

Bill Weitkamp
 Farm Advisor
 San Luis Obispo County

1970-71 RANGE FERTILIZER TRIALS

A) Pete Tognazzini Ranch, Cayucos
 Fertilizer applied 11-25-70, fenced 1-8-71, clipped 5-5-71

Trial I was a 12-foot-square enclosure with 4-foot-square plots.
 Trial II was a 20-foot-square enclosure with 10 ft. x 6 ft plots.

<u>Trial</u>	<u>Treatment</u>	<u>Fert Rate per Ac., lbs.</u>	<u>Dry Forage Per Acre Pounds</u>	<u>Ave. Yield & Fert. Cost per Acre</u>	<u>Lbs. N Applied per Ac</u>	<u>Approx. Cost Per Ton of Extra Forage</u>
I and II	Check	--	5009	--	0	
I and II	Urea	142 } ave. = 180 } <u>161 lbs/ac</u>	7093 } 4933 }	<u>6013 lbs.</u> \$8.05/acre	64 81	\$16.04
II	21-0-0-24	200 } ave. =	5868 }	<u>6197 lbs.</u>	42	
I	21-0-0-24	300 } 300 lbs/ac	6872 }	\$8.70/acre	63	\$14.65
II	21-0-0-24	400 }	5851 }		84	
II	16-20-0-15	250 } ave. =	5732 }	<u>6651 lbs.</u>	40	
I	16-20-0-15	400 } <u>383 lbs/ac</u>	6787 }	\$15.70/acre	64	\$19.12
II	16-20-0-15	500 }	7433 }		80	

* * * * *

B) Next to Farm Advisor's Office, San Luis Obispo
 Fertilizer applied 1-23-70, clipped 4-14-71
 Four-foot-square plots
 Average of two replications:

<u>Treatment</u>	<u>Rate Per Acre lbs.</u>	<u>Dry Forage Per Acre lbs.</u>	<u>Extra Forage Produced Per Acre, Pounds</u>	<u>Approx. Fert. Cost Per Acre</u>	<u>Approx. Cost Per Ton of Extra Forage</u>
Check	0	1853	--	--	--
Urea	142	3530	1677	\$ 7.10	\$ 8.47
21-0-0-24	300	3940	2087	8.70	8.34
16-20-0-15	400	4631	2778	16.40	11.81

1971-72 RANGE FERTILIZER GRAZING TRIAL
 Pete Tognazzini Ranch, Cayucos

WEIGHT GAINS

FERTILIZED FIELD		CONTROL FIELD			
400 lbs. per acre of 21-0-0 on about 120 acres		Purchased Heifers		Tognazzini Replacements	
No. Head	66	No. Head	46	3	14
Days grazed	137	Days grazed	128	111	116
Ave. initial wt. (12/21/71)	^{32¢} 446.7	Ave. initial wt. ^{34¢} 393.0 (12/30)	^{34¢} 418.3 (1/16)	^{31¢} 486.1 (1/11)	
Ave. final wt. (5/6/72)	^{32.10¢} 664.9	Ave. final wt. @ ^{32.10¢} 572.0 (5/6/72)	585.0	709.6	
Ave. gain	218.2	Ave. gain	179.0	166.7	223.5
Total gain	14,405	Total gain	8,235	500	3,130
ADG per head	1.59	ADG per head	1.40	1.50	1.93

14,405

ADG FOR 63 HEAD = 1.55 LBS.

COST AND INCOME ANALYSIS

Range Fertilizer Grazing Trial
December 21, 1971 to May 6, 1972
Pete Tognazzini Ranch, Cayucos

by

Bill Weitkamp

FERTILIZED FIELD - 202.8 TOTAL ACRES		CONTROL FIELD - 245.6 TOTAL ACRES	
Fertilizer cost (120 acs. @ \$11.10/ac) 400 lbs. 21-0/ac	\$ 1,332.00		
Rent cost (202.8 acs. @ \$9.50/ac)	1,926.60	Rent cost (245.6 acs. @\$9.50)	\$ 2,333.20
Cattle cost @32¢/lb	9,434.04	Cattle cost @ 32¢/lb	8,364.24
Total cost (does not include interest)	\$12,694.80	Total cost (does not include interest)	\$10,697.44
Total income (43,885 lbs @ 32.10¢)	\$14,087.08	Total income (38,005 lbs @ 32.10¢)	\$12,199.60
Net income	\$ 1,392.28	Net income	\$ 1,502.16
Net income per acre \$1,392.28 ÷ 202.8 acs	\$ 6.87	Net income per acre \$ 1,502.16 ÷ 245.6 acs.	\$ 6.12
Cost per pound sold \$12,694.80 ÷ 43,885 lbs	28.93¢	Cost per pound sold \$10,697.44 ÷ 38,005 lbs	28.15¢
Cattle value increase \$4,653.04 ÷ 14,405 lbs per pound gain	32.30¢	Cattle value increase \$3,835.36 ÷ 11,865 lbs per pound gain	32.32¢

RANGE FERTILIZER GRAZING TRIAL
 December 21, 1971 to May 6, 1972
 Pete Tognazzini Ranch, Cayucos
 by
 Bill Weitkamp

	<u>Fertilized</u>	<u>Control</u>	
Acres brush and trees	10.2	18.0	
Acres good range	107.2	142.9	
Acres rocky range	85.4	84.7	
Total acres grazed	192.6	227.6	
Total lbs. beef produced	14,405	11,865	(14,405)
Lbs. beef/graazed acre	74.8	52.1	(63.3)
\$ Income/graazed acre @33¢ ³⁴	\$24.68 ¹⁶	\$17.19 ^{16.53}	(\$20.85) ⁹⁵
\$ Difference/acre	\$7.49 ³³	16.53	(\$3.79)
Fertilizer cost @\$11.10/ac.	\$1,332.00 (120 acs.)	0	62

1) Assumption: Good range and rocky range produce equally without fertilizer.

$$7.42 \times 192.6 \text{ acs.} = \$1,442.57 \text{ return from fertilizer}$$

2) Assumption: Rocky range production = 50% good range production without fertilizer.

<u>Fertilized</u>		<u>Control</u>	
107.2 acs. x 108.9 lbs. = 11,672		142.9 acs. x 64.07 lbs. = 9,155	
85.4 acs. x 32.0 lbs. = <u>2,733</u>		84.7 acs. x 32.0 lbs. = <u>2,710</u>	
14,405 lbs.		11,865 lbs.	

$$\begin{array}{r} 108.9 \\ -64.1 \\ \hline \text{Difference} = 44.8 \text{ lbs.} \end{array} \quad \begin{array}{l} 32.34 = 47 \\ @33\text{¢} = \$14.70 \end{array}$$

$$107.2 \text{ acs.} \times \$14.70 = \$1,584.42 \text{ return from fertilizer}$$

3) Assumption: Rocky range production = 50% good range production without fertilizer and total weight gains on the two fields should have been equal.

<u>Fertilized</u>		<u>Control</u>	
107.2 acs. x 103.5 lbs. = 11,092		142.9 acs. x 77.8 lbs. = 11,115	
85.4 acs. x 38.8 lbs. = <u>3,313</u>		84.7 acs. x 38.8 lbs. = <u>3,290</u>	
14,405 lbs.		14,405 lbs.	

$$\begin{array}{r} 103.5 \\ -77.8 \\ \hline \text{Difference} = 25.7 \text{ lbs.} \end{array} \quad \begin{array}{l} 32.34 \\ @33\text{¢} = \$8.48 \end{array}$$

$$107.2 \text{ acs.} \times \$8.48 = \$908.66 \text{ return from fertilizer}$$

4) Assumption: Good range and rocky range produce equally without fertilizer and total weight gains on two fields should have been equal. (FIGURES IN PARENTHESES ARE)

$$3.79 \times 192.6 \text{ acs.} = \$729.95 \text{ return from fertilizer.}$$

Madera - September 23, 1972

Salesyard, California Livestock Marketing Association (CLMA)

- 9:00 a.m. Registration - inspect bulls
- 11:00 a.m. Physical Traits Evaluation Ken Ellis, Ext. Animal Scientist
(live animal demonstration) Farm Advisors Bill Hambleton and Aaron Nelson
- 11:45 a.m. Bull gain guessing contest; announce winner . . . Bill Hight, Farm Advisor
- 12 Noon Lunch - to be served by Madera County Cowbelles
- 1:00 p.m. Welcome and introductions L.H. McDaniel, CBCIA Vice President
- 1:30 p.m. Bull Sale (bull transportation available from yards by commercial truck).

#

RANGE FERTILIZATION TRIAL RESULTS

1) Mowed Trials

Below are the results of a range fertilizer trial conducted last winter near Edna Road, south of the San Luis Obispo airport. Cooperating with me were Louis and Tom Donati (fence construction and land use) and Lin Maxwell, farm advisor in Santa Barbara County.

The last two columns show that even on a very dry year the response to nitrogen and phosphorus from 16-20-0 application was striking. Some of you observed this trial from the road and noticed the prominent 16-20-0- strips.

Range Fertilizer Trial on Edna Road

10' x 100' strips; fertilizer applied December 1, 1971
Harvested with 3-foot mower March 29, 1972

Fertilizer	Pounds Applied per Acre				Pounds Air-dried Forage per Acre				Percent of Check
	Total	N	P ₂ O ₅	S	Rep. I*	Rep. II*	Rep. III*	Average 3 Reps.	
Urea-45%N	183	80			348	697	682	576	200
Urea-45%N	91	42			653	436	1,220	770	267
Ammonium sulfate	381	80		91	363	799	1,931	1,031	358
Ammonium sulfate	190	40		45	653	436	595	561	195
16-20-0-15	500	80	100	75	1,946	1,035	2,802	1,928	669
16-20-0-15	250	40	50	37	770	857	1,670	1,099	382
Ammonium nitrate 30%N	240	72			1,133	624	1,467	1,075	373
Ammonium nitrate 30%N	120	36			421	639	915	658	228
Single superphosphate	500		100	60	174	290	595	353	123
Single superphosphate	250		50	30	334	290	348	324	112
Check	0				167	355	341	288	100

*Each fertilizer treatment was replicated three times (continued)

RANGE FERTILIZATION TRIAL RESULTS (Continued)

Two other trials, one south of Morro Bay and one south of Cambria, also showed a marked response to 16-20-0 fertilization at the rate of 400 pounds per acre:

Fertilizer	Rate per Acre Pounds	Morro Bay		Cambria	
		Fertilized 11/10/71 Mowed 4/20/72	Percent of Check	Fertilized 11/5/71 Mowed 4/6/72	Percent of Check
16-20-0-15	400	Lbs. Air-dried Forage/ac Ave. 4 reps. 2,136	263	Lbs. Air-dried Forage/ac Ave. 4 reps 1,652	564
Ammonium sulfate	300	1,157	143	340	116
Check	0	811	100	293	100

The other side of the coin, however, is that two other coast trials showed no response to fertilizer because the grass just did not germinate in any of the plots. So, if you plan to fertilize range, give preference to the best fields where if fertilizer doubles present forage production (as it should), the increased income will more than pay for the fertilization.

2) Grazing Trial

Weight records of heifers from December, 1971 to May, 1972 on Pete Tognazzini's ranch near Cayucos showed an increase of 45 pounds of beef per acre from 400 pounds of ammonium sulfate per acre. The average daily gain per head of 66 heifers on the fertilized field (1.59 pounds) was similar to that for 63 heifers on an adjoining unfertilized field (1.55 pounds). The grass was grazed to a similar height in the two fields. A heavier stocking rate in the fertilized field accounted for the 45 pounds greater gain (109 pounds per acre for the fertilized range versus 64 pounds for the control).

Contributors of fertilizer, application, cattle, and other assistance for this trial were Valley Nitrogen Producers, Inc; M.E. Hall, Pete Tognazzini and the San Luis Obispo County Farm Supply.

William H. Weitkamp, Jr.
William H. Weitkamp, Jr.
Farm Advisor

EXTENSION SERVICE
U. S. DEPARTMENT OF AGRICULTURE

UNIVERSITY OF CALIFORNIA
BERKELEY, CALIFORNIA 94720

OFFICIAL BUSINESS
10/70 - 350 copies

Postage and Fees Paid
U. S. Department of Agriculture

FARM AND HOME
ADVISORS' NOTES ON



LIVESTOCK AND RANGE

Les Berry, Ext. Range Specialist
Department of Agronomy Extension
University of California
Davis, California 95616

AGRICULTURAL EXTENSION SERVICE UNIVERSITY OF CALIFORNIA SAN LUIS OBISPO COUNTY

County Airport-Edna Road (P.O. Box 911) San Luis Obispo 93401 Telephone 543-1550, Ext. 241

DOES RANGE FERTILIZATION PAY?
RANGE SEEDING
HARDINGGRASS-CHEAPER THAN HAY

sulfur are not reliable indicators of the availability of these elements to plants. We assume that range plants will respond to nitrogen fertilizer unless a good stand of inoculated, nitrogen-fixing legume is present. A plant analysis for sulfur will tell us if this element is needed.

DOES RANGE FERTILIZATION PAY?

The answer is not a definite yes or no. It depends on many things. A proper fertilization program, however, will usually pay on ranges with 10 to 30 inches of annual rainfall.

You can also fence a small area and conduct a simple "exploratory" test for nitrogen, phosphorus and sulfur -- for instructions contact my office. Fencing the plot is a must since heavy grazing of fertilized plants will destroy the results.

Here are some important considerations for the rancher who would like to increase profits through fertilization:

Test for deficiencies: This can be done with analytical soil and plant tests by a commercial laboratory. The soil should be tested for phosphorus and for potassium. Soil tests for nitrogen and

I recommend that both the laboratory tests and the test plot be used because accurate answers will save you money. Suppose, for example, you learn that your forage will respond to the application of sulfur, but not phosphorus. Then, you would apply 300 pounds of

ammonium sulfate (20-0-0-24)*. If you had wrongly assumed that your range needed phosphorus, you would apply 400 pounds of ammonium phosphate sulfate (16-20-0-15), a more expensive fertilizer. The cost per acre of the 16-20-0-15 fertilizer would be almost twice as high as for the ammonium sulfate. The results would be similar, however, because the amounts of nitrogen and sulfur in the two applications would be almost the same.

Even a soils expert can not tell you which fertilizer to apply unless he has the results of a soil and plant laboratory test or a test plot to interpret. So, for fields you are planning to fertilize this fall have a laboratory run a soil test now. On fields you plan to fertilize in future years, begin a test plot now. Contact the Farm Advisors Office for information about these methods and plant analyses.

Fertilize before the first good rains. A big advantage of range fertilization is the earlier production of green feed. So apply the material in time to do the most good.

Don't skimp on the amount. Apply 60 to 80 pounds of actual nitrogen per acre. Apply phosphorus and/or sulfur in about the same amounts if they are required. Research has shown it is like swapping dollars to put on light rates of these elements. If you are sticking to a budget, decrease the acreage fertilized rather than the rate applied.

Don't fertilize the same native grass range year after year, or weed species will become predominant. Applying nitrogen fertilizer every four years to the same field appears to give the best results. Fertilizing one-fourth of the acreage each year makes it easier to adjust cattle numbers to the forage production than if the entire acreage is fertilized every fourth year.

Grazing the fields in the same growing season the fertilizer is applied. Stock enough animals to take advantage of the extra forage produced.

*These numbers stand for percentages of the elements nitrogen, phosphorus potassium and sulfur.

RANGE SEEDING

If you are thinking of seeding annual clovers on dryland range this fall, the attached Farm Advisor Fact Sheet can help you avoid some common pitfalls.

###

HARDINGGRASS - CHEAPER THAN HAY

Davis -- That old range standby, *Hardinggrass*, is getting new attention these days as livestock operators discover its potential for supplying cattle forage during the critical, feedshort early winter.

Stands of *Hardinggrass*, say University of California range specialists, can supply the equivalent of from one to five bales of hay per acre, starting as early as November and going through February, when annual grasses begin to produce.

"This is a good year to get into *Hardinggrass*," says James E. Street, UC range technologist at Davis. "The seed supply is abundant and the price is down considerably.

Even better news is on the horizon. New varieties. Street reports that two new varieties, *Perla* and *Sirocco*, will yield 30 per cent more winter feed than standard *Hardinggrass*. A considerable amount of *Perla* seed should be available in another season or two.

"The true value of *Hardinggrass*," says Street, "is its early and abundant feed, months ahead of annual grasses."

The plant survives the hot summer months by going dormant. It then breaks this dormancy in the fall by drawing on stored energy in the established root system to start regrowth even before fall rains.

University recommendations are that *Hardinggrass* be planted with annual legumes, such as sub and rose clover or bur clover. However, *Hardinggrass* does not do well on shallow, hardpan or claypan soil, or with less than 15 inches of precipitation.

William H. Weitkamp Jr.
William H. Weitkamp, Jr., Farm Advisor
San Luis Obispo County