

MAY 12 1971

UNIVERSITY OF CALIFORNIA
AGRICULTURAL EXTENSION SERVICE

Date: May 11, 1971
To: William J. van Riet, Farm Advisor
Stanislaus County AES

DAVIS, CALIFORNIA

From: William E. Martin
Title: Extension Soils Specialist
Re: Grove clover plot

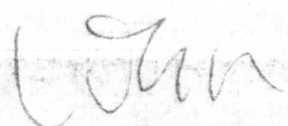
Dear Bill:

Enclosed are the summary sheets for the Grove clover plot for the four years of harvest. You will notice that last year and this year in total yield there was very little effect of fertilization. The first year and the second year there were some fairly positive increases due to phosphorus.

The total yield over a four-year period certainly is not much to sell fertilization. However, if you look over carefully the data for 1969 and 1970, you will see that in both years the yields of clover were increased by lime and that the yields of grass were proportionately decreased by lime. It would appear at this site the clovers and grass are fighting for space, sunlight, and water.

When we lime the soil we make clover happier and better able to fight for its survival. I am sure that we would have measured some phosphorus fertilization effects if we had not be plagued by the many cow droppings and urine spots in the check plots. We should do something about this. Your cows are poorly trained!

Sincerely,



WEM/bp

Enclosures

cc: L. Berry

P.S. I will send you data on chemical composition of 1971 forage as soon as the lab gets it done.

SUMMARY OF YIELDS AS LBS. DRY WT./AC.

Stanislaus - Calaveras - Grove Plot

<u>Treatment</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>4 Yr. Total</u>
Check	1580	1954	1659	1860	7053
Check plus Lime	1972	2184	1548	1583	7287
250 CSPA	2096	2602	1568	1881	8147
250 CSPA plus Lime	2438	2590	1474	1703	8205
500 Super	2236	2803	1579	2086	8704
500 Super plus Lime	2418	2600	1608	1844	8470
500 CSPA	2212	2697	1540	2009	8458
500 CSPA plus Lime	2068	2831	1679	1900	8478
1000 Super	2138	2797	1494	2050	8479
1000 Super plus Lime	2342	2888	1751	2078	9059
1000 CSPA	2432	2933	1595	2010	8970
1000 CSPA plus Lime	2390	2945	1671	2217	9223
2000 Super	2254	3082	1608	2186	9130
2000 Super plus Lime	2694	3071	1738	2193	9696
<u>LSD</u>	326				

EFFECT OF P+S RATE AND SOURCE AND LIME ON RANGE FORAGE

Stanislaus-Calaveras - April 18, 1968

P ₂ O ₅	Treatments		Fresh Wt. Lbs/Ac	Dry Forage Lbs/Ac			Relative Yield Total as % of Check
	P Material	Lime		Clover	Grass	Total	
None	None	0	5494	100	1480	1580	100
None	None	L	6394	200	1774	1972	125
100 P ₂ O ₅	250 CSPA	0	6948	438	1660	2096	133
"	500 Super	0	6978	540	1700	2236	142
"	250 CSPA	L	8124	518	1920	2438	154
"	500 Super	L	8018	642	1774	2418	153
200 P ₂ O ₅	500 CSPA	0	7068	528	1662	2212	140
"	1000 Super	0	7148	540	1596	2138	135
"	500 CSPA	L	6818	426	1652	2068	131
"	1000 Super	L	7450	638	1706	2342	148
400 P ₂ O ₅	1000 CSPA	0	7900	522	1910	2432	154
"	2000 Super	0	7372	520	1734	2254	143
"	1000 CSPA	L	8228	464	1924	2390	151
"	2000 Super	L	8420	608	2086	2694	171

EFFECT OF P+S RATE AND SOURCE AND LIME ON RANGE FORAGE

Stanislaus-Calaveras-----April 22, 1969

P ₂ O ₅	Treatments		Fresh Wt. Lbs/Ac	Dry Forage Lbs/Ac			Relative Yield Total as % of Check
	P Material	Lime		Clover	Grass	Total	
None	None	0	7585	333	1620	1954	100
None	None	L	9298	497	1688	2184	111
100 P ₂ O ₅	250 CSPS	0	12812	988	1614	2602	133
"	500 Super	0	13335	996	1674	2803	143
"	250 CSPS	L	13631	1185	1404	2590	132
"	500 Super	L	14427	1352	1248	2600	133
200 P ₂ O ₅	500 CSPS	0	13689	1152	1545	2697	138
"	1000 Super	0	14398	1249	1548	2797	143
"	500 CSPS	L	15821	1581	1249	2831	144
"	1000 Super	L	15733	1586	1302	2888	132
400 P ₂ O ₅	1000 CSPS	0	13943	1084	1849	2933	150
"	2000 Super	0	16088	1350	1733	3082	157
"	1000 CSPS	L	15914	1392	1563	2945	150
"	2000 Super	L	16425	1450	1672	3071	157

EFFECT OF P+S RATE AND SOURCE AND LIME ON RANGE FORAGE

Stanislaus-Calaveras Grove Yields, April 23, 1971

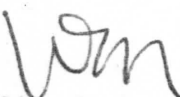
Treatments			Fresh Wt. Lbs/Ac	Dry Forage Lbs/Ac			Relative Yield Total as % of Check
P P ₂ O ₅	Material	Lime		Clover	Grass	Total	
None	None	0	6265	787	817	1604	100
None	None	L	5404	807	559	1365	85
100 P ₂ O ₅	250 CSPS	0	6350	810	812	1622	101
"	500 Super	0	6906	915	884	1799	112
"	250 CSPS	L	5764	870	603	1468	92
"	500 Super	L	6671	1011	579	1590	99
200 P ₂ O ₅	500 CSPS	0	6390	801	931	1732	108
"	1000 Super	0	6681	832	1143	1767	110
"	500 CSPS	L	7292	1128	640	1638	102
"	1000 Super	L	7207	1084	578	1791	112
400 P ₂ O ₅	1000 CSPS	0	6465	712	1021	1733	108
"	2000 Super	0	8203	944	946	1885	118
"	1000 CSPS	L	7963	1122	790	1911	119
"	2000 Super	L	7882	1165	725	1891	118

WJ Berry

UNIVERSITY OF CALIFORNIA
AGRICULTURAL EXTENSION SERVICE

Date: September 8, 1967
To: Jewell L. Meyer, Farm Advisor, Stanislaus County

DAVIS, CALIFORNIA

From:  William E. Martin and Lester J. Berry
Title: Ext. Soils Specialist Ext. Range Specialist
Re:

We are enclosing the yield data from the "clover" fertilizer plot carried out at the Dolling Range this year. You will note that we have put quotes around the word "clover," since clover was our intention and not the ultimate results. This plot was one of the most interesting of the entire series. Yield data from this plot are summarized on the two attached sheets. We obtained very different results in yield of fresh material harvested per acre than we did in yield of dry material for the corresponding treatments. This was due to rather striking differences in the percent dry matter or succulence of the vegetation at time of cutting. The data have been put through the Riverside computer and the following are the salient facts that come from the computer and our interpretation.

- (A) The fresh weight yields were increased primarily by the nutrient sulfur. There was no effect of phosphorus alone and a slight increase in yield from phosphorus if applied with sulfur. The data show an excellent response to sulfur with or without phosphorus. Sulfate was much better than sulfur with or without phosphorus. Early applications of the nutrient sulfur were better than late applications. Late applied elemental sulfur was poor with or without phosphorus.
- (B) The percent dry matter figures show that the material varied considerably in succulence with highly fertilized plants which had received sulfate, much lower in solids than plants receiving elemental sulfur or no sulfur. This increased succulence with sulfate appears to have been associated with the large amount of vetch stimulated by early or late sulfate applications.
- (C) The yield of dry material at this location showed much less difference than had been observed on the fresh material as cut. There was a significant effect of the nutrient sulfur with or without phosphorus. There was no significant difference due to source or time of applying the nutrient sulfur at this location. The large yield differences noted in the fresh harvest were about eliminated when percent dry matter was taken into account. Insofar as we can see when we look at the dry matter yields, there was no significant effect at all of phosphorus.

I think you will find it quite enlightening to look at the sulfur analysis of the grab samples which we took from this plot. These show that the elemental sulfur was a relatively poor source of sulfur at this location, and that the total sulfur and sulfate sulfur in the harvested forage was only little affected by elemental sulfur and very greatly affected by the soluble sulfate in gypsum or normal superphosphate.

It is really interesting that at this site where Bill Williams did his sulfur experiments, elemental sulfur appears to be very slow to react. It is fortunate that his studies were carried out with soluble sulfate.

In summary, I believe we can state that sulfur as a nutrient is the first and only limiting factor at this location. Neither phosphorus nor molybdenum did anything. I think some time we may wish to take a look sometime at the foraging power of clovers in contrast to vetch, since the vetch at this location served to confuse and confound us. We will certainly wish to observe this plot next year and would hope that by then it would be grazed completely so that we will not have a bunch of dead vegetation to contend with.

We are enclosing for your information summaries of the other clover fertilizer plots carried out in our statewide program this season. We hope you will find these interesting and would appreciate it if you would release locally only results of your own plot as we would like to gather together the statewide results in a single publication a year hence.

WEM:gl

Encs.

cc: W. E. Mason
James Street

TIME & SOURCE OF P & S: FIRST SEASON RESULTS

County: Stanislaus

Date applied: E 11/2/66 L 2/2/67

Cooperator: Dolling

Date harvested: 5/15/67

Material & Rate	Material & Time Applied	Yield Fresh Wt. Lbs./Ac.	Percent Dry Matter	Yield Dry Wt. Lbs./Ac.	Yield as Percent of Untreated
1. None	--	18152	24.25	4404	100
2. 187 lbs. TSP	P _E	19754	23.10	4560	104
3. TSP	P _L	18117	25.50	4545	103
.....					
4. 300 lbs. Gypsum	SO _{4E}	26478	19.90	5203	118
5. 500 lbs. SSP (0-21-0-12 SO ₄ S)	P _E SO _{4E}	30711	18.35	5409	123
6. Gypsum + TSP	P _L SO _{4E}	37192	16.50	6123	139
.....					
7. 50 lbs. Elemental S	S _E	22385	23.15	5142	117
8. 250 lbs. TSPS (0-40-0-20 S)	P _E S _E	29510	22.00	6351	144
9. E1. S + TSP	P _L S _E	22907	24.45	5587	127
.....					
10. Gypsum	SO _{4L}	27437	23.10	6393	145
11. TSP + Gypsum	P _E SO _{4L}	31147	17.00	5277	120
12. SSP	P _L SO _{4L}	32157	18.15	5841	133
.....					
13. E1. S	S _L	22054	23.55	5196	118
14. TSP + E1. S	P _E S _L	22140	23.00	5033	114
15. TSPS	P _L S _L	20956	22.40	4679	106
.....					
16. TSPS + Mo	P _E S _E Mo	24231	22.15	5325	121
L.S.D. (between individual treatments)		5609	6.09%	1697	±39
Coefficient of Variation		10.3%	13.0%	14.3%	
Major Response		S PS	S	S	

Dolling - Stanislaus 1967

Fresh Wt. Lbs./A. Yield	No P	P _E	P _L	Σ
No S	18152	19754	18117	56073
S _E	22385	29510	22907	74802
S _L	22054	22140	20956	65150
SO _{4E}	26478	30711	37192	94381
SO _{4L}	27437	31147	32157	90741
Σ	116506	133262	131329	

5
50"

% Dry Matter	No P	P _E	P _L	Σ
No S	24.25	23.16	25.50	72.91
S _E	23.15	22.00	24.45	69.60
S _L	23.55	23.00	22.40	68.95
SO _{4E}	19.90	18.35	16.50	54.75
SO _{4L}	23.10	17.00	18.15	58.25
Σ	113.95	103.51	107.00	

50"

Dry Matter Lbs./A. Yield	No P	P _E	P _L	Σ
No S	4404	4560	4545	13509
S _E	5142	6351	5587	17080
S _L	5196	5033	4679	14908
SO _{4E}	5203	5409	6123	16735
SO _{4L}	6393	5277	5841	17511
Σ	26338	26630	26775	

DOLLING FORAGE

SO₄-S
Total S

	P _O		P _E		P _L	
	<u>SO₄-S</u>	<u>Total S</u>	<u>SO₄-S</u>	<u>Total S</u>	<u>SO₄-S</u>	<u>Total S</u>
SO	240	488	390	559	250	584
	270	1079	240	533	240	538
SE	280	665	520	858	290	580
	240	628	330	676	210	644
				777 ^{mo} 400 635 ^{mo} 290		
SL	460	575	370	715	310	577
	240	635	260	658	230	568
SO ₄ E	790	1058	890	1329	900	1221
	480	1127	720	1173	590	1463
SO ₄ L	800	1178	660	1295	940	1254
	610	1164	770	1157	660	1159