

# SEEDING CLOVERS OR GRASSES INTO OLDER ALFALFA STANDS— BENEFITS AND HAZARDS

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## ABSTRACT

Deciding what to do with an older stand of alfalfa is often a difficult decision. A crown stand of 3-5 plants per square foot in a field four to five years old may or may not be profitable for one more season. Alfalfa growers would like to have options available to insure additional yields and profits in the final year of production.

## INTRODUCTION

This paper will discuss the most current research in progress being conducted in the central and northern parts of the state. Two studies completed in 1995 evaluated the benefits of interseeding berseem and red clover, orchardgrass and oats on the Davis campus research farm. The Stockton site was a five year old stand and included a 20 acre berseem interseeding on October 1994, and red clover interseeded on 20 acres in October 1993. The yields were taken during the 1995 growing season. Preparation on both sites included a light harrowing in October to remove weeds and break the soil crust to enhance a seed bed. Forage legumes and grasses were drill planted between ½ and 1" in depth. The Stockton site was irrigated up in October of 1994 and the Davis site was rainfall germinated. The following lists the practices completed for both sites:

	<u>Davis</u>	<u>Stockton</u>
Planted:	10/15/94	10/20/94
Seeding rate:		
Berseem clover:	16 lbs	18 lbs
Red clover:	12 lbs	12 lbs 10/93
Orchardgrass:	12 lbs	—
Oats:	50 lbs	—
Fertilizer:	—	150# Am Sul 4/15/95
Herbicide treatment:	—	1/95 Gramoxone .125 ai/acre
Insect treatment:	Lorsban	no insecticide
Harvest dates:	4/5, 6/5, 7/5 1995	4/3, 5/16, 6/19, 8/25

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## PROCEDURES

Pest populations were below normal through most of the alfalfa growing season. This is probably due to the cool wet conditions during the 1994-95 season. In the Davis trial the berseem, oats and orchardgrass plots had fewer weevils than the alfalfa alone which suggests that weevils prefer alfalfa to the overseeded forages. Although weevil counts were lower with the sweep net method in the overseeded plots, selective feeding to the alfalfa was observed resulting in significant damage to alfalfa, as seen in Table 1. The berseem and red clover had minimal weevil feeding injury and high yields. These legumes may eliminate the need for a weevil insecticide treatment.

Aphid counts were low through the growing season, averaging two per sweep at the Davis site. Even with the lower aphid numbers there still was a trend for lower population in the overseeded treatments of oats and berseem.

Alfalfa caterpillar and armyworm populations increased to the highest numbers by August, as shown in Table 3. At this date the lowest populations were found in the berseem, oats and orchardgrass plots, indicating a nonpreference for these forage species.

Yields were significantly increased over the alfalfa alone with berseem clover and oats. Higher yields was the trend at both sites when red clover was interseeded into alfalfa (Tables 4 and 5).

Yield alone cannot be the only factor to consider since some of the treatments showed a high percentage of weeds either early or late in the season in Table 6. For the early season winter weeds present at first cutting time, a green chop harvest may be necessary. Herbicide alternatives for winter weed control is limited with overseeding practices. A herbicide experiment was conducted at the Stockton site with selected treatments listed on Table 7. Velpar and Pursuit showed excellent weed control with good crop safety but poses a soil carryover limitation if the alfalfa is to be removed the same year and planted to another crop. Gramoxone was used at the  $\frac{1}{2}$  pt rate on the 20 acre berseem and clover field. This very low rate helped control small weeds and kept the 1st cutting clean but also reduced the yield of berseem clover at the 1st cutting by 10%. The high rate of Gramoxone of .5 lb ai or 2 pts/acre in the herbicide trial reduced or killed 75% of the berseem.

Quality of forages was measured at the Stockton site for the June harvest. Results listed on the Quality Analysis chart shows the crude protein, TDN and the ADF. Samples were taken from bales at the stack compared to fresh samples in the field. The quality of red clover plus alfalfa was similar to alfalfa in the bale. Berseem + alfalfa showed acceptable crude protein but higher in fiber than other forages as shown in the ADF column.

**Table 1. Percent Egyptian Weevil Damage to Alfalfa vs. Clover in the Overseeded Plots at UC Davis**

Treatment	Weevil Count	% Alfalfa Damage <sup>1</sup>	% Clover Damage <sup>1</sup>
	Mean	Mean	Mean
Alfalfa check	87.17	72.03	72.03
Alfalfa sprayed	2.33	43.81*	—
Berseem clover	40.00*	70.82	16.00*
Red clover	67.67	63.98	12.09*
Orchardgrass	43.33*	74.01	—
Oats <sup>2</sup>	0.00*	92.66*	—

<sup>1</sup> Damage was determined by collecting 20-30 alfalfa and clover stems from each plot and assessing percentage of tissue loss.

<sup>2</sup> Sweep net not effective on oats

\* Overseed treatments were significantly different from the Alfalfa Check,  $p < .05$

**Table 2. Aphids by Date and Treatment at UC Davis**

Treatment	3/7/95	3/28/95	8/2/95
	Mean	Mean	Mean
Alfalfa check	13.00	20.83	23.17
Alfalfa sprayed	23.83	1.17	27.83
Berseem clover	14.50	9.67	15.67
Red clover	17.83	12.17	14.00
Orchardgrass	36.17	19.50	7.67*
Oats	7.33	5.67*	8.17*

Numbers of insects per 10 sweeps

**Table 3. Means of Worms by Date of Treatment at UC Davis**

Treatment	6/5/95	7/5/95	8/2/95
	Mean	Mean	Mean
Alfalfa check	0.33	2.33	10.33
Alfalfa sprayed	0.33	2.33	10.50
Berseem clover	0.50	1.60	6.33
Red clover	0.67	4.00	13.00
Orchardgrass	0.00	2.25	3.33*
Oats	0.17	1.25	2.80*

Treatment	4/5/95 Mean	6/5/95 Mean	7/5/95 Mean	Treatment Totals to Date
Alfalfa check	1183.87 c	2030.57 ab	1362.48 c	4576.92
Alfalfa sprayed	1608.17 bc	2055.88 ab	1496.97 bc	5161.02
Berseem clover	1512.98 b	2366.58 a	2081.40 a	5960.96
Red clover	938.40 c	2131.18 ab	1802.92 ab	4872.50
Orchardgrass	1902.94 b	1841.45 b	984.03 d	4728.42
Oats	4552.96 a	1152.69 c	534.08 e	6239.73

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 bc	660 b	10,847
Alfalfa only	381 c	3297 b	2747 bc	812 a	7237

Herbicides applied = Gramoxone .125 lbs ai

Treatment	4/5/95 Mean	6/5/95 Mean	7/5/95 Mean
Alfalfa check	40.40 a	9.01	11.46 ab
Alfalfa sprayed	39.41 a	12.95	4.85 b
Berseem clover	28.39 ab	7.65	2.63 b
Red Clover	40.69 a	9.12	3.66 b
Orchardgrass	10.40 bc	7.23	0 b
Oats	0 c	3.57	21.12 a

abcd Means with different letters are significantly different at  $p < .05$

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

**Table 7 Herbicide Treatment and Yield Data on Berseem Clover + Alfalfa**

Treatment	Rate lb/a ai	1st Harvest 4/3/95	2nd Harvest 5/16/95	3rd Harvest 6/19/95	4th Harvest 8/25/95
Gramoxone	.5	294 c	2888 cd	2662 bc	781 ab
Pursuit + Surfactant	.094	2819 a	5921 a	3630 a	671 ab
Pursuit + Velpar TR-10	.094 + .375 + 2.0	1375 b	4949 ab	2985 ab	626 b
Velpar + TR-10	.375 + 2.0	1500 b	5034 ab	3098 ab	697 ab
Check (Berseem + alfalfa)	—	1549 b	4711 b	2493 bc	645 b

### SUMMARY

Higher yields can be obtained by overseeding berseem or oats into an alfalfa stand on the final year of production. It was also noted that once these crops had diminished by mid season so had the alfalfa stand. It should be understood that selecting either berseem or oats is for a short term gain to maximize yield production for two or three cuttings only and then to remove the alfalfa.

Red clover or orchardgrass did not give the same short term yield boost but may produce better quality feed (less weeds) throughout the entire season. Red clover and orchardgrass, being perennials, continue to grow during the summer months, competing more effectively against mid to late season weeds. Both of these forage types will also resume growth the following year.

It is important that a grower fully understand the benefits and hazards that differ between various forage legumes or grasses before engaging into the overseeding concept. Once understood, the opportunity to overseed certain grasses or legumes can be useful in developing certain niche markets while increasing production and lowering pest control cost in older alfalfa stands.