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## STRATEGIES FOR EXTENDING THE LIFE OF AN ALFALFA STAND USING OVERSEEDINGS

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### ABSTRACT

Deciding what to do with an older alfalfa stand is often a difficult decision. A crown population of 3-5 plants per square feet in a four to five year old field may or may not be profitable for one more season. Alfalfa growers would like to insure a profitable return when their decision is to keep the stand additional years. Options to overseed with forage grasses or legumes is gaining attention by increasing yields and improving quality.

### INTRODUCTION

This paper will discuss several years of field experiments conducted in different regions of California evaluating various overseeding practices using forage grasses and legumes. The information collected from the trials include yield, quality measurements, insect control (Table 1), and weed suppression; all of these a direct benefit of overseeding.

### PRE-PLANT PREPARATION

Seedbed preparation is the most important cultural practice to be successful prior to interseeding any variety. A five year old alfalfa stand has accumulated miles of wheel traffic, fifteen feet of irrigation water and animal grazing, all of which contribute to significant amounts of soil compaction. Lightly tilling the soil will break compaction layers and aerate the soil. It will also provide ample coverage of seeds to increase germination and seedling survival. Drag type harrows, spring tooth cultivators and new PTO driven equipment available do an excellent job for seed bed preparation. Ideally, one should work towards scratching the soil to a 1-2 inch depth with minimum disturbance to existing alfalfa crowns. Planting can take place just before or after tilling by either broadcast, billion seeder or grain drill. The use of a ring roller has helped to firm the seed bed, holds soil moisture and promotes faster germination.

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## **INTERSEEDING WITH FORAGE GRASSES**

Interseeding oats into older alfalfa stands is not a new concept. However, there are other grass varieties that do offer advantages to oats. Other forage grasses can improve quality and remain season long, offering better insect and weed control. Perennial grasses can also co-exist with alfalfa for multiple years, spreading to areas where alfalfa is dying out.

Both annual and perennial grasses have been evaluated for many different attributes. Table 2 shows the yield benefit and competition to various weeds that grasses offer. In California alfalfa producers choose to overseed annual grasses of oats, barley or wheat when only one alfalfa harvest remains. Tetraploid type annual rye grass is now used more frequently in the San Joaquin Valley, providing excellent yields when two and sometimes three harvests are desired before alfalfa is removed. Several perennial grasses have also been evaluated for overseeding benefits in older stands. These include tall fescue, perennial ryegrass, kemal festulolium (ryegrass x fescue) and orchardgrass (Table 3). Perennial grasses offer a longer term approach of two or three years. Ryegrass and orchardgrass mixed with alfalfa is a popular hay choice for other than dairy cows.

Seeding perennial grasses are similar to annuals except seeding rate and seed depth is shallow since seed size is smaller. Perennial grasses germinate and grow slowly, therefore, planting time and conditions should be made to favor grass establishment. In the Central Valley of California fall seedings of grasses after last cutting followed with an irrigation have proven successful. Seeding rates of perennial grasses range between 8-12 lb. Per acre. Cereal grasses are planted at 30-50 lb./acre.

Fertilizer requirements differ from location to location; however, nitrogen applications in the spring have increased grass forage yields in both annuals and perennial types.

When ideal conditions exist, a ratio of 2:1 alfalfa to grass makes up the hay composition. As the alfalfa population declines, grass composition increases while maintaining yields. Market acceptance of alfalfa/grass mixture has proven excellent with the majority of sales directed towards the horse industry.

## **INTERSEEDING FORAGE LEGUMES**

Overseeding legumes into declining alfalfa stands offers several advantages to grasses. Legumes compliment alfalfa offering higher crude protein and lower ADF values favoring the dairy market. The legumes most often interseeded are Berseem and red clover.

Berseem Clover is a vigorous growing annual with excellent upright growth. Seeded in the fall it grows through the winter and able to withstand reasonably cold weather and does very well on saturated soils. It produces consistent yields through three cuttings eventually tapering off when hot temperatures occur in mid July. The forage quality is very good, is bloat resistant and less

affected by the Egyptian Alfalfa Weevil than is alfalfa. Berseem has boosted forage yields by two tons per acre over alfalfa in just four harvests (Table 4). Similar to annual grasses, Berseem comes on quickly, producing significant yields in spring and early summer. It is also noted that once the crop had slowed in mid-summer, the alfalfa stand was also ready to be removed.

Perennial red clover has also found a niche in extending production in older alfalfa stands. Similar to perennial grasses, red clover is slow to establish during the winter months. By mid season this clover quickly begins to fill in the void areas missing by alfalfa. Early yields with red clover is less dramatic than with Berseem but does offer the advantage of season long production and the opportunity of excellent quality forage (Table 5). Red clover also provides excellent competition to weeds often eliminating the need for herbicide use. It has also shown to have less feeding damage by the alfalfa weevil and alfalfa caterpillar, eliminating the need for an insecticide spray (Table 1).

### **SUMMARY**

Higher yields can be obtained when overseeding annual grasses or Berseem annual clover in depleted alfalfa stands. The highest yields are realized in the first two to three cuttings with alfalfa taken out thereafter.

Perennial grasses and red clover will not give the short term yield boost but will produce yields over a longer period (2-3 years). Perennial forages compete with weeds better than annuals, reducing herbicide use. Forage quality is enhanced when less weeds are present. Higher crude protein and TDN values results with red clover hay.

Interseeding grasses or Legumes offers an opportunity for certain producers whose fields are on the down hill side of production but still economical to keep one or two additional years. Interseeding will sustain or increase yields while minimizing chemical input. Before choosing a grass or a legume, you should understand the strengths and weaknesses that each forage type offers and the market opportunities that exist in your area.

Table 1. Percent Egyptian Weevil Damage to Alfalfa vs. Clover in the overseeded plots.  
1996 Yolo County .

Treatment	Weevil Count		% Alfalfa Damage <sup>1</sup>		% Clover Damage <sup>1</sup>	
	Mean <sup>2</sup>	SD	Mean	SD	Mean	SD
	54.5 a	9.6	18.3 b	5.8	-	-
	2.2 c	2.5	3.6 c	2.0	-	-
	6.7 c	4.6	5.6 c	3.1	-	-
	26.5 b	15.1	20.0 ab	5.0	1.4	0.3
	0 c	0	25.8 a	8.1	-	-
	51.5 a	10.3	16.9 b	3.4	-	-
	35.2 b	11.1	17.2 b	4.4	1.9	0.8

<sup>1</sup> Damage was determined by collecting 25 Alfalfa and Clover stems from each plot and assessing percentage of tissue loss.

<sup>2</sup> Means followed by different letters are significantly different at P < 0.05

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

Table 3. Seasonal forage yield following grass interplanting into established alfalfa.  
Lancaster, CA 1993.

Treatment	Forage Yield (tons/A)		
	1992	1993	Total
		9.33	
		8.27	
		6.62	
		7.13	
		7.06	
		7.09	
LSD 0.05			

Table 4.

**YIELD AND QUALITY ANALYSIS**  
Interseeded Treatments  
Stockton 1995

Treatment	Harvest Lbs/acre 85% DM				Total
	1st 4/3/95	2nd 5/16/95	3rd 6/19/95	4th 8/25/95	
Red clover + alfalfa	1503 b	2646 bc	2947 ab	858 a	7954
Berseem clover + alfalfa	2001 ab	5135 a	3051 ab	660 b	10,847
Alfalfa only	381 d	3297 b	2747 bc	812 a	7237

Table 5.

	Quality Analysis at Stockton Site Sampled 6/8/95		
	90% Crude Protein	90% TDN	100% ADF
Red Clover + Alfalfa			
Fresh forage	24.8	59.4	20.0
Bale	24.0	57.6	21.8
Berseem Clover + Alfalfa			
Fresh forage	22.9	56.7	26.7
Bale	23.9	55.8	27.0
Alfalfa only			
Fresh forage	30.4	61.2	20.7
Bale	24.8	59.4	23.6