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## **Weed Control in Alfalfa**

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### **Introduction**

Weeds can be highly competitive with alfalfa for water, light, nutrients, and space. Degree of weed control in the establishment of alfalfa is important for many reasons. Weed control determines, to a large extent, how successful stand establishment and subsequent maintenance will be. It also effects the yield and quality factors associated with the harvested crop.

Various weed control practices during alfalfa establishment were evaluated to determine effects on yield and quality of the first cutting. The study was conducted during the spring and summer of 1989 on the David Forgey farm 6 miles west of Logansport, IN.

### **Weed Control Practices**

The study consisted of ten different weed control practices replicated four times. Each plot measured 20' x 8' with 5' alleys between each of four replications. The following weed control practices were used:

Control (No treatment)  
Oats (As companion crop)  
Balan (benefin)  
Butyrac (2,4?DB)  
Buctril (bromoxynil)  
Balan + Butyrac  
Balan + Buctril  
Poast (sethoxydim)  
Poast + Butyrac  
Poast + Buctril

Oats were broadcast seeded and lightly worked into the soil at a rate of 2.5 bushel per acre on April 10 as a cultural control to reduce weed competition. Balan was also applied on April 10 as a pre-plant incorporated herbicide. Rate of application was 3 quarts per acre. Alfalfa was then planted that same day with a Brillion cultipacker- seeder (15 lbs. pure live seed per acre). All other treatments were applied post- emergence on May 30. Balan and Poast are control measures

for grasses while Butyrac and Buctril are used to control broadleaf weeds. Poast and crop oil concentrate, Butyrac, and Buctril were applied at rates of 1 pint and 2 pints, 2 quarts, and 1 pint per acre, respectively.

## **Results And Discussion**

Results were obtained for the following measures of weed control effectiveness: composition of forage harvested (Table 1); total yield, alfalfa yield, % dry matter and stand count (Table 2); nitrogen and acid-detergent fiber concentrations (Table 3).

### **Composition of Harvested Forage**

Balan + Buctril, Balan + Butyrac, and Poast + Buctril all resulted in a very high percentage of alfalfa. The high percentage of weeds in the control plots (84.9%) and excellent oats growth resulted in the least amount of alfalfa, 15.2 and 1.4%, respectively.

In terms of broadleaf weed control, Balan + Buctril, oats, Balan + Butyrac, Buctril alone, and Butyrac alone were most effective. As expected, control, Poast, and Balan treatments had the greatest percentage of broadleaf weeds. Also as expected, the Butyrac and Buctril treatments had the greatest percentage of grass weeds. It is important to note that for excellent total weed control a combination of good broadleaf and grass control is necessary. Balan + Buctril, Balan + Butyrac, and oats were most effective in reducing weed competition. It should be noted that while oats did an excellent job of suppressing weeds, they also provided tremendous pressure to the alfalfa. Also, when no weed control was used, broadleaf weeds effectively suppressed grass weeds, but grass weeds invaded stands with good broadleaf weed control.

### **Dry Matter Yield and Stand Count**

When yield of all plant material harvested was determined on July 3, oats were significantly higher yielding than all other treatments. However, when measuring alfalfa dry matter yield (total yield x % alfalfa in stand), oats had the poorest yield. Balan + Butyrac, Balan + Buctril, Balan alone, Poast + Buctril, and Poast + Butyrac were not significantly different in alfalfa yield, averaging 3331 lbs dry matter per acre.

Oats had the highest dry matter content at 35.1%. This would be expected as the oats were in the dough stage when harvested. Balan + Butyrac and Balan + Buctril also had high dry matter contents of 31.8 and 29.2% respectively. These two treatments also had the highest percentage of alfalfa at harvest with 92.6 and 97.6%, respectively.

Stand count gives an indication of the competition from uncontrolled weeds. Balan + Buctril, Balan + Butyrac, Poast + Buctril, and Balan alone averaged 11.9 plants per square foot while the oats had the fewest at 2.5 plants per square foot.

A strong relationship exists between stand count and alfalfa yield as the five treatments with highest alfalfa yields also had the highest stand counts.

### Forage Quality

Nitrogen (N) content, although not directly affecting digestibility, is considered an important forage quality factor. Total N is used to calculate crude protein (%N x 6.25 = crude protein). Oats had a significantly lower N content than any other treatment (Table 3). Acid detergent fiber is an indirect measure of digestibility. Higher acid detergent fiber values indicate lower digestibility. No differences were noted among treatments for acid detergent fiber. This may be due to soil contamination within the samples as harvest was conducted under very dusty conditions.

### Conclusions

Results of this study indicate that weed control during alfalfa establishment is important in determining the composition of the first cutting and stand. A combination of grass and broadleaf weed control was most advantageous. Oats reduced weed competition, but also reduced alfalfa yield and stand in this study. As far as chemical weed control, Balan in combination with Butyrac or Buctril resulted in fewest weeds in the first cutting. Stand count was similar when Balan or Poast was utilized in combination with Butyrac or Buctril.

Treatment	Alfalfa	Oats	Broadleaf Weeds	Grass Weeds	Total Weeds
	----- % of dry matter harvested-----				
Control	15.2	0.0	83.8	1.1	84.9
Oats	1.4	90.2	6.9	1.5	8.4
Balan	57.9	0.0	41.1	1.0	42.1
Butyrac	50.5	0.0	18.1	31.3	49.4
Buctril	56.9	0.0	12.2	30.9	43.1
Balan + Butyrac	92.6	0.0	6.9	0.5	7.4
Balan + Buctril	97.6	0.0	0.4	2.0	2.4
Poast	30.6	0.0	69.4	0.0	69.4
Poast + Butyrac	68.8	0.0	31.1	0.1	31.2
Poast + Buctril	72.3	0.0	27.5	0.3	27.8
BLSD*	25.3	4.1	24.8	9.3	26.5

\* BLSD (Bayes Least Significant Difference, k = 100; P approximately = 0.05)

Table 2. Yield and stand count when different weed control measures used at

alfalfa establishment.				
Treatment	Total dry matter yield n=3	Alfalfa dry matter yield n=3	Dry matter	Stand count
	lbs/acre	lbs/acre	%	plants/sq ft
Control	5307	873	20.2	5.3
Oats	10363	148	35.1	2.5
Balan	5163	3261	28.4	11.3
Butyrac	4429	2140	23.2	8.8
Buctril	4393	2377	18.7	7.0
Balan + Butyrac	3911	3970	31.8	11.3
Balan + Buctril	3784	3852	29.2	13.7
Poast	4413	1399	21.5	9.1
Poast + Butyrac	3364	2548	24.7	11.0
Poast + Buctril	3969	3026	27.3	11.3
BLSD*	843	1429	4.5	2.6

\* BLSD (Bayes Least Significant Difference, k = 100; P approximately = 0.05)

Table 3. Nitrogen and acid detergent fiber content of harvested forage.		
Treatment	Nitrogen	Acid detergent fiber
	-----% of dry matter-----	
Control	2.57	40.1
Oats	1.37	45.2
Balan	2.49	46.1
Butyrac	2.45	41.1
Buctril	2.57	42.4
Balan + Butyrac	2.43	46.9
Balan + Buctril	2.64	44.8
Poast	2.69	40.4
Poast + Butyrac	2.63	39.2
Poast + Buctril	2.59	43.9
BLSD*	0.33	10.1

\* BLSD (Bayes Least Significant Difference, k = 100; P approximately = 0.05)