UNIVERSITY OF CALIFORNIA
AGRICULTURAL EXTENSION SERVICE

DAVIS, CALIFORNIA

Date: May 31, 1962
To: Lin V. Maxwell
Farm Advisor - Tehama County

From: W. E. Martin
Title: Extension Soils Specialist
Re:

Enclosed are the yield figures that Jim Street gave me of your experiment. I have indicated in the top half the yield of the small plots without nitrogen, and below, the second half of the experiment, yield with nitrogen. I have indicated separate LSD for the two halves of the experiment.

WEM:maj

cc: Jim Street

Enclosure

Yield of "Cut" Vegetation

Tehama County — Street & Maxwell

Treatment	Rep I	Rep II	Rep III	Sum of 3 Reps	
Check	50	30	65	145	LSD 167
S72	125	40	30	195	
P160	140	95	30	265	
PS	220	105	115	440	
N_{100}	580	770	750	2100	LSD 766
NS	425	610	685	1720	
NP	1320	1235	930	3485	
NPS	1290	1365	1190	3845	

(2)

DRY MATTER YIELD COMPARISONS AND COSTS OF RANGE FERTILIZATION OVER A 4-YEAR PERIOD - REHSE RANCH

Harvest year	Control Yield Lbs DM/Acre	Control Yield %	Fertilizer Treatments[1] and Year Applied: 100 S 1965 %	200 S 1965 %	300 PS 1965 %	300 NS 1965 %	300 NS 1967 %	300 NS 1967 1968 %
1965	5278	100[a]	101[a]	97[a]	114[b]	149[c]	-	-
1966	2641	100[a]	109[ab]	98[a]	150[c]	131[bd]	-	-
1967	5664	100[a]	120[ab]	128[abc]	127[abc]	131[bc]	147[c]	147[c]
1968	5276	100[b]	116[cd]	119[de]	123[e]	95[a]	113[c]	140[f]
Total	18,859	100	110	113	126	126	121	127
Cost of material per acre[2]		0	$3.60	$7.80	$8.15	$8.00	$8.00	$16.00
Cost per ton of increased forage								
1965			$102.80	no inc.	$21.58	$6.16	-	-
1965 - 66			$23.84	no inc.	$7.86	$4.68	-	-
1965-66-67			$4.20	$15.18	$4.47	$3.09	$5.15	$5.15
1965-66-67-68			$3.96	$6.50	$3.39	$3.28	$3.98	$6.33

[1] Treatments:

100 S = 100 lbs. per acre beaded elemental sulfur 95% coarser than 100 mesh
200 S = 200 lbs. per acre beaded elemental sulfur
300 PS = 300 lbs. per acre single super phosphate
300 NS = 300 lbs. per acre ammonium sulfate

[a,b,c,d,e,f] Yields in the same year bearing different superscript letters are significantly different ($P < .05$).

[2] Cost includes $1.00 per acre application cost. ASC payment not deducted.

Tehama County Farm Advisors Office
Box 370, Red Bluff, Ca 96080
Kenneth W. Ellis, Farm Advisor

SULFUR FERTILIZATION - MILLER RANCH

One hundred pounds per acre of elemental sulfur was applied to 1,300 acres of range on the Miller Ranch west of Red Bluff in the early fall of 1965. Soils in the fertilized area are predominantly Naciemiento, Newville and Dibble. The area is in the "bald hill" belt of rangeland and is considered "bur clover" country. No forage clippings were taken in the spring of 1966, a very poor range year, and no visible response was apparent.

Exclosures were established in the fall of 1966 and the following forage figures are taken from these exclosures (using the square foot sampling method) and extended to a per acre basis. Exclosures were established on top of the hills as well as in the swales in both the fertilized and control fields. One half of each exclosure area has been completely cleaned or clipped each year with the remaining half not cleared of old forage growth. This plan was established to study the effect of complete forage removal (overgrazing) compared to undergrazing or no use at all.

Figures are pounds of air dry forage per acre.

	Fertilized		Unfertilized	
	1967	1968	1967	1968
Hill (not clipped)	8,240.1	6,295.8	5,172.7	4,083.7
Swale (not clipped)	6,960.5	5,785.3	7,387.0	3,743.4
total	15,200.6	12,081.1	12,559.7	7,827.1
average	7,600.3	6,040.5	6,279.85	3,913.5
Hill (clipped)	6,316.2	5,104.7	4,468.9	3,062.8
Swale (clipped)	5,481.3	6,636.1	4,346.9	3,403.1
total	11,797.5	11,740.8	8,811.8	6,465.9
average	5,898.75	5,870.4	4,405.9	3,232.9

Summary:

1967

- Combined average of hill and swale samples (not clipped) indicated a 21% increase in forage in the fertilized field.
- Combined average of hill and swale samples (clipped) indicated a 33.88% increase in forage in the fertilized field.
- Combining the weights of all four samples from each field indicated a 26.3% advantage from the fertilized field.

1968

- Combined average of hill and swale samples (not clipped) indicated a 54.3% increase in forage in the fertilized field.
- Combined average of hill and swale samples (clipped) indicated an 81% increase in forage in the fertilized field.
- Combining the weights of all four samples from each field indicated a 66.66% advantage from the fertilized field.

TOTAL ESTIMATED FORAGE DIFFERENCES

	1967	1968	
Fertilized (not clipped)	15,200.6	12,081.7	
Unfertilized (not clipped)	12,559.7	7,827.1	
	2,640.9	4,254.6	6,895.5 total extra forage two seasons
Fertilized (clipped)	11,797.5	11,740.8	
Unfertilized (clipped)	8,811.8	6,465.9	
	2,985.7	5,274.9	8,260.6 total extra forage two seasons

Cost of sulfur at time of application, September, 1965 $50.00 per ton or $2.50 per acre

Cost of air application 1¢ per pound or 1.00 per acre

Total cost applied --- $3.50 per acre

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Date applied Early - 11/18/66 Late - 2/11/67 Date harvested - 5/22/67*
Fertilizer applied to an existing stand of rose clover

	Material and Rate	Element and Time Applied	Yield dry wt. #/acre	Yield as % of control	1967 # forage/acre over check	Cost of fertilizer and application
13.	50 # elemental sulfur	Sulfur late	3,051	84%	-562	$1.50 + 1.00 = $2.50
14.	187# treble super 50# elemental sulfur	Phosphate early Sulfur late	4,826	133%	1,213	$7.91P 1.50S $9.41 + 1.00 = $10.41
15.	250# golden triple phosphate	Phosphate late Sulfur late	5,235	144%	1,622	$11.00 + 1.00 = $12.00
16.	250# golden triple phosphate plus Molybdenum	Phosphate early Sulfur early Mo early	5,931	164%	2,318	$12.00 + 1.00 = $13.00

*not harvested in 1968

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RANGELAND COSTS - TEHAMA AND SHASTA COUNTIES

by Ken Ellis
Farm Advisor, Tehama County

Walter Johnson
Farm Advisor, Shasta County

The costs of owning and maintaining rangeland, within the same political subdivision, vary with the acreage involved, its productivity level and the number of livestock carried on the range. Current rangeland prices may not necessarily reflect productive value or income producing potential from agricultural use. The location, possible use for subdivision or recreation and/or certain tax advantages prompts individuals and companies other than ranchers to invest in rangeland. Actual rental or lease values on today's market tend to reflect the annual costs of rangeland minus interest on investment. The interest on investment charges in this cost study are computed on a no equity basis.

If ranches with the same acreage but different levels of productivity are considered, the investment in buildings, corrals, fences and equipment would be higher per acre for the more productive range since more cattle can be carried. More acres of the lower producing range are required to carry each animal unit, therefore the investment in buildings, corrals, and equipment would be less per acre. Fences, maintenance costs, depreciation and insurance would also be less per acre but higher per animal unit.

The figures presented in this cost study are examples. Each rangeland owner may need to adjust certain costs to fit varying situations.

Section I

This first section illustrates the basic requirements in acres and the value of fences, buildings, corrals and other equipment to maintain 100 animal units for the normal winter grazing season (November or December through May) for three ranges of different productive capacity. When stock is carried year round the number of acres required per animal unit is greatly increased.

	Productive Level		
	High	Medium	Low
Acres per animal unit*	7	15	25
Acres per 100 animal units	700	1,500	2,500
Fence, miles (4 fields)	6.3	9.2	12.0
Fence value @ $1,200 mile	$7,500	$11,040	$14,400
Building, corrals, scales, etc.	$8,000	$8,000	$8,000
Repairs and maintenance per unit	$300	$400	$500

*One animal unit = one 1,000 pound mature cow. Rule of thumb for sheep is 5 ewes = 1 animal unit.

Section II

The table below illustrates the yearly costs of owning and maintaining rangeland per acre at the three productive levels stated in section I. No improvement practices are considered. The purchase price per acre in this table includes fences plus barn, other buildings (not including dwelling) and minimum corrals for handling stock.

	Productive Level		
	High	Medium	Low
Investment (including land, fences, corrals, buildings and equipment)	$100.00	$60.00	$35.00
Annual Costs			
Interest on investment @ 6.5%	$6.50	$3.90	$2.28
Taxes ($7 rate on taxable value)	$1.75	$1.05	$ .61
Depreciation on fences (20 years)	$ .54	$ .37	$ .29
Depreciation on other improvements (20 years)	$ .57	$ .27	$ .16
Repairs and maintenance (fences and roads)	$ .43	$ .27	$ .20
Liability Insurance	$ .06	$ .04	$ .03
Fire insurance on buildings and corrals	$ .13	$ .06	$ .04
Total yearly costs per acre	$9.98	$5.96	$3.61
Total range costs per 100 cow* unit	$6,986.00	$8,940.00	$9,025.00

*or 500 ewes

Acknowledgment and appreciation to Philip S. Parsons, Agricultural Extension Economist, and Tehama and Shasta County ranchers assisting in compiling costs and values.

GLENN (16)

AUG 1 1 Rec'd

UNIVERSITY OF CALIFORNIA
AGRICULTURAL EXTENSION SERVICE

607 Fifth Street
Orland, California
Telephone: UNderhill 5-4487

August 10, 1965

Mr. Vernon Rehse
Star Route, Box 42
Orland, California

Dear Vernon:

Enclosed is a table showing the results of our fertilizer test and some estimates of the dollars and cents involved.

The unfertilized and the sulfur-fertilized plots yielded a little over 2½ ton to the acre compared to 3 ton for the single superphosphate and a little under 4 ton for the ammonium sulfate. There was no difference between the unfertilized and the elemental sulfur treatments. The single superphosphate increased the yield 14% and the ammonium sulfate 49%.

Figuring the cost of the fertilizer at $8.15 applied for the single super and $8.00 for the ammonium sulfate, the extra feed cost $21.59 a ton from the single super and $6.16 a ton for the ammonium sulfate.

If we arbitrarily figure that the land would rent for $4.00 an acre, then the cost per ton of feed would be about $1.50 for the unfertilized, $2.85 for the elemental sulfur, $4.50 for the 200 lbs. of elemental sulfur, $4.00 for the single super and $3.00 for the ammonium sulfate.

If we estimate the check would yield 40 lbs. of beef per acre, then the single super should give 114% times that or 46 lbs., and the ammonium sulfate 60 lbs. Dividing the pounds by the total cost, including "rent", the cost would be 10¢ a pound on the control, 19¢ for the 100 lbs. of sulfur, 30¢ for the 200 lbs., 26¢ for the single super and 20¢ for the ammonium sulfate.

These estimates do not take into account the fact that the feed fertilized with single superphosphate or ammonium sulfate is higher in protein and better in quality and also grew faster and, therefore, was available to the cattle earlier. Also, we are figuring the total yield clipped all the way to the ground. Here again we do not give full credit to the fertilized plots because a greater percent of the heavier yielding plots would be available to cattle compared with the lower yielding plots. Also because fertilizer increases the palatability, probably more of the fertilized feed would be eaten than that which was not fertilized.

Sincerely yours,

Monte Bell

Monte Bell
Farm Advisor

MB:LP
cc: James E. Street
Ken Ellis

REHSE FERTILIZER PLOT
Applied January 13, 1965

	1	2	3	4	5	6	7
Treatment	None	100 E.Sulf.	100 E.Sulf.	100 E.Sulf.	200 E.Sulf.	300 SSP	300 Am.Sulf.
Cost/acre applied	0	$3.60	$3.60	$3.60	$7.80	$8.15	$8.00
"Rent"	$4.00	$4.00	$4.00	$4.00	$4.00	$4.00	$4.00
Feed cost/acre	$4.00	$7.60	$7.60	$7.60	$11.80	$12.15	$12.00
Yield lbs./acre	5278	5264	5327	5454	5138	6033	7875
	----------no difference----------						
% of check	100	100	100	100	100	114	149
Lbs./acre increase	----------					755	2597
$/ton extra feed						$21.59	$6.16
$/ton feed	$1.52	$2.88	$2.85	$2.79	$4.59	$4.02	$3.04
Est. beef/acre	40 lbs.	40 lbs.	40 lbs.	40 lbs.	40 lbs.	46 lbs.	60 lbs.
$/lb. beef	10¢	19¢	19¢	19¢	30¢	26¢	20¢