

Pasture Fertility Experiment

The increase of cattle in the irrigated portion of Central Oregon and the decline in cattle price has precipitated in a demand for cheap forage and feed for livestock.

A consequence of this demand for cheaper forage has been a request by the farmers for an irrigated pasture fertility experiment.

A previous pasture trial indicated no response to phosphate fertilizers; consequently this experiment was designed to test nitrogen alone as a pasture fertilizer. It was hoped that information would be gained on the top economical level of N and whether the N should be applied in one, two, or three applications for the most efficient use of the nitrogen.

For the trial, ammonium nitrate was used as the source of N. To compare ammonium sulphate with ammonium nitrate as a source of N, one treatment of ammonium sulphate was included.

The trial was located on the Dave Frost farm on the Agency Plains approximately seven miles northwest of Madras, Oregon.

The soil was Madras sandy loam.

The field in which the trial was located had not been previously planted to an irrigated crop. The pasture was seeded to Alta fescue and Ladino clover in the spring of 1952 with 100 pounds of ammonium sulphate. After the pasture was well established it was fertilized with 200 pounds of 16-20-0.

April, 1953, the pasture received 100 pounds of ammonium nitrate.

June 2, 1953, approximately two tons of air dry forage per acre was removed by clipping the trial area. The trial was laid out and fertilized on that date.

The experiment consisted of the twelve treatments shown in Table No. 34. Each plot was 8 x 25 feet and replicated three times in a randomized block. Prior to clipping the yield sample each replication was trimmed to 18 feet. The yield sample consisted of a three foot swath 18 feet long. The samples were raked and the field weights recorded. A moisture sample of approximately two pounds from each plot was bagged and taken to Redmond to be weighed. After the moisture samples were weighed, they were dried and reweighed. Pounds of air dry forage for the treatment was determined from the percentage dry weight of the sample and converted to pounds of air dry forage.

On completion of each clipping the trial was grazed by sheep. The grazing was probably a little close for rapid recovery of alta fescue.

Clippings were made on June 29, July 26, and September 9, 1953. Just prior to the second clipping, sheep broke into the trial area and ate between 1/2 and 2/3 of the forage. It was obvious that there was selective grazing but it was impossible to tell how much had been eaten from a given plots. Consequently, no attempt was made to compensate for the error in the data.

Early in the season it appeared that there was a reasonable balance between the alta fescue and the Ladino clover; however, toward mid-season it became apparent that the clover was afflicted with the aster yellows virus that causes late breaking in potatoes, and the clover never produced its normal share of the total forage.

Considering the condition of the Ladino clover in this pasture it would probably be more accurate to consider the pasture as a grass pasture.

Table No. 34 presents the results from the three clippings. The total forage yields indicate that there was a significant forage increase with each additional 40 pound nitrogen increment up to 120 pounds of N. Possibly this increase would have continued through 160 pounds of N if the plots had not been subjected to unwanted grazing by sheep prior to the second cutting.

When considering total forage produced, a single early application was superior to two and three equal applications at the 120 and 160# N levels. However, the large increase in forage was produced during a period of ample forage.

At the 80# N level there was no difference in forage yield whether the fertilizer was applied in one or two applications, provided those fertilizer applications were applied while the grass was capable of vigorous growth.

Under the conditions of the experiment ammonium nitrate yielded significantly more than did a similar treatment of ammonium sulphate.

There was a maximum increase of air dry forage produced between June 2 and September 9 of 2383 pounds per acre by 120# of N applied in one application.

Valuing N at 16¢ per pound, 1 1/6 tons of forage was produced for \$18.20.

Because of the several mentioned errors it is impossible to say that 120 pounds of N was the top level of N for the experiment regardless of what the data indicates.

Summary

A pasture trial was established on a Madras sandy loam soil seven miles northwest of Madras, Oregon.

The trial was originally intended to be an alta fescue-ladino clover mix; however, because of a virus affliction of the Ladino clover the pasture was, for all practical purposes, a grass pasture.

The trial was established to gain information on the top level of N for a pasture under Central Oregon conditions. Also to determine whether the nitrogen should be applied as one, two, or three applications.

The results indicated that air dry forage yield per acre was significantly increased with each 40 pound increment of N added up to 12-# of N. Because of damage to the experiment by unwanted grazing of sheep prior to the second cutting it was impossible to say whether the 160# N rate might not have been superior to the 120# rate.

One single early application resulted in higher total forage yields than did either the two or three applications. However, the greatest increase came at a time of lush pasture growth.

Nitrogen supplied as ammonium nitrate yielded significantly higher than N supplied by ammonium sulphate in the one comparison included in the experiment.

Because of the late date of establishment the virus attack on the clover and the unwanted grazing by sheep, it is thought that the information gathered in this experiment should not be taken literally regardless of statistical significance.

Table No. 34  
 Summary Table Showing Effect of Time, Rate and Number of Nitrogen Fertilizer Applications on Yield of Pasture Forage. Yield in Pounds of Air Dry Forage.

Dave Frost 1953 Madras, Oregon

Time & Rate of Fertilizer Application				Yield in Pounds of Air Dry Forage			
Fertilizer in Pounds Per Acre							
6/2/53	6/29/53	7/26/53	Total	1st (3)	2nd (4)	3rd	Total
N (1)	N	N	N	Cutting	Cutting	Cutting	Yield
-	-	-	0	1729.0	368.4	107.3	2204.7
40	-	-	40	2038.2	613.0	204.9	2856.1
40	40	-	80	2172.6	1040.6	522.4	3735.6
40	-	40	80	1997.8	602.3	401.4	3001.5
40	40	40	120	1914.5	927.7	648.8	3491.0
53 1/3	53 1/3	53 1/3	160	2417.3	1150.8	868.5	4436.6
53 1/3 (2)	53 1/3 (2)	53 1/3 (2)	160	2307.0	997.6	700.4	4005.0
60	60	-	120	2499.3	1040.6	425.1	3965.0
80	-	-	80	2328.5	847.0	385.6	3561.1
80	80	-	160	2282.8	1019.1	533.2	3835.1
120	-	-	120	2586.7	1487.0	514.1	4587.8
160	-	-	160	2941.6	876.7	785.4	4576.7
LSD @ 1%							306.5

- (1) - N supplied as Ammonium Nitrate except where noted      Coefficient of Var. 14.7%  
 (2) - N supplied as Ammonium Sulphate  
 (3) - Prior to fertilization on June 2, 1953, approximately two tons of forage was removed from trial area.  
 (4) - Between 1/2 & 2/3 of forage eaten by sheep before cutting.

Cutting Dates

- 1st cutting - June 29, 1953  
 2nd cutting - July 26, 1953  
 3rd cutting - September 9, 1953