

THE EFFECT OF NITROGENOUS FERTILIZERS ON CATTLE DISTRIBUTION ON MOUNTAIN RANGE

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One of the most important problems facing range managers in the western states is non-uniform distribution of livestock. The problem increases in importance on ranges with high uplands with interspersed valleys and stream bottoms. Cattle have a natural tendency to congregate in the valleys and stream bottoms. As a result of this tendency, lowlands are frequently heavily grazed while adjacent slopes and hilltops remain lightly utilized.

Common range practices used to encourage cattle to utilize forage in rough areas include (1) development of salting, watering and supplemental feed-grounds within lightly used areas, (2) drift fences, and (3) range riders. Although one or a combination of several of these practices has been helpful in obtaining uniform grazing, much remains to be desired.

Studies conducted in 1955 on the Bighorn National Forest in-

licated that the application of 67.5 pounds of nitrogen in the form of urea was effective in obtaining grazing on areas ordinarily used very lightly. The production of grass was not significantly increased.

Procedure and Results

On June 20, 1956, a strip of rangeland 350 feet wide and one mile long was fertilized with urea at a rate of 67.5 pounds of nitrogen per acre. The material used was applied by airplane to an area which received only 15 percent utilization in 1955.¹ Utilization checks, based upon leaf height of Idaho fescue made in September of 1956 showed 73 percent use on the area actually fertilized and 55 percent use of the adjoining non-fertilized area.

¹ Material furnished by the Allied Chemical and Dye Corp.

Table 1. Summary of analysis of variance of forage utilization on fertilized and non-fertilized areas in the Big Horn Mountains

Source of Variation	D.F.	Mean Square	"t" Value
Treatments	2	865.28	26.81**
Carryover <i>vs</i> current effect	1	597.54	18.52**
Check <i>vs</i> fertilized areas	1	1130.00	35.02**
Error	9	32.27	

** Indicates significance at .01 level.

On June 28, 1957, 30 acres of rangeland were fertilized with an aerial application of 200 pounds per acre of ammonium nitrate (33 percent N)². Utilization checks, based on leaf height of Idaho fescue, were completed in September on the 1956 and 1957 fertilized areas and on an unfertilized check area. Each area was sampled four times, measuring

² Material furnished by the Phillips Petroleum Co.

50 plants per sample. Mean utilization based on these data are as follows: check area, 29; 1956 plot, 41; and 1957 plot, 58 percent. These data were subjected to analysis of variance, and the results are presented in Table 1.

These statistics indicate that the application of 67.5 pounds of nitrogen per acre increased utilization of forage on normally lightly grazed areas and that the 1956 application had a significant carry-over effect upon livestock distribution in 1957.