

#182
AGR. NOTES
DEC. 1959

CLOVER ESTABLISHMENT IN A DRY YEAR

A series of clover seedings were made in the fall of 1958 by Arthur Haig, Extension Field Technologist, in cooperation with farm advisors comparing band seeding, broadcasting and fertilization on clover establishment. Single super was used as fertilizer sources as it contained both phosphorus and sulfur. It was broadcast at the rate of 500 pound per acre (100# of P_2O_5) and bandseeded at the rate of 200 pounds per acre (40# of P_2O_5). These rates were used because it was presumed that these amounts of phosphorus would be more than adequate for good clover growth. A clover mixture consisting of equal amounts by weight of Rose, Crimson and Sub ($\frac{1}{2}$ Mt. Barker and $\frac{1}{2}$ Tallarook) was seeded at the rate of 12 pounds per acre.

These trials were laid out using a split plot design with the method of seeding as main plots and fertilization as sub plots, replicated five times. The average size of these trials was about one acre with individual plots 12.5' wide by 200' long. Two stand counts were made on all plots, an initial one for seeding establishment and final one to determine seed set. The results obtained are given in the table and recorded as per cent stocked. In addition to the trials on methods of seeding, two plots were put out to determine best rate of fertilization for band seeding.

The 1958-59 season was one of much below normal rainfall throughout the state with fall rains delayed until after Christmas, and with the major portion of the rainfall occurring during January and February, and with little or no effective rainfall after this time in most areas of the state. Except for the Van Vleck and Nissen plots, all the other clover trials were very severely affected by the lack of effective rains after the end of February.

Drilling gave a significantly better seedling stand than did broadcasting on all plots except on the Nissen, Orvis and Van Vleck plots, and only the Orvis plot did not have an excellent seedling stand. However, on the Hansen and Shellhammer plots there was no seedbed preparation on the broadcast treatments, while on the other plots, the broadcast treatments had the ground disced prior to seeding and seed covered by rolling or dragging a chain over the plots.

While there was no measurable effect on seedling counts on any test from bandseeding single super under the seed, the Hansen and Kent plots showed a very significant effect from the broadcast single super. The broadcast fertilizer treatment increased the seedling stand of clover on the Hansen plot but decreased the seedling stand on the Kent plot. This decrease in clover stand was probably the result of increased competition from the native species, stimulated by broadcast fertilizer. The Redding series, which was the soil on the Kent plot, usually gives a very marked response to phosphorus. The drilled fertilizer did not have any effect on stimulating the native species as it was placed in the furrow below clover seed. On the Hansen plot, however, the soil test showed an adequate level of soil phosphorus. As the clover seed was broadcast on an unprepared seedbed, the broadcast fertilizer would result in an increased availability of phosphorus for the germinating clover seed. This would result in a more vigorous clover seedling on the fertilizer plots, and therefore would increase chances for a better stand.

CLOVER ESTABLISHMENT TRIALS -- 1958-59

County Cooperator Soil Type	Farm Advisor	Rainfall				Seedling Counts					% Stocked					Soil Test for Phosphorus		
		Mean	1958-59	Date of Last Effective ppt.		Broadcast Drilled					Mature Stand							
				Date	P ₀	P ₁₀₀	P ₀	P ₄₀	(1)	Date	P ₀	P ₁₀₀	P ₀	P ₄₀	(1)			
Merced Hansen Sobrante cl.l.	Peterson Bedell	12.90"	9.36"	2-21 4-26	1.01" 1.11"	2-26	24	37	59	60	a** b** c**	5-12	1	0	1	0	ns	adequate
San Joaquin Kent Bros. Redding gr.l.	Moore	17.88"				1-29	54	40	69	70	a* b* c**	5-20	5	5	6	7	ns	very low
Sacramento Van Vlecks Pentz-Redding gr.l.	Elings	19.98"	12.27"	2-17 3-24 3-30 4-26	1.73" .33" .27" 2.61"	2-3 check burned	67	72	82	80	ns	5-11 check burned	12	26	25	49	a* b** a* b**	very low
Solano Olin Timm Newville gr.l.	Swenerton	23.84"	17.68"	2-21	.98"	2-4	87	80	93	95	a*	6-4	0	0	0	0		adequate
Solano Shellhammer Olcott-Capgy Complex		-----	12.59"	2-24	2.09"	2-9	60	60	90	90	a**	6-13	1	1	7	15	a*	low
Stanislaus Orvis Ranch Auburn st.s.l.	Thurber	17.55"		2-20		1-28	34	32	35	36	ns	5-19	8	8	5	7	ns	low
Yolo Nissen Ranch Newville-Capay Complex	Schoner	19.87"	16.15"	2-19-22	.75"	2-24	83	92	77	73	ns	4-28	42	53	44	42	ns	adequate

RATE TRIALS						P ₀	P ₁₀	P ₈₀	P ₁₆₀		P ₀	P ₁₀	P ₈₀	P ₁₆₀			
Colusa Sorenson Hilgate cl.l.	Helphenstine	14.01"	8.88"	2-21	.36"	2-2	79	79	74	67		5-18	0	0	0	0	adequate
Sacramento Howard Ranch Redding gr.l.	Elings					2-3	78	79	65	75		5-26?	7	9	13	17	very low

* Significant at 19:1 odds; ** Significant at 99:1 odds.

a Significant effect of drilling vs. broadcast.

b Significant fertilizer effect.

c Significant interaction--fertilizer on broadcast plots behaved differently than fertilizer on the drilled plots.

When the final stands counts were made, except for the Nissen and Van Vleck trials, there were very few clover plants maturing and setting seed. The lack of late rains had become the most important factor in clover establishment in spring of 1959 in many areas of the state. The late rains on the Hansen plot were too late to save the clovers but definitely helped the Medusa head.

While the Orvis plot had no measurable effect from any treatment for either seedling or mature stands, there was, however, a very visible color response on the broadcast fertilizer plots. The Nissen plot showed no visible or measurable effect between treatments, although there was good clover stand at the final count.

The Van Vleck trial also had an area burned to measure the effect of burning on Medusa head control and clover establishment. There was greater number of clover seedlings on the burned than on the non-burned area but there was no significant effect from any treatment on seedling stand counts. The mature stands had significantly greater plant count on the drilled and fertilized plots. Where the clovers were fertilized, they were about 6"-10" tall while on check areas there were only 4"-6" high. Burning reduced the stand of Medusa head but increased the stand of tar weed. The burned plots also had less native cover.

The rate trial laid out at the Howard Ranch showed no effect on seedling counts but the high rate (160# P_2O_5 per acre) gave a significant increase in the mature stand. The trial at Sorenson's, however, showed an inhibitory effect at the high fertilizer rate on seedling establishment.

The Howard plots had a very low soil phosphorus level while the plot at Sorenson's had an adequate soil phosphorus level. This suggests that on soils of low phosphorus status that we may be able to use a higher rate of bandseeded fertilizer without reducing stand establishment than on soils with an adequate phosphorus supply.

Even though there were very poor mature stands obtained, the results indicate that good stands can be obtained by drilling directly into the sod without prior seedbed preparation.

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AGK: NOTES
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RESEEDING ANNUAL LEGUMES FOR PASTURE

Annual clovers are continuing to turn marginal grain fields into profitable pastures. Indications are that more than 10,000 acres will be seeded this fall to mixtures based on Rose, Crimson and subclover. There are more than 500,000 acres of marginal grainland on the east side of the Central Valley that is potential clover pasture, and an equal acreage on the west slope of the Coast range can be improved by seeding with the annual clovers or with Lana vetch.

The annual legumes provide good feed in both the spring and fall grazing seasons.

Here are the 1965 production figures on a 90-acre Rose and subclover field in Placer County that was grazed in the spring and again in the fall. The same cattle were used in both grazing periods and were on irrigated pasture during the summer months.

Spring Period

3/29/65--6/18/65 (81 days)

Total weight in (86 hd.)	43170
Total weight out (86 hd.)	60373
Total gain spring period	17203
Avg./gain per head	200 lb.
Avg./gain per head/day	2.47 lb.

Fall Period

9/9/65--10/17/65 (38 days)

Total weight in (82 hd.)	60250
Total weight out (82 hd.)	66210
Total gain fall period	5960
Avg./gain per head	72.7 lb.
Avg./gain per head/day	1.91 lb.
Total pounds of gain/acre	257.4
Avg. daily gain/head, total period	2.29

At a selling price of 15-20 cents a pound for beef the field returned from \$38.55 to \$51.40 per acre. The annual costs including initial stand establishment, maintenance, land and livestock costs at present prices, are around \$21.00 per acre. On this basis then annual legume pasture may return as much as \$17 to \$30 per acre per year over costs.

The cost of dryland barley production varies from \$35 - \$40 per acre and the 1200 - 1500 pound per acre yield every two years may not even return production costs.

Reseeding annual legumes for pasture are one of the alternative crops the dryland grain producer should take a good look at in the planning of his future operation.

October and November are the best times to plant the reseeding legumes. Undisturbed grain stubble is the best seedbed for them. Here's an easy and highly successful way to get the job done:

1. Apply 500 lb. of single superphosphate per acre to the acre to be seeded.
2. Broadcast by air or ground rig 8-10 lbs. of legume mix (local experience should determine the species and amounts to be used) directly into undisturbed grain or hay stubble. Use pellet inoculated seed. (See AES publication AXT 200).
3. Roll twice with a spiketooth ring roller to cover the seed.
4. Graze in the spring to remove grass and weed competition and remove livestock during the clover blooming period.
5. Graze heavily during late summer and early fall to shatter seed and trample it into ground.