

Jan. 30, 1970 REPORT OF PLANNED WORK ACCOMPLISHED*

Period covered by
this report:

NAME(S) Irving Grover LOCATION Napa

From Jan. 1, 1969

PROJECT
PLAN TITLE Increase Forage Production by Legumes on Dryland Pasture

To Dec. 31, 1969

Project Number	4	Primary Subject	A 65	Secondary Subject		Commodity	F 12
State Project Reference	SW 211	Audience Type	10	Research Involved	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Status	Continuing <input type="checkbox"/> Terminated <input checked="" type="checkbox"/>

Copies to Benson, Harwood, Berry, Martin

INCLUDE IN THIS REPORT: Procedures used; results obtained (including specific changes brought about in knowledge, skills or attitudes, economic benefits or other results);** technical results where applicable (detailed technical results should be attached to this report and sent to appropriate specialist(s); evaluation of effectiveness of work done and degree to which goals were reached. (Attach additional pages if needed.)

** Cite specific examples including degree of acceptance or use of knowledge or practices taught.

Procedures Used: The forage from each plot [except plots 2,4,5 and 6 in replication III which were drowned out) was cut with a powered 3-foot wide sickle mower on April 10 and 14, 1969. A grab sample of the freshly cut forage was taken in each plot at approximately 6-foot intervals immediately after cutting and before the forage was raked up. The grab samples from each plot were placed in plastic bags as gathered, sealed to hold in the moisture, and taken to the laboratory in Davis. In the lab the forage from each plot was separated into two lots, subclover and all other forage and the two fractions weighed after drying. Also for each sample, a percent of dry matter determinations was made.

Late in the spring, this test area was included as one of three stops in a range improvement tour held for ranchers. Results from the laboratory were not received in time for the tour so only the previous year's results could be presented.

Results Obtained: Information derived from this test was prepared for popular consumption and made public through news stories and in the commodity letter "The Forager".

In the following tabular material, the 1969 results are compared with those of the previous year, Table 1, Parts A and B). Also an attempt is made in Table 2 to evaluate the production of livestock feed in terms of nutrients produced. Admittedly, these latter comparisons can be questioned because they are based on assumptions that could be invalid. However, there being no better data available, these data are presented. The following is explanatory and constitute a justification. "Morrison's Feeds and Feeding" tables for dry roughages gives no values for subterranean clover. This source does, however, give values for bur clover and I used these in lieu of the Lacking subclover values. For the indigenous vegetation growing with the subclover I averaged the Morrison values for chess and filaree. These average values I used in calculating the feeding values for the fraction of forage other than subclover. The dry weight values determined by the Davis laboratory were increased to hay weight by using dry matter factors for the forages mentioned above in the Morrison tables. In spite of the fact that these assumptions are not entirely valid, I believe the resulting calculations give as close a representation of the feeding value of the forage produced in 1968 and 1969 under the several treatments as would be possible without analysis of the forage to determine the actual digestible protein and total digestible nutrient content. The value of the feeding values (Table 2) are that they combine the two fractions of the forage into an entity that more nearly represents the values for which the pasture is being managed.

* Report on all work completed during the period covered by the project plan within 30 days after end of period covered, or in any case not later than June 30 for all plans ending December 1 to June 1, and by December 31 for all plans ending between June 1 and December 1. If the project is not completed, continue the plan and report rest of results during the next reporting period.

A report will be submitted on each reportable project plan as outlined above.

Complete sets of raw data and other tables are not included here but are being attached to the copies sent to the specialists.

Summary and Conclusions: Weather conditions for range and pasture growth were very much more favorable in 1969 than in 1968. This marked difference tends to mask trends which would otherwise be more evident. With this in mind, the following statements are made.

1. In terms of pounds of total forage produced, those treatments that responded least in 1968 showed the marked production improvements in 1969. This is a weather factor.
2. Those treatments that made the greatest response to fertilizer in 1968 just barely held their own in 1969. Since the weather was more favorable, this would indicate a rapid loss carry over effect the second year as compared with the first.
3. In spite of a reduced response, those treatments that responded most in 1968, were markedly ahead of the other treatments and the check in 1969, thus continuing to show a real continuing value for fertilization with Palone and with a combination of P and K.
4. As might be expected, clover production dropped more rapidly than did total forage production in those treatments showing response to phosphorous and potash. The two treatments containing both P and K, however, showed a slight increase in the clover production as a percentage of the check.

Table 1

Part A - Dry Weight of Vegetation Produced in 1968 and 1969

Treatment		1968		1969		1969 Production as a % of 1968
No.	Description*	Lbs. Per Acre	% of Check	Lbs. Per Acre	% of Check	
1	K	663	93.8	998	97.3	150.5
2	TSP	2,444	345.7	2,733	266.4	111.8
3	TSP+S	2,741	387.7	2,214	215.8	80.8
4	SSP	2,456	347.4	2,517	245.3	102.5
5	TSP+S+Mo	2,239	316.7	2,432	237.0	108.6
6	S	653	92.4	823	80.2	126.0
7	Gypsum	681	96.3	1,144	111.5	168.0
8	TSP+S+K	3,058	432.5	3,167	308.7	103.6
9	Check	707	100.0	1,026	100.0	145.1
10	TSP+S+Mo+K	3,003	424.8	3,231	314.9	107.6

Part B - Dry Weight of Subclover In The Vegetation Produced in 1968 and 1969

Treatment No.	Description*	1968			1969			1969 As a % of 1968
		Dry Wt. (Lbs./ac.)	% of Total Forage	% of Check	Dry Wt. (Lbs./Ac.)	% of Total Forage	% of Check	
1	K	162	24.4	60.2	146	14.6	65.5	90.1
2	TSP	1,004	41.1	373.2	962	35.2	431.4	95.8
3	TSP+S	1,044	38.1	383.1	556	25.1	249.3	53.3
4	SSP	1,093	44.5	406.3	810	32.2	363.2	74.1
5	TSP+S+Mo	1,144	51.1	443.5	900	37.0	403.6	78.7
6	S	178	27.3	66.2	155	18.8	69.5	87.1
7	Gypsum	236	34.7	87.7	289	25.3	129.6	122.5
8	TSP+S+K	1,569	51.3	583.3	1,333	42.1	597.8	85.0
9	Check	269	38.0	100.0	223	21.7	100.0	82.9
10	TSP+S+Mo+K	1,541	51.3	572.9	1,286	39.8	576.7	83.5

* K= Muriate of potash, 248 lbs. K₂O per acre; TSP = TVA treble superphosphate (0-54-0-0), 100 lbs. P₂O₅ per acre; S= elemental sulfur, 50 lbs. S per acre; SSP = single superphosphate (0-20-0-10), 100 lbs. P₂O₅ and 50 lbs. S per acre; Mo = Mo coat on TVA treble superphosphate, 1 lb. Mo per acre; Gypsum (calcium sulfate) as a source of sulfur, 50 lbs. S per acre.

Table 2

Part A - Calculated Value of Digestible Protein in the Vegetation

Treatment No.	Description*	1968		1969		1969 D.P. Production As a % of 1968 D.P. Production
		Lbs. Per Acre	% of Check	Lbs. Per Acre	% of Check	
1	K	38.2	62.2	47.7	83.2	124.9
2	TSP	186.4	353.7	155.5	271.4	83.4
3	TSP+S	204.6	383.2	132.3	230.9	64.7
4	SSP	191.3	363.0	169.7	296.2	88.7
5	TSP+S+Mo	210.3	399.1	188.4	328.8	89.6
6	S	39.6	75.1	43.8	76.4	110.6
7	Gypsum	48.1	91.3	65.2	113.8	135.6
8	TSP+S+K	274.4	520.6	250.7	437.5	91.4
9	Check	52.7	100.0	57.3	100.0	108.7
10	TSP+S+Mo+K	269.5	511.4	232.6	405.9	87.8

Part B - Calculated Value of Total Digestible Nutrients in the Vegetation

Treatment No.	Description*	1968		1969		1969 T.D.N Production As A % of 1968 TDN Production
		Lbs. Per Acre	% of Check	Lbs. Per Acre	% of Check	
1	K	335.4	87.8	519.8	96.1	155.0
2	TSP	1,325.8	347.4	1,306.6	241.5	98.6
3	TSP+S	1,480.3	387.5	1,172.2	216.6	79.2
4	SSP	1,339.4	350.7	1,346.7	248.9	100.5
5	TSP+S+Mo	1,232.7	322.7	1,311.2	242.3	106.4
6	S	346.5	90.7	441.5	81.6	127.4
7	Gypsum	356.6	95.7	606.0	112.0	165.8
8	TSP+S+K	1,684.6	441.0	1,720.5	281.5	102.1
9	Check	381.9	100.0	541.0	100.0	141.7
10	TSP+S+Mo+K	1,653.9	433.0	1,749.3	323.3	105.8

* K = Muriate of potash, 248 lbs. K₂O per acre; TSP = TVA treble superphosphate (0-54-0-0), 100 lbs. P₂O₅ per acre; S = elemental sulfur, 50 lbs. S per acre; SSP = single superphosphate (0-20-0-10), 100 lbs. P₂O₅ and 50 lbs. S per acre; Mo = Mo coat on TVA treble superphosphate, 1 lb. Mo per acre; Gypsum (Calcium sulfate) as a source of sulfur, 50 lbs. S per acre.