herbicides are presently used in weed management programs, there is little quantitative information available on their performance in the field in relation to the production and persistence of the alfalfa plant itself. Reported here are the results of a trial examining the effect of preplant herbicides on: (1) control of weeds in alfalfa fields; (2) yield of alfalfa and weeds; (3) stand persistence; and (4) hay quality.

Materials and Methods

Herbicides were applied preplant to an early spring seeding of alfalfa on the Lerda Ranch near Tulare, California. The variety Joaquin II was broadcast February 27, 1976 at a rate of 18 lbs/A. The soil type was Chino clay loam. The plot design was a randomized complete block with each of the five treatments replicated four times. Individual plots were 20' x 80' in size. The herbicide treatments and rates used were as follows:

- Untreated control.
- 2 benefin (Balan®) - 1.5 lb. active ingredients (ai)/acre
- 3 butralin (Amex®) - 1.5 lb.ai/A
- 4 EPTC (Eptam®) - 3.0 lb.ai/A
- 5 profluralin (Tolban®) - 0.75 lb.ai/A

These materials were applied at the above rates in 20 gallons of water per acre on February 26, 1976. Within one hour after application the herbicides were incorporated with a double disc and harrow to a depth of 3-5 inches.

Yields reported here represent 12' x 40' harvested areas from each plot with the yields adjusted to 0% moisture. The analysis for protein were made by Agri Tech Analytics Tulare, California. Within each plot were three areas from which stand counts, plant growth and weed competition data were obtained.

Results and Discussion

Spectrum of Weeds. The major grass weeds present were watergrass (Echinochloa sp.), foxtail (Setaria sp), cupgrass (Eriochloa sp.). The predominant broadleaf weeds were lambsquarter (Chenopodium sp.), pigweed (Amaranthus sp.), wild lettuce and others.

Yield Data. All herbicides were effective in suppressing weed yields throughout the season (Table 1). Although the yields of alfalfa alone were significantly higher in the herbicide treated plots, the total seasonal yield of alfalfa hay (alfalfa + weeds) was highest in the untreated control. In the herbicide treated plots (benefin being used as the example), the grass and broadleaf weeds represent 19.9% of the total yield and in the untreated control these weeds represent 61.1% of the total yield.

All the herbicides began to lose effectiveness in suppressing weed growth after the second harvest. However, the weed yields in the treated plots were still less than the control on the third and fourth harvests. This continued suppression of weed growth was associated with a more vigorous growth by the alfalfa plant in the treated plots. Individual alfalfa plants in the benefin treated areas averaged 0.98 and 1.01 grams per plant for the third and fourth harvest respectively. Plants in the control plots averaged 0.75 and 0.42 grams per plant for the same harvests.

Stand Persistence. Stand persistence is an important part of any alfalfa weed study (Table 2). These data support the findings of others that weeds are associated with significant reduction in stands of alfalfa. In the seedling stages (3/15 and 4/19) stands were not different, indicating that the herbicides did not reduce germination of the seed. After the first harvest the stands in the control plots were significantly lower, and this trend continued to the end of the season.

Summary. Preplant incorporated herbicides can be used successfully in spring planted alfalfa fields. The data presented here support this practice by showing that the proper use of a preplant herbicide resulted in the following: (1) effective weed control; (2) increased alfalfa yield and vigor over the entire first season; and (3) increased stand persistence.

Acknowledgements

We gratefully acknowledge the assistance provided by J. Lerda, Tulare and Agri Tech Analytics, Tulare. Technical assistance included J. H. Smith, D. Tisher, G. Weinberger, J. Soares and L. Shuklian.

TABLE 1. Effect of preplant herbicides on seasonal alfalfa and weed yields in 1976
Yields expressed as pounds per acre at 0% moisture. Lerda Ranch, Tulare.

<u>Treatment</u>	<u>HARVEST DATE</u>				<u>TOTAL YIELDS</u>
	<u>5/14</u>	<u>6/18</u>	<u>7/30</u>	<u>9/03</u>	
ALFALFA					
benefin	1152.9	1967.9	1302.6	946.7	5370.1
profluralin	1205.2	1760.2	1352.7	943.3	5261.4
butralin	1118.5	1853.0	984.8	876.2	3832.5
EPTC	914.8	2181.8	1034.9	663.9	4795.2
Control	1057.3	1318.3	698.0	499.6	3573.2
GRASS					
benefin	8.5	46.0	875.9	267.0	1197.4
profluralin	6.1	104.2	979.6	269.5	1359.4
butralin	7.9	93.2	1650.3	280.4	2031.8
EPTC	0.0	21.0	1622.2	157.6	1923.6
Control	423.0	1252.2	2902.4	530.9	5108.5
BROADLEAVES					
benefin	34.7	32.5	67.4	.0	134.6
profluralin	4.9	2.8	.0	12.3	20.0
butralin	7.9	47.3	26.6	11.7	93.5
EPTC	0.0	8.6	139.8	8.3	156.7
Control	253.1	173.4	73.5	10.4	510.4
TOTAL YIELDS PER HARVEST					
benefin	1196.1	2046.4	2245.9	1213.7	6702.1
profluralin	1216.2	1867.2	2332.3	1225.1	6640.8
butralin	1134.3	1993.5	2661.7	1168.3	6957.8
EPTC	914.8	2211.4	2796.9	829.6	6752.7
Control	1733.4	2743.9	3673.9	1040.9	9192.1

TABLE 2. Stand persistence following preplant herbicide treatments in alfalfa
Stands represent average number of alfalfa plants per square foot.
Lerda Ranch, Tulare.

<u>Treatment</u>	<u>DATE OF STAND COUNTS</u>					
	<u>3/15</u>	<u>4/19</u>	<u>5/24</u>	<u>6/28</u>	<u>7/28</u>	<u>9/15</u>
benefin	54.0	43.5	43.8	33.5	17.6	7.4
profluralin	51.0	41.5	40.7	28.5	16.8	7.2
butralin	52.0	39.0	41.7	31.3	13.8	7.7
EPTC	50.5	40.0	37.1	27.7	11.5	6.2
Control	49.5	39.5	30.0	17.0	7.5	4.5