



NEW WEED CONTROL TRENDS IN SEEDLING AND ESTABLISHED ALFALFA

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ABSTRACT

Weed control, or the more politically correct term, "vegetation management," ranks as the top pest management input of alfalfa production. Starting with newly seeded fields to those that survive seven to eight years, the techniques to battle weed invasions are topics of conversations at many morning coffee shops. Long time hay producers realize that weeds shorten alfalfa stand life, reduce yields, lower the nutritional hay quality and can adversely affect animals in many ways. This paper will discuss nonchemical vegetation management options currently being researched and new herbicide registration for both seedling and established alfalfa.

NONCHEMICAL CONTROL OPTIONS

Seedling Alfalfa:

Interseeding a nurse crop in newly planted alfalfa is not a new discovery. This approach has been used for many years to reduce wind and water erosion, protect seedling alfalfa from freezing and compete against weeds. Oats have long been the nurse crop of choice. More recent experiments are evaluating the merits of Berseem clover as an alternative to oats. Berseem clover is a winter annual legume which grows significantly better in winter months than alfalfa. Berseem's growth cycle continues until the early summer months at which time it diminishes its vegetative cycle and is overtaken by alfalfa.

Some benefits of Berseem compared to oats:

- Increased legume yields at first two cuttings of alfalfa
- Less susceptible to root rot problems associated with saturated soils
- Shows a high degree tolerance to many insects and diseases.
- Has not been affected by alfalfa weevil or many other insects

Berseem clover's potential pitfalls:

- Excessive winter growth can require an earlier than normal cutting. This can add to soil compaction problems. Earlier harvest times have a greater chance of rain damage.
- Berseem has not shown to be as competitive on weeds as oats and may require an herbicide treatment.

Growers' experience have demonstrated a preference to Berseem over oats for better quality forage and less competition to alfalfa.

Results in Table 1--yield and quality of herbicide treatments to oats and Berseem clover.

Established alfalfa:

During the final year(s) of an aging alfalfa stand, yields and dairy quality hay can quickly decline, allowing for rapid weed invasions. Herbicides at this stage only offer partial relief against new weed germination. As alfalfa plant spacing becomes further apart, there is less competition to weeds and usually an increase in herbicide is used. This significantly raises the grower expense while not always providing acceptable results.

Overseeding a companion crop of grass or a legume has proven to displace weed establishment, increase production and improve the quality of forage and with less herbicide use.

Table 2 illustrates weed control and yields from various companion crop treatments.

CHEMICAL WEED CONTROL

New herbicides:

Pursuit® is a new registered herbicide (September 1995) for use in seedling and established alfalfa. Pursuit applied postemergence will control many broadleaf weeds and some grasses. It is taken in through the foliage and roots and translocated by the xylem and phloem to the growing points of the weed. The addition of a nonionic surfactant or crop oil concentrate must be used. The addition of ammonium sulfate or comparable liquid fertilizer has increased the absorption rate of Pursuit into the leaves.

Pursuit herbicide may be applied postemergence to alfalfa beginning at the two trifoliolate leaf stage. The rate range is 3 to 6 oz. per acre based on the size of the weeds and environmental conditions. Pursuit can be tank mixed with other herbicides to broaden the spectrum. Buctril® or Butyrac® may be needed when fiddleneck, sowthistle, prickly lettuce and lambsquarter are present. Under heavy grass populations, the addition of Poast® herbicide should be used.

Pursuit also has soil residual activity to stop new emerging weeds. Pursuit also offers certain opportunities to be used in established alfalfa for difficult weeds (malva). However, the long soil life of Pursuit limits its continual use in established alfalfa and should be well understood to avoid plant back problems to future crops.

Zoriel® Rapid 80:

Zoriel is manufactured by Sandoz Corporation and is expected to gain full registration by October, 1996, in California and the United States. It will be used in established alfalfa at least five months old with plants having a 10 inch root depth. It will control broadleaf weeds and grasses when applied preemergence and incorporated by rainfall or irrigation. Some states may use a light tillage for incorporation of the herbicide. Zoriel is a pigment inhibitor herbicide absorbed through the roots and carried up the xylem tissue resulting in pigment loss and a white bleached appearance in susceptible weeds. The white color is followed by necrosis and death.

Experience in research trials show Zoriel to be effective on a wide range of winter weeds. If weed growth is present at spraying, a low rate of Gramoxone® or Velpar® combined with Zoriel will control existing vegetation. Winter applications will also provide grass control (foxtail, sp., barnyardgrass) into the early or mid-summer season.

A spring application following the first alfalfa harvest will suppress yellow and purple nutsedge. Plant back is 16 months to any crop not listed on the label.

Ultima® 160:

Ultima 160 herbicide for use on alfalfa was previously sold under the label name Poast. Ultima contains the same active ingredient (sethoxydim) as Poast. Changes have been made in the following areas:

- Ultima 160 contains 1.3 lbs. of active ingredient per gallon.
- Ultima contains an acidifying surfactant in the solution.
- Reduced product cost

The use rate in California is 28 to 37 oz. for annual grass control. A crop oil concentrate still must be added to the spray solution. The spray solution works best at a 5 to 6 pH and grasses must be actively growing and not under moisture stress for best results.

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Table 1

Weed Control in Seedling Alfalfa

First cutting 4/12/96

Trt #	Treatment	Lb/ai rate		% Composition				Lab analysis		
				Alfalfa	Weeds		Berseem clover	ADF	Protein	TDN
1			bc	63	27	-	-	24.7	24.4	57.4
			bc	63	27	-	-	27.5	19.6	55.5
			bc	93	7	-	-	27.8	24.7	55.3
			c	71	29	-	-	24.7	23.9	57.4
			c	75	25	-	-	26.7	22.6	56.1
			bc	76	24	-	-	24.8	24.4	57.3
			bc	80	20	-	-	25.3	24.0	57.1
8		2159	b	6	20	-	74	23.7	16.0	58.
9	30 lbs	8914	a	-	0	100	-	38.8	6.6	47.9
10		1830	bc	57	43	-	-	28.2	19.7	55.0

C.V. : 20.5% LSD = 33.6

Application:

¹ PPI

² Post

³ plant with alfalfa

Trt #	Yield lb/A @ 90% DM		----- % Composition -----			
			Alfalfa	Weeds	Oats	Berseem Clover
1	3227	b	100	0	-	-
2	2452	c	100	0	-	-
3	2696	bc	100	0	-	-
4	2667	bc	100	0	-	-
5	2725	bc	100	0	-	-
6	2739	bc	100	0	-	-
7	2775	bc	100	0	-	-
8	4001	a	34	0	0	66
9	634	d	0	25	75	0
10	2934	bc	80	20	-	-

Table 2

Alfalfa Overseeding Experiment 1991
Stockton, California
Forage yields (tons/acre) and weeds from six cuttings

Treatment	Forage yields	Weed yields
Montezuma oats	6.88	2.6
Paraquat (no till)	7.22	3.0
Tillage only	7.41	3.0
Untreated (no till)	7.58	2.8
"Debra" bromegrass	6.84	1.3
"Fawn" fescue	7.12	.9
"Latar" orchardgrass	6.92	.8
"Tetraploid" annual ryegrass	7.58	2.5
"Kemal" festulolium	6.42	.8
"Ensiler" oats	6.98	3.0
Paraquat + Velpar	7.54	1.9

Alfalfa Overseeding Experiment 1995
University of California, Davis
Forage yields (tons/acre) from three cuttings

Treatment	Forage yields	Weed yields
Alfalfa check	2.3	1.4
Alfalfa (weevil) spray	2.6	1.5
Berseem clover	3.0	1.1
Red clover	2.4	1.3
Orchardgrass	2.4	.4
Oats	3.1	.8