

R E S E A R C H N O T E S
SOUTHWESTERN FOREST AND RANGE EXPERIMENT STATION¹

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MAINTAINING THE BALANCE BETWEEN SUMMER AND WINTER FORAGE
ON BLACK GRAMA RANGES UNDER YEARLONG GRAZING USE

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Black grama type important in Southwest. Black grama (*Bouteloua eriopoda*) is one of the most highly prized forage grasses in Arizona, New Mexico, and west Texas. Although it is often the dominant grass on the lower plains, it is rarely found in pure stands over very large areas. Other grasses, mainly sand dropseeds (*Sporobolus* spp.), the three-awn grasses (*Aristida* spp.), and other species of grama, are almost invariably mixed with it. Usually, on undeteriorated black grama type ranges, this mixture is comprised of about 80 to 85 percent black grama and 15 to 20 percent other grasses. Because of differences in their seasons of usability, the relative proportions of black grama and the associated grasses is an important factor to be considered in range management. The distribution in the season of highest usability is as follows:

Black grama provides usable forage throughout the entire year although it is grazed more readily after the close of the growing season. Other grasses usually found in the black grama type are more palatable during the summer months. Black grama increases in relative palatability as the fall and winter advance, while the other grasses become less palatable with the advent of autumn frosts. This seasonal difference in palatability strongly suggests the desirability of stocking black grama ranges on the basis of relative amounts of the associated species available for summer use and black grama for winter use. An ideal condition would be one in which the supplies of summer and winter forage are equal to the seasonal forage requirements of the cattle. Often, under conditions prevalent on the range, the seasonal forage supply is out of balance. This inequality may be due to natural conditions or it may have been brought about by past grazing use. On many ranges which have been closely grazed, black grama has decreased in amount and the other grasses have increased proportionately. Whenever an unbalanced condition of this character exists, the actual grazing capacity of the forage under yearlong grazing use is lower than the potential capacity of the range. If corrective measures are not applied, this condition is likely to develop into a more serious phase bordering on range depletion.

Methods of range management which may be employed to restore and maintain the most desirable vegetational composition on black grama ranges are suggested by the results obtained from experiments conducted

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on the Jornada Experimental Range^{2/}. Here, during the past quarter of a century, varying numbers of cattle have been grazed year long in a large pasture in which all conditions of black grama range, from the best to the poorest, were represented within the experimental area.

Vegetational changes brought about by drought and close grazing. A general picture of the trends in vegetational composition is presented in figure 1. The lines on this chart show separately the progressive changes in the trends of: (1) all perennial grass, (2) black grama, and (3) all grasses other than black grama in terms of percent of total vegetation.

At the beginning of the experiment (1915) perennial grasses represented a total of 98 percent of all forage plants. Black grama accounted for 63 percent, and all other grasses 35 percent. In the early years of the experiment (1915-24), the rate of stocking, averaging more than a thousand head per year, was based on the total forage represented by all grasses with no adjustment for differences in their season of usability. During this period the percent of all grasses became slightly depressed (about 10 percent), black grama dropped sharply, and the percent of summer forage grasses increased. After 10 years (1924) under this rate of stocking, the perennial grasses made up 88 percent of the total vegetation. Black grama dropped from 63 percent to 26 percent during the 10-year period, and the associated grasses had increased from 35 to 62 percent. Black grama, a drought resistant plant, had lost ground while less drought resistant grasses had made relative gains although the total percent of perennial grasses was less than in 1915. Quadrats in pastures, managed under a system of light to moderate grazing, show that the relative positions of the black grama and its associates should be the reverse of what they were in 1924.

The main effect of this system and intensity of grazing was to upset the balance between summer usable and winter usable forage. The vegetational composition of the pasture was gradually being changed from a balanced yearlong type to one in which there was a relative shortage of the most desirable winter forage, and this resulted in a material loss of efficiency in livestock production.

Perennial grass composition as affected by conservative stocking. During the second 10 years (1925-34) the pasture was stocked on the basis of an average of approximately one-half as many head of cattle year long than for the preceding 10-year period. Under this rate of stocking, a drought reserve of 25 to 30 percent of the average forage crop was maintained. Rainfall for this decade ran slightly higher than that of the previous 10 years. Annual precipitation averaged 9.78 inches with a high of 17.73 inches and a low of 5.18 inches. Average summer seasonal rainfall was 5.07 inches with a high of 8.53 inches and a low of 1.74 inches. Although the average and the maximum precipitation was greater than in the previous 10 years, the minimum summer seasonal rainfall was 26 percent below any previous figure.

^{2/}A branch of the Southwestern Forest and Range Experiment Station located 23 miles north of Las Cruces, New Mexico.

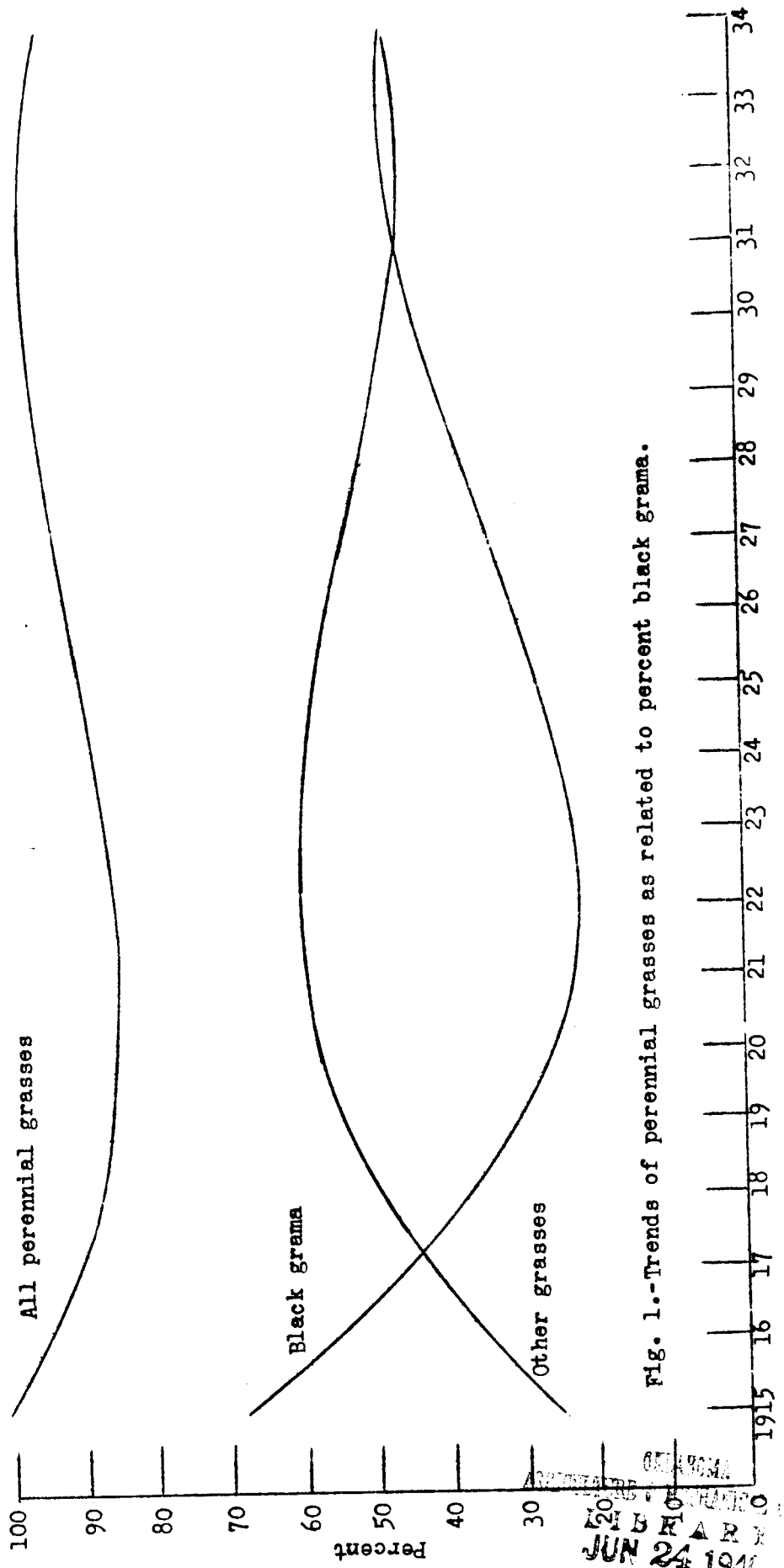


Fig. 1.-Trends of perennial grasses as related to percent black grama.

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With the lower rate of stocking the vegetational response was immediately noticeable. By 1934 the composition percentages stood as follows: Perennial grasses comprised 99 percent of total vegetation, black grama had more than doubled its relative area and now represented 55 percent. Other grasses had been supplanted by black grama to the extent that they made up but 44 percent of the vegetation.

Although the most severe drought ever recorded in New Mexico occurred in 1934 and the vegetation had suffered because of it, the range came through in relatively good shape. This condition was due principally to conservative stocking. Under conservative use black grama had expanded at a rate that enabled it eventually to equal and then to surpass in relative abundance the grasses associated with it. During a period of 10 years the forage composition had been changed for the better. By the process of conservative grazing a depleted but potentially yearlong range was started well on its way to maximum productivity.

Principals to be observed in balancing forage composition on black grama range.

1. Black grama rarely, if ever, occurs in pure stands. It usually has other grasses associated with it. These other grasses are chiefly palatable in the summer months, while black grama attains its highest relative usability in the fall, winter, and spring months between the end of one growing season and the beginning of the next one.
2. An acceptable management plan must take into account the natural tendencies and peculiarities of the vegetation comprising the range type. Differences in season of usability between species especially should receive due consideration in the grazing plan.
3. Encourage the use of each grass during the season of its highest usability by keeping careful control of the seasonal distribution of stock. Strive in this manner to graze the summer usable grasses in the summer and to reserve the greater part of the yearlong palatable black grama for use during the winter. When examination of a black grama range shows the winter usable forage to be out of balance with the summer usable forage, steps should be taken to restore them to their proper proportions. This process usually consists of applying a program of moderate use in order to allow the black grama to return to its natural dominant position in the stand.
4. Prepare for future drought. Keep in mind always that black grama can be reserved for future use because it retains its usability for a longer period than any of its associates. A 25- to 30-percent reserve of black grama left ungrazed at the beginning of the new growing season will usually prevent serious losses from starvation in the event of drought. At the same time this practice of moderate grazing use is an investment which gives a good return in the form of increased forage production and is reflected in the condition and productivity of the livestock.