ORGANIZED FARMING

To Make Farming More Profitable—
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Published by the Dona Ana County
Farm Bureau

VOL. III—NO. 3 LAS CRUCES. NEW MEXICO, FEBRUARY, 1922 PRICE FIVE CENTS

Calf Crop Increases on the Jornada

Grazing Examiner Conducting Investigation at Reserve Also Reports Improved Herds, Better Ranges and Reduction in Losses

By E. W. NELSON, Grazing Examiner

New Mexico has in the neighborhood of 70,000,000 acres of land chiefly valuable for the grazing of livestock. About 18,500,000 acres are found in the southern tier of counties of low rainfall. The importance of this vast area in the economic life of New Mexico may be realized when it is known that an estimate by the Bureau of Markets and Crop Estimates places the number of cattle in southern New Mexico at 435,000 head, or about 30 per cent of the total in the state.

Investigations in range cattle management have been conducted at the Jornada Range Reserve since 1915 by the U. S. Forest Service in cooperation with C. T. Turney, a practical stockman of long experience in the Southwest.

Periodic droughts, varying from one to four years in duration, may occur every seven to ten years and play such an important part in range production in the Southwest that any system of range management must take in consideration this factor. The investigators have endeavored to work out an economic system of management for range and stock which would maintain a good breeding herd, regardless of the drought factor and at the same time secure highest productivity of the forage and proper use of it.

Reserve on Jornada Mesa

The Reserve was set aside by Executive Order for this purpose. It is an area of about 202,000 acres of typical semi-desert range, situated in Dona Ana county. Three-fourths of the Reserve lies on the Jornada mesa and varies in elevation from 4,100 to 4,700 feet. The rest extends to the summit of the San Andres mountains. The locality has a very arid climate with an average annual rainfall of 8.6 inches, and a variation of from 3.5 to 17 inches. The main growing season occurs in July, August and September with an average rainfall of 4.5 inches. As much as 60 per cent of the annual precipitation may occur during these three growing months.

Practically 80 per cent of the palatable forage on the Reserve is furnished by perennial grasses; black grama, three awn or needle grass, tobosa drop seed and alkali sacaton. Browse occurs in large quantities on portions of the Reserve of which mesquite is the predominating species.

FACTS ABOUT RESERVE

Jornada Reserve consists of 202,000 acres of semi-arid range, situated 25 miles northeast of Las Cruces.

It was set aside by Executive Order for the purpose of conducting cattle experiments in cooperation with C. T. Turney, a Southwest cattleman.

Investigations conducted by the U. S. Forest Service to secure an economic system of management of range and cattle.

Results have been improved range herds, increased calf crops, reduced losses and better ranges.

To secure better and proper utilization of the different classes of palatable forage, the Reserve has been divided into summer and winter range units as far as practicable, based upon the suitability of the various kinds of forage for use at various times of the year.

Winter and Summer Range

The black grama type constitutes the winter range, while grasses that do not cure well on the stalk and must be utilized while green constitute the summer range type. The winter and summer range types, where possible, have been fenced into grazing units or pastures. The use of each pasture will be discussed later in relation to the different herds on the Reserve.

An important problem—water development—has been developed to a high degree. The only watering places available when Mr. Turney came to the area in 1904 were mountain springs and intermittent lakes on the Jornada plains. Deep wells varying in depth from 125 ft. in the mountains to 500 feet on the flats have been put down. Studies show that permanent watering places on range similar to the Jornada should not be more than five miles apart, and that not more than 500 head of cattle should be watered at each well To supplement the permanent waters on the Jornada, tanks to catch flood waters and which hold water from two to twelve months have been constructed. It was found that by proper distribution of these tanks the forage was better utilized and range adjacent to permanent waters thereby relieved.

Maintaining Breeding Herds

The Southwest is primarily a breeding country, and, therefore it is necessary to maintain the breeding herds over the drought periods. Studies have been conducted to date on the Reserve with three herds, a 1,000 to 1,200 head herd, a 400-head herd, and a herd varying from 42 to 80 cows. The large herd is one of average grade Hereford cows which in 1915 were less than 50 per cent white face, but have now been improved to approximately 100 per cent white face. The average rate of culling out the inferior stock has been 12 per cent each year. This herd runs in a pasture of approximately 75,000 acres of winter and summer range.

Should forage in this pasture become depleted at any time, a reserve pasture of

winter range is available for use by the herd. The data secured on the herd are: Number animal days feed, calf crop, losses, improvement of grade and condition of stock at different times of the year.

The 400-head herd consists of selected cows with Hereford characteristics. Improvement of the herd is made by culling out the undesirable cows and replacing the older ones with young heifers more than twenty months of age. The cows in the herd are kept in good breeding condition as far as possible. Separate pastures are provided for summer and winter range.

Cotton Seed Cake is Used

In addition, it has been found desirable and practical to supplement the range forage with a small amount of concentrates, such as cottonseed cake, to keep the cows in good breeding condition at critical times of the year. The feeding is done in small pastures where weak cows can be looked after better. Similar data are secured for this herd as for the large herd.

To determine the practical results with a small herd, data have been secured from one varying from 42 to 80 cows and one or two bulls. Results in the calf crop alone warrant careful consideration of the small herd to secure maximum production.

The good results in improvement in grade of stock and increase in calf crop are attributed in a large measure to the use and proper care of pure-bred bulls. In 1910, practically all of the bulls in the herds were grade Herefords and Shorthorn with a few pure-bred bulls. Since 1915, only registered Hereford bulls have been purchased. Bulls on the range in the Southwest ordinarily receive very little care.

It has been found that they do better if gathered in the fall and fed cottonseed cake and hay, if necessary, during the winter and spring to keep them in condition for the next breeding season. By restricting the breeding season a more even-aged calf crop has resulted.

Results in Various Herds

The following table shows the number of calves per hundred cows of breeding age obtained in the various herds on the Jornada Range Reserve and the best similar data obtainable for similar open range in Southern New Mexico and for the State as a whole:

Year	So. N.M	N.M.	Jornada Reserve	400 Herd
1916	55	--	72	81
1917	35	33	64	68
1918	25	30	59	80
1919	35	25	44	52
1920	70	60	83	88
1921	50	60	75	75
Average	45	42	66	74

It will be noted that in each case the calf crop is materially larger for the herds on the Reserve than for outside range herds. The larger calf crops on the Reserve have resulted mainly from effort to maintain the breeding stock, both cows and bulls, in better condition by reserving range forage for use during the critical period of the year, and supplemental feeding when necessary, employing riders to keep bulls well distributed among the cows during the breeding season, and segregating breeding from non-breeding stock.

Breeding Stock Restricted

Forage shortage, due to drought conditions, results in serious losses of livestock on these ranges. To keep the breeding herd intact through a drought period, the plan on the Jornada is to restrict the number of breeding stock to one-half of the carrying capacity of the entire range in good years, and use forage not required for the breeding herd in good years by steers or other surplus stock. A market is more readily available for the latter class of stock at all times, and, when necessary, these surplus stock may be sold to make room for the breeding herd.

To keep down losses from forage shortage during the critical period of any year, plans have been followed at the Reserve as follows: (1) Reserving a supply of range forage; (2) Early weaning of calves, and (3) Use of supplemental feeds. The reserving of range forage is accomplished by restricting or deferring, partially or wholly, grazing of black grama grass or similar winter range during the main growing season. This plan not only assures a supply of forage for use when needed, but also allows improvement of the stand of forage.

Weaning of the calves before the mothers are too poor, and placing the calves on feed is followed out each year at the Reserve. Last fall there was a market for good calves, so a large percentage of the year's crop, including heifers were sold. The best heifers, however, were retained for replacement of old cows in the herds.

Use of Supplemental Feeds

Use of supplemental feeds has been carried out on a large scale. It has been found a good practice to feed a small amount of cottonseed cake even during favorable winters to keep cows and bulls in good growing condition and maintain the growth of young stock. The cost of feeding to keep cows on a maintenance ration or in breeding condition has been from $1.47 to $4.95 a head, the latter being in the extreme drought year of 1918.

Drought conditions sometimes prevail longer than surplus range forage has been provided for. This was found true during the last drought, and feeding of soapweed was developed extensively to carry the stock through. Soapweed is a native plant growing over large areas on the Jornada. Slow growth and replacement, however, are against its use except as an emergency feed. The cost of cottonseed cake and soapweed together, for a period of approximately six months, was $3.83 a head actually fed.

The effectiveness of the practice followed to keep down losses is reflected in the results obtained. During 1918, the most critical year of the last drought period, the loss amounted to only 3.5 per cent. The average loss from all causes on the Reserve since 1915 has been kept down to approximately 2 per cent by following the methods outlined, and measures to prevent disease. On the other hand, on similar open range in southern New Mexico, the losses have ranged from three to ten times as great.

Forage Plants Not Injured

Determination of the number of stock that the year-long semi-desert ranges of the Southwest can properly carry over a period of years without injury to the palatable forage plants, is of prime importance to a stable livestock production. It is complicated by many factors. Overgrazing, adverse climatic conditions and rodents have depleted the range in many instances to the extent that it has resulted in the replacement of palatable forage plants by those of inferior value.

The volume of forage produced on the same area in different years may vary on account of either climatic or grazing factors, or both. There may be a reduction of as much as 50 per cent of the volume produced during the normal year, due to drought alone. In addition, forage production may vary in the same year on different parts of an area the size of the Jornada reserve, because of uneven distribution of the rainfall.

The following data show the percentage of forage each year on a protected area over a period of years as compared with that of areas under different degree and time of grazing:

Year	Outside range	Pasture 2	Pasture 5	
1915	45.4	108.2	3.8	
1916	39.9.	72.2	69.4	Period
1917	34.4	50.0	82.6	of
1918	17.6	34.6	89.6	Drought
1919	27.0	47.5	98.8	
1920	35.7	62.0	68.2	
1921	21.4	53.6	66.9	Dry Year

How Grazing Is Reduced

The outside range was heavily used yearlong with no regulation of grazing up until 1918. Since that time grazing has been materially reduced during the growing season, with full use thereafter. Pasture 2 was grazed yearlong without overgrazing, but with no reduction in grazing during growing season from 1916 to 1919 inclusive. Since that time grazing has been reduced during the main growing season, but full use of forage obtained later in the year. In pasture 5 grazing has been reduced during the growing season since 1915, but the pasture has been carefully utilized the rest of the year. Stock is ex-

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CALF CROP INCREASES

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cluded yearlong from the areas used as checks.

The decrease in carrying capacity at the end of the drought, on a basis of 100 per cent for the year 1915--'16, had amounted to 47 per cent of what it was in 1915-16 in pasture 2; 90 per cent in pasture 5; and 27 per cent on the outside range. The reduction in carrying capacity occurred as a depreciation of 40 per cent in the stand of forage and a reduction of 50 per cent in volume per unit of area of forage produced. A greater reduction occurs in overgrazing, or amount of grazing during the growing season increases. In addition, such improper management favors replacement of palatable forage by less palatable species.

Overgrazing and drought not only affect the growth of forage species but retard and greatly lessen the opportunity for revegetation. Studies show that because of their low vitality, we cannot depend upon the seed of our Southwestern grasses to revegetate the depleted ranges. Black grama reproduces mainly by runners or stolons which produce young plants that set and become established the second or third year.

Another method of revegetation is by increase in the actual spread of the established grass tufts. To allow for revegetation of black grama grass or other similar grasses by these means, grazing must be restricted during the main growing season.

Results at Jornada Reserve

In conclusion, the results obtained at the Jornada Reserve are as follows:

(1) Improvement of breeding herds by culling out poor grade stock, resulting in practically straight white-face herds. By selecting cows and use of pure-bred Hereford bulls practically all of the calves now show good Hereford characteristics and markings. Fewer steers have been cut back from these herds at sale time than from outside herds.

(2) Calf crops have been increased by following out definite plans providing for reserving forage for the breeding herds for use at critical periods; feeding cows and bulls; distribution of bulls on the range during the breeding season and segregating breeding stock from non-breeding stock. For the six-year period the calf crop on the reserve was 64 per cent greater than in southern New Mexico.

3. Losses on the Reserve have been materially reduced by proper stocking, reserving range forage for winter and spring use, weaning calves in the fall of the year, supplemental feeding, and measures to prevent disease.

(4) Grama grass carefully managed during the drought did not deteriorate as much as overgrazed range, and, although injured by drought, will recover more rapidly than an overgrazed range. When a grama grass range is carefully managed, such as grazing lightly during the growing season, but using fully later, the more palatable forage species will make proper growth which will insure a forage crop for the winter and spring, and insure maintained production of the range.

(5) To insure maintained production from a selected breeding herd on the semi-desert ranges of New Mexico, not more than 50 per cent of the normal capacity should be used by breeding stock. The rest, when available, in good years should be used by steers which can be readily sold in times of forage shortage.

NOTES ON CALF-RAISING

Professor Erf of Ohio State University, was lately quoted as follows:

"The past year the average cost of raising the average animal from a calf to heifer fresh with first calf was $142. The average animal sold for $70. To raise the average pure bred animals from calf to heifer cost $149, and the average selling price was $163. This includes the low priced as well as the high priced animals."

Whether we accept these figures as literally correct for this section or not, there is food for thought in them. Costs of grain and milk fed under our conditions are undoubtedly higher than in Ohio, pound for pound. Whether we conclude it pays to raise pure breds or not is a question with two sides. Whether it pays to raise calves with poor inheritance on meagre feed is a question with only one side. There is an argument for using only good sires or raising no calves. There is also probably an argument for shipping cream in place of whole milk, when milk prices drop much further.

The cow testing association is showing up this month that some herds' production is more than double that of others.

Success in dairying depends on getting a herd of good producers, under a system of reasonable costs.

The calf-raising plans of farmers this year are going to make a difference in their success in the years to come.

FOR SALE—Choice Sonora Seed Wheat; also a few hundred pounds of Mexican June, hand-picked. N. M. Smith, Las Cruces, N. M.