

Grow More Grass!

By Controlling Mesquite

S. Clark Martin

That mesquite patch on your ranch might grow five or 10 times as much grass without the mesquite. If all the trees were killed, the benefits should last for many years. These statements are supported by experiments in progress at the Santa Rita Experimental Range located 30 miles south of Tucson.

In 1945, study areas were established at elevations of 4100, 3700, 3400, and 3150 feet. Each area included an undisturbed stand of mesquite, a mesquite-free plot, and plots thinned to leave 25, 16, and 9 trees per acre, respectively.

Each plot covered two acres and measured 209 feet by 418 feet. Lehmann lovegrass was seeded across the ends of all five plots at each study area. A few characteristics of the study areas are:

	4100 ft.	3700 ft.	3400 ft.	3150 ft.
Rainfall (inches)				
Annual - - - - -	17.0	14.0	13.0	12.0
Summer - - - - -	9.8	8.5	7.7	7.9
Mesquite density (trees per acre) - - - -	358	138	164	44
Stocking on adjacent range (acres per cow) - - - -	36	50	80	100

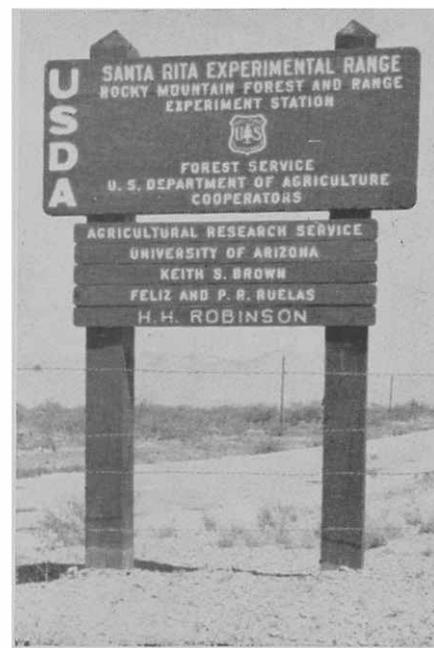
How Much Grass and What Kind?

Killing all the mesquite increased grass yields several fold at all four areas. Yields on plots with 16 and 25 trees per acre were about half as great as on those with no mesquite. In 1958, 14 years after treatment, total yields of annual and perennial grass herbage combined were:

	4100 ft.	3700 ft.	3400 ft.	3150 ft.
	(Pounds of grass per acre)			
Number of mesquite trees per acre:				
Full stand - - - - -	339	172	32	59
25 - - - - -	693	449	211	136
16 - - - - -	898	547	121	316
9 - - - - -	827	966	131	489
None - - - - -	1,526	1,078	445	636

The relative amounts of native perennial grass, Lehmann lovegrass, and annual grasses in the total herbage differed among study areas.

	4100 ft.	3700 ft.	3400 ft.	3150 ft.
	(Per cent composition)			
Herbage on mesquite-free plots:				
Native perennials - - - -	35	46	53	14
Lehmann lovegrass - - - -	64	48	20	1
Annual grasses - - - - -	1	6	27	85



Grass Varies by Altitudes

On these mesquite-free plots, the yields of Lehmann lovegrass exceeded those of native perennial grasses at 4100 feet, but the proportion of lovegrass decreased with decreasing elevation and rainfall.

Under full stands of mesquite, Lehmann lovegrass made up about half of the total herbage at 4100 feet, and 11 per cent at 3700 feet. There was no lovegrass at the two lower study areas, which indicates these areas apparently were not well suited for growing this species. Mesquite control greatly aided the establishment of the lovegrass at the two upper elevations.

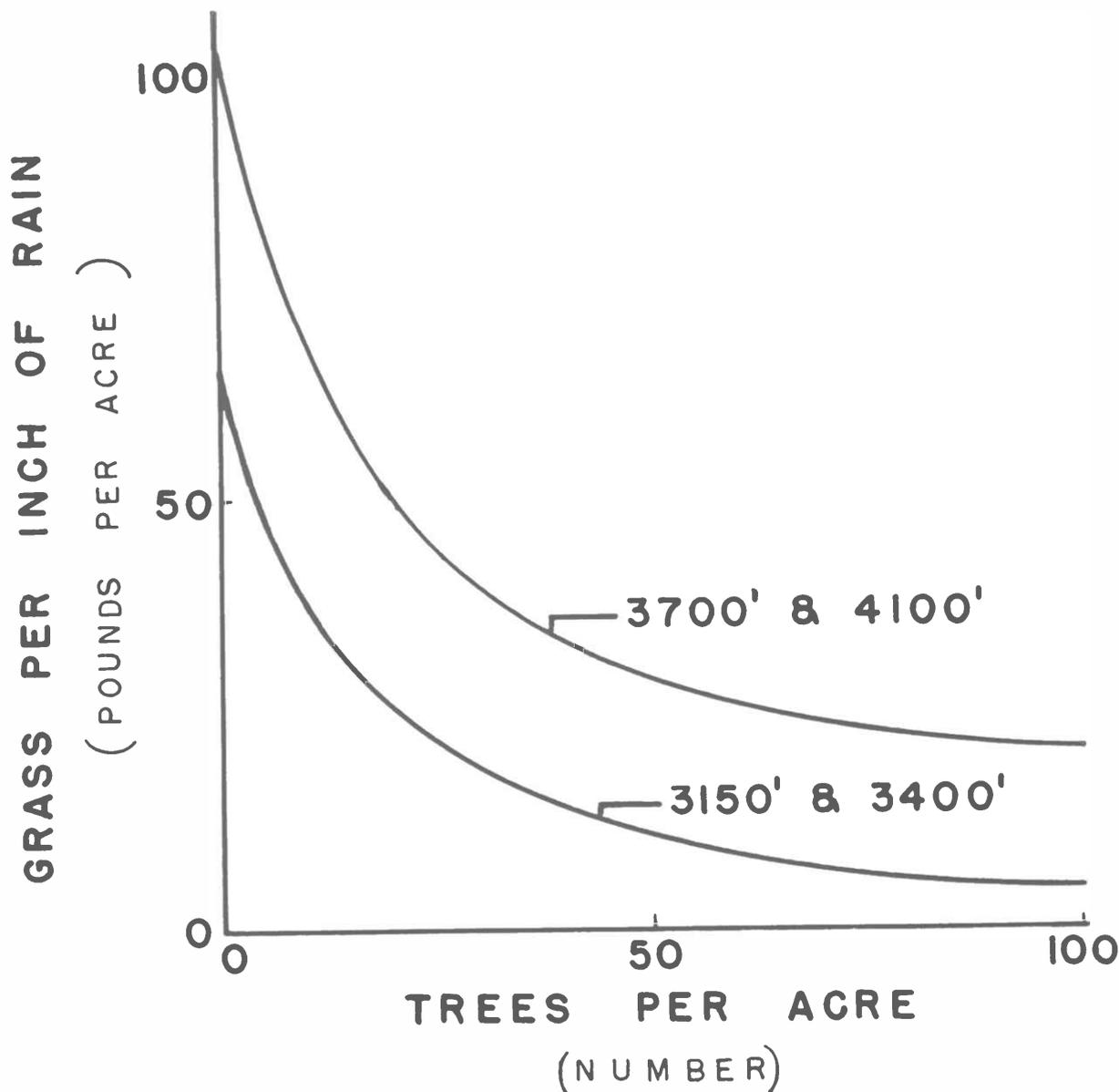
Mostly Annuals at Lowest Levels

Annual grass production was highest on mesquite-free plots at the lowest elevation, and decreased with increasing elevation and mesquite density. At 3150 feet, annuals accounted for 85 per cent of the total grass herbage on mesquite-free land and 37 per cent under the full stand of mesquite. At 4100 feet annual grasses produced little or no herbage, even on the mesquite-free plot.

Native perennial grasses, combined with Lehmann lovegrass, made up from 73 to 100 per cent of the total grass herbage except at the lowest elevation. Observations suggest that the seeding of lovegrass was not necessary to produce a good grass stand, and that if the lovegrass had not been planted the native perennial grasses alone would have produced about as much herbage as is now produced by the combination.

At the lowest elevation the perennial
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This is a contribution from the U.S. Department of Agriculture in cooperation with The University of Arizona. Mr. Martin is a Range Conservationist with the Rocky Mountain Forest and Range Experiment Station, Forest Service.



RELATION OF GRASS herbage produced per inch of summer rainfall received at the Santa Rita site, and the number of mesquite trees growing on the site.

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grass stand on the mesquite-free plots was sparse. In 1958 it made up only 15 per cent of the grass herbage.

How Much Grass Per Inch of Rainfall?

Grass yields, expressed as the amount produced per inch of summer rainfall, provide a crude estimate of the relative efficiency of each plot for grass production. In 1958, the grass yield per inch of summer rainfall was greatly inhibited by mesquite at all study areas, as shown by the graph.

The 4100-foot and 3700-foot areas produced almost equal amounts of grass per inch of summer rain on 16.9 and 9.5 inches of rainfall respectively. The two lower areas both received about 7.5 inches of rain. They produced about one-third less grass per inch of summer rain than the higher areas.

The average grass yield per acre per inch of summer rainfall on mesquite-free plots was 102 pounds for the upper study areas and 71 pounds for the lower. The

relative advantage of mesquite control, however, was greater at the lower elevations. Mesquite removal increased grass production 12 times at the lower elevations but only five times at the upper.

Management Important, Too

When a mesquite tree is killed, more moisture is available for grasses within reach of its root system. Grass plants that are already established *can* use this additional moisture to grow and set seed. In time, new grass plants *can* fill in the bare spaces, reduce surface runoff and evaporation, and thereby make still more water available for grasses.

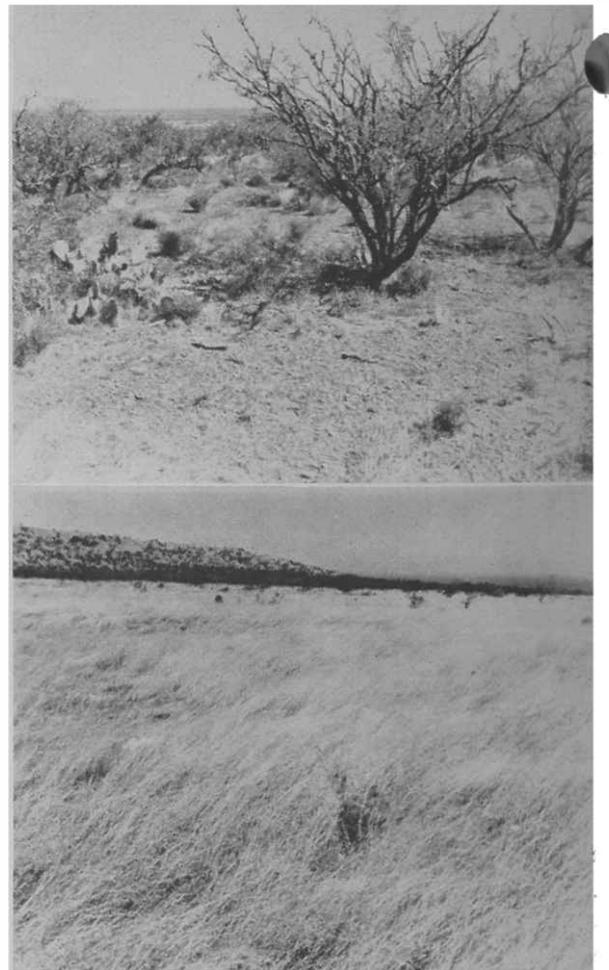
The grass stand eventually *can* become as thick and tall as the climate and soil will support. These improvements *will* happen if grazing practices fulfill the needs of the important forage grasses.

Rest during the spring or summer growing periods will help — the oftener the better. Use may vary somewhat from year to year, but should average around 40 per cent for the better perennial grasses.

Gamma Sigma Delta Chooses Bob Briggs

Dr. Robert E. Briggs, of the agronomy department of this college, is new president of Gamma Sigma Delta, agricultural honor society. Officers were named at the annual spring banquet in May.

Dr. Melvin H. Schonhorst, also an agronomist, is vice-president; Dr. Bobby L. Reid, poultry department, secretary; and Dr. Leonard W. Dewhirst, animal pathology, treasurer. Prof. Ernest B. Stanley, of animal science, continues as chapter historian.



APPEARANCE OF VEGETATION at elevation of 4,100 feet on the Santa Rita Experimental Range in 1960, some 15 years after the mesquite control study began. In 1958, with a 17-inch summer rainfall, the plot in the top picture (with 358 mesquite trees per acre and no mesquite control) produced 20 pounds of grass per acre per inch of rainfall. In the lower picture, where mesquite is completely eradicated, there was 91 pounds of grass produced per acre per inch of rainfall.