SEEDLING ALFALFA WEED CONTROL TRIALS IN 1991 and 1992[1]

Mylen Bohle, John Nuemeister, Jim Fitzsimmons,
Juan Carlos Bielefeldt, Larry Burrill

Abstract

Three seedling alfalfa herbicide trials were conducted in central Oregon in 1991 and 1992. The locations were the Paul Kasberger farm in Lone Pine, the Mike McCabe Farm in Prineville, and the Central Oregon Agricultural Research Center (COARC), in Powell Butte, Oregon. Different herbicides for seedling alfalfa were tested. Six herbicides were evaluated for seedling alfalfa weed control. Herbicides evaluated were 2,4-DB, Buctril, Basagran, Tough, Pursuit, and Sencor. Percent control of selected weeds, as well as some forage yield and quality information was documented.

Introduction

Many acres of alfalfa are planted in central Oregon each year. Weeds can greatly damage alfalfa plant stands, sometimes even causing complete stand establishment failure. Herbicides reduce weed competition and may allow a weed-free first harvest. This may be beneficial for marketing the hay product. Sometimes there may be no difference in quality,
depending upon the weed species present. These trials were conducted to evaluate the effect of six herbicides and combinations of herbicides on seedling alfalfa and weeds.

Materials and Methods

Mike McCabe Farm: The alfalfa field was planted the first week of September 1991. The herbicides and rates used were 2,4-DB (1.0 lb a.i./a), Buctril (0.375 lb a.i./a), Basagran (1.0 lb a.i./a), Tough (0.9 lb a.i./a), Pursuit (0.0625 lb a.i./a), Pursuit plus Buctril (same rates as above), Pursuit plus Tough (same rates as above), and 2,4-DB plus Buctril (0.75 lb a.i./a and 0.25 lb a.i./a). Poast (0.28 lb a.i./a) was applied to all plots. X-77 (0.5 percent of carrier) was used as a surfactant. The herbicides were applied on October 18, 1991. Alfalfa was in the two to four trifoliate leaf stage. The experimental design was a randomized complete block with three replications. Plot size was 6 feet x 20 feet. A CO' backpack sprayer with a six-foot boom was used to apply the herbicides. Thirty-seven gallons of water per acre was the carrier. Weeds present were volunteer winter wheat (3 to 6 inches in height), and lambsquarters, nightshade, and wild buckwheat (0.5 inch to 1.5 inches in diameter). The trial was resprayed with Poast, at the same rate, in early spring. The plots

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were evaluated in outside the sprayed trial and from within the trial area. Percent weed control was visually appraised in May 1992. Samples of 0.25 m^2 were harvested with a hand sickle.

COARC: The field was planted to the alfalfa variety Ultra, on September 9, 1991. The herbicides and rates applied were the same as at the McCabe farm. The herbicides were applied on October 3, 1991, when the alfalfa was in the one to two trifoliate leaf stage. The weeds present were lambsquarters, redroot pigweed, groundsel, and winter rape (0.5 inch to 2 inches in diameter). Poast (0.28 lb a.i./a) was also applied to the trial, including the check. Other methods were the same as utilized at the McCabe Farm. The plots were evaluated in May 1992. The area harvested was 3.5 feet by 15 feet, using a forage plot harvester. One pound samples were taken for moisture determination, weighed, dried at 149 degrees Fahrenheit, and reweighed. Yields are presented on a dry matter basis. Harvest dates were May 28, July 14, and September 9, 1992.

Paul Kasberger Farm: The alfalfa field was planted in early June 1992. Herbicides and rates applied were Sencor (lx) (0.125 lb a.i./a) and (1.5x) (0.187 lb a.i./a), Buctril (lx) (0.125 lb a.i./a) and (2.0x) (0.25 lb a.i./a), Pursuit (lx) (0.63 lb a.i./a) and (1.5x) (0.94 lb a.i./a), 2,4-DB (1.0 lb a.i./a), and Sunit II (1 pt./a). Herbicides were applied on July 10, 1992 with an 8 foot boom, CO_2 backpack sprayer. The plot size was 8 foot x 25 feet. The alfalfa was in the eight to 16 trifoliate leaf stage, up to 1 foot tall. Weeds present were redroot pigweed (6 to 24 inches tall), lambsquarters (6 to 24 inches tall), nightshade, smartweed, wild buckwheat, witchgrass, and common mallow. Other methods were as reported for the other locations. The plots were evaluated in August 1992.

Results and Discussion

McCabe Farm: There was no difference in weed control for broadleaf weeds due to the volunteer winter wheat competition. The second application of Poast controlled the volunteer winter wheat. The total yield, both winter wheat and alfalfa, sampled from an area outside the trial area, was twice the weight as alfalfa (no weeds) in the treated plots. Poast had better effectiveness when spring applied.

COARC: The percent weed control and total dry matter hay yield data are presented in Tables 1-2. None of the herbicides controlled groundsel. 2,4-DB, Pursuit, Pursuit plus Buctril, Pursuit plus Tough, and 2,4-DB plus Buctril all controlled winter rape from 93 to 100 percent. Buctril gave moderate control, while Basagran and Tough were ineffective. For shepherdspurse control, Buctril, Pursuit, Pursuit plus Buctril, Pursuit plus Tough, and 2,4-DB plus Buctril, and 2,4-DB, all had 82 to 98 percent control. Basagran had low to moderate control and Tough had moderate control.

There were significant total dry matter yield differences between treatments on the first and third cuttings. The check had the highest total dry matter yield in the first cutting, which was significantly higher than all the herbicide treatments except for the 2,4-DB plus Buctril treatment. The weed control treatments that reduced yield were Pursuit plus Buctril and

Pursuit plus Tough. Both combinations had excellent weed control, but it appears that the alfalfa was stunted.

There was no difference among the treatments in total dry matter yield on the second cutting.

Interestingly, the two highest yielding treatments on the first cutting, the check and 2,4-DB plus Buctril, were the lowest yielding treatments on the third cutting. 2,4-DB was significantly higher yielding than Buctril, the check, Pursuit plus Buctril, and 2,4-DB plus Buctril. For the year, (for all three cuttings), there was no significant difference in total dry matter yield.

Table 1. Percent weed control by herbicides on selected weeds in seedling alfalfa at the COARC, Powell Butte, Oregon in 1992.

	Shepherdspurse	Groundsel	Winter Rape
Check	0	0	0
2,4-DB	82	0	93
Buctril	96	0	68
Basagran	57	0	48
Tough	70	0	18
Pursuit	88	0	100
Pursuit + Buctril	97	0	97
Pursuit + Tough	98	0	100
2,4-DB + Buctril	93	0	100
Mean	76	0	69
PLSD (.10)	26.6	NS	29.6
PLSD (.05)	36.0	NS	49.6
CV%	14.7	0	29.9

Table 2. First year total dry matter yield response to selected herbicides applied at seedling stage at COARC Powell Butte in 1992.

Herbicide	Cut 1		Cut 2		Cut 3		Total Yield
	Yield	Moisture	Yield	Moisture	Yield	Moisture	
	t/a	%	t/a	%	t/a	%	t/a
Check	3.31	75.6	2.16	80.5	1.97	78.8	7.44
2,4-DB	2.93	76.5	2.11	82.1	2.34	77.3	7.38
Buctril	2.82	76.1	2.11	81.5	2.07	78.5	7.00
Basagran	2.99	76.8	2.15	80.7	2.10	79.3	7.24
Tough	2.96	78.9	2.23	80.7	2.31	78.5	7.50
Pursuit	2.87	77.1	2.23	80.8	2.28	78.8	7.38
Pursuit + Buctril	2.62	77.1	2.23	81.0	2.03	78.0	6.88
Pursuit + Tough	2.66	76.0	2.20	82.3	2.25	77.8	7.11
2,4-DB + Buctril	3.07	75.6	2.21	82.0	1.85	78.2	7.13
Mean	2.91	76.6	2.17	81.3	2.13	78.4	7.22
PLSD (.10)	0.29	NS	NS	NS	0.27	NS	NS
PLSD (.05)	0.35	NS	NS	NS	NS	NS	NS
CV%	7.0	2.7	6.6	1.7	8.8	1.2	4.8

Paul Kasberger Farm: The data presented in Table 3 indicates percent stunting with some control, because of the advanced development stage of the weeds. The application of herbicides to this trial was delayed because of weather, and work schedules. The alfalfa and weeds were well beyond the herbicides' labeled growth stage for controlling weeds. Nonetheless, the applications were made to measure the effects of late applications on weeds and alfalfa.

Sencor (lx), Sencor (1.5x), Sencor (lx) + Buctril (lx), and Sencor (1.5x) plus Buctril (1.5x), all stunted alfalfa from 5 to 35 percent. The remaining treatments did not stunt alfalfa. The Sencor with Buctril combinations (highest alfalfa stunting) had the best control (stunting) of lambsquarters and redroot pigweed. The Pursuit plus Sunit II combinations stunted nightshade appreciably. These treatments also stunted lambsquarters and redroot pigweed moderately. None of the treatments had acceptable levels of control. All of these treatments were applied later than the label legally allows.

Table 3. Late herbicide application stunting effect on selected weeds and establishing alfalfa at the Paul Kasberger Farm, Lone Pine, Oregon in 1992.

Herbicide Treatment	Lambsquarters	Nightshade	Pigweed	Alfalfa
Sencor (1X)	5.0	0.0	26.7	5.0
Sencor (1.5X)	6.7	0.0	8.3	10.0
Sencor (1X) + Buctril (1X)	60.0	3.3	30.0	26.7
Sencor (1.5X) + Buctril (1.5X)	73.3	6.7	46.7	35.0
Buctril (1X)	5.0	6.7	5.0	0.0
Buctril (2X)	36.7	6.7	23.3	0.0
Pursuit (1X) + Sunit II	46.7	25.0	45.0	0.0
Pursuit (1.5X) + Sunit II	53.3	40.0	46.7	0.0
2,4-DB (1X)	5.0	3.3	6.7	0.0
Check	0.0	0.0	0.0	0.0
Mean	29.2	9.2	23.8	7.7
PLSD (.10)	14.1	12.8	23.8	6.2
PLSD (.05)	17.1	15.5	28.8	7.5
PLSD (.01)	23.4	21.2	39.5	10.3
CV%	34.1	98.3	70.6	57.1