Can Ranchers Adjust To Fluctuating Forage Production[1]

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Highlight

Experience in the Edwards Plateau area of West Texas since 1960 demonstrates that soundly planned range improvement and ranch management make it possible to operate profitably and to adjust to fluctuating forage supplies.

The West Texas rancher's problem of adjusting stocking rates to widely fluctuating forage production is a most difficult one. This problem is not unique to our ranching area. It is common in varying degrees wherever range grazing is practiced. However, due to our erratic rainfall and other climatic factors, we feel that it poses greater problems here than in areas more favorably blessed with rainfall. The need for flexibility in adjusting stocking rates, as well as when and how adjustments should be made, is an important consideration for every ranchman to know so he can, in fact, achieve efficient use and management each year and finally to truly become a conservation rancher. This, in my opinion, is the first step toward becoming a successful ranchman.

Those who are familiar with the wide climatic variations in the more arid sections of West Texas, or for that matter, of most of what we know as the western rangelands of the entire United States, can well appreciate the need to educate range users in this most important facet of proper and profitable range use and management. For this is undoubtedly a most urgent responsibility of all educators in this field, both those technically trained and also laymen such as, for example, Soil Conservation District Supervisors.

Increasingly my sympathy goes out to you educators and research people, for you have tried from the first to teach us this most important lesson. You surely must have often cried out, as did Moses to the Hebrew people as they neared the promised land, "You have been a rebellious people from the start." All too often we have heard ranchers referred to as conservationists when they have merely applied one or more conservation practices, such as brush control, for example, with little or no regard to follow-up management.

Unless we ranchers can come to recognize the need for managing our forage on the basis of each season's production, all your research, all your efforts as educators, most of the Govern-

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ment's cost-share assistance expenditures, as well as the rancher's efforts, time, and money, will in almost all cases be unproductive.

For a moment let us look at the area of West Texas adjacent to San Angelo where we operate our ranch in what is known as the Edwards Plateau. This is an area of over 22 million acres of grazing land. We have an annual average rainfall of 19.5 inches around San Angelo. This area is subject to recurring droughts which are sometimes of extremely long duration. It has a high evaporative rate of 60 inches per year due to long hot summers and prevailing hot, dry winds from southwest.

Several writers have recorded the history of grazing use in this vast area. Their comments about the productive capacity of this formerly lush pastureland of 100 years ago are fascinating to the point of being almost unbelievable. They all picture what is now in many cases semi-desert land as being a prairie of grass largely free of brush except for very scattered stands along the creeks and in the valleys. My father-in-law, Mr. J. R. Mims, who was cowboying in the Edwards Plateau before the turn of the century and is now past 93 years of age, told me that it was then difficult to find enough wood for their chuck wagon campfire!

The blame for deterioration of these ranges must be placed almost entirely upon man's lack of knowledge of the nature and care of grasses, his indifference, and/or his greedy desire to get it all as fast as possible. Of course, the recurring droughts, then as now, hastened and compounded the impact of the continuous serious overuse.

Bray's "The Vegetation of Texas," written in 1905, includes the following statement: "Grazing interests have caused profound changes in the density and vigor of prairie formations and the species composing them. Ranges have been denuded which were formerly covered by luxuriant grass formations. Large areas are now subject to harmful erosion and weeds, inferior grasses and many woody plants have supplanted the original valuable species to a marked degree." That was written in 1905. What would he say if he could see these lands today? And H. L. Bentley, writing in 1898, said that some of the more observant ranchers thought range damage then had gone almost beyond the point of redemption!

The decline in the carrying capacity of some rangeland in the Edwards Plateau is well documented from close records of Substation #14 of Texas Experiment Stations, as reported by Dr. Leo B. Merrill, Range Scientist. There on 3,462 acres between Rocksprings and Sonora, the land use treatment was about the same as on the average ranch until 1948. The stocking rate in 1900 was about 125 animal units per section. At the time the land was purchased for a research station in 1916, the rate was 100 AU/section. Constant yearlong heavy grazing, during the interval 1900 to 1948, caused a continuous decline in the carrying capacity of the average rate of 1.5 AU/section, per year, until in 1948 this land had lost over two-thirds of its former productive capacity. When a grazing study was started in 1948, it was estimated that 32 AU/section was about the safe carrying capacity of the range at that time.

Grazing trials established at the Sonora Station in 1948 included yearlong heavy grazing at a rate of 48 AU/section; yearlong moderate grazing at a 32 AU; yearlong light grazing at 16 AU; and a four-pasture rotation-deferred grazing system with a stocking rate of 32 AU/section. Since 1948, the carrying capacity of the heavily grazed yearlong pasture has declined to 30 AU/section. The carrying capacity of the moderately stocked pasture has increased to 35 AU; the lightly grazed pasture to 40 AU; and the rotation-deferred pastures to 43 AU/section. (Fig. 1.)

Dr. Merrill (1959) summed up these data as follows: "Notice that the decline in carrying capacity had continued on the heavily grazed pastures; but in the moderate, the light and the rotation-deferred grazing pastures the decline has been halted and an increase in carrying capacity was obtained. It is significant to note also that even though 32

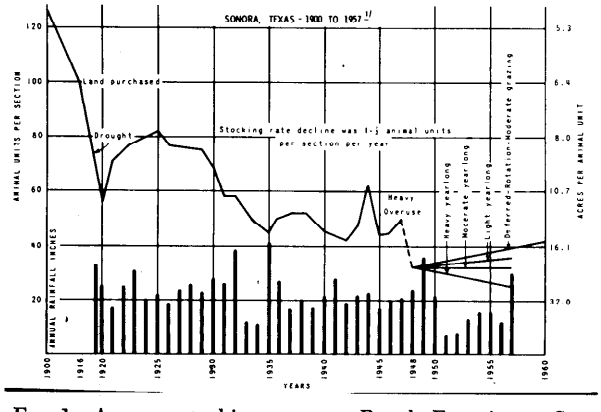

FIG. 1. Average stocking rates at Ranch Experiment Station near Sonora, Texas from 1900 to 1957 showing steady decline until improved management plan was started in 1948.

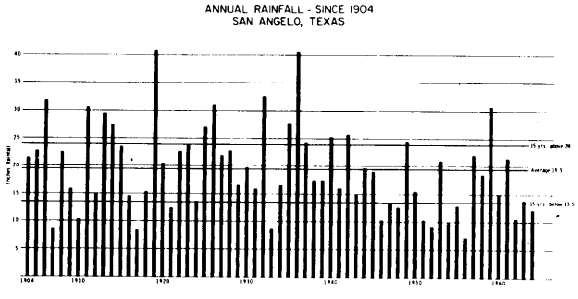

FIG. 2. Annual rainfall at San Angelo, Texas from 1904 to 1964, showing recurring drought periods.

AU were grazed on the rotation-deferred grazing pastures, the carrying capacity increased to 43 AU, whereas yearlong grazing of only one-half as many (16 AU) showed an increase to only 40 AU. How well this illustrates the value of good management systems that make it possible to increase livestock numbers that can be grazed on a given area and yet still permit range improvement."

We have thought at some length now about the impact that constant too heavy grazing plays in depleting range productive capacity. This is the human factor—one that could have been controlled!

Now let us look at the rainfall, temperature, and drought period factors. (Fig. 2.) We can't control these factors so we must adjust to them. The extremes in these variations and the recurring periods of drought shown on the chart should clearly indicate the urgency of flexibility in stocking rates in this particular area. The average rainfall during the past 60 years is 19.5 inches, but during 15 of those years or 25% of the time rainfall was less than 13.5 inches. During 20 years, the total was below 15 inches, and in five years it was below 10 inches. But in contrast, rainfall during 12 years was above 25 inches. These sharp peaks and recurring ups and downs can be considerably minimized by good management but it is periods such as 1950-1956 when the average for seven consecutive years was 12.5 inches or seven inches below the long-time average that really challenge our management skill and tenacity.

There are other factors which directly and often critically influence our forage production. The distribution of the rain is often even more important than the total amount received. The normal relative growth curve one might expect from warm season grasses under average moisture conditions is shown in Fig. 3. Many of these grasses normally make 70% of their year's growth by July 1 in this area. So we see the critical influence that the time rainfall comes and temperature play in affecting plant growth. It can be readily seen that the normal low rainfall and extremely high temperatures generally cut production a good 50% in August. If we don't get our spring rains, we seldom have a good crop of grass.

A review of all the factors that influence forage production leads us to realize that there just isn't any such thing as a safe constant normal carrying capacity in a country where three consecutive years of clipping tests showed forage yields of 1,361 lb, 980 lb, and only 371 lb/acre. Trying to stock constantly at a rate considered "normal" will surely bring on disaster in years of low production unless we have carried over some reserve grass through a deferred grazing system to cushion the extreme years.

It is unfortunate that many ranchers in our area, even now, continue to look upon range deferment somehow as a loss. They understand the principle of putting money in a savings account—just setting it aside to be enlarged in value—so that they might have a reserve for the emergencies of life. Still, they can't see deferment of the grass in their pastures as exactly the same principle! It is only set aside to reseed itself, to improve its vigor, and its root system, and to increase total tonnage to be used later—perhaps at a time when the need is far greater.

Now let us try to determine how the rancher can cope with these vexing and widely fluctuating forage production problems.

As we examine the forage production chart (Fig. 4), let us think of how best to manage a base or foundation herd suited to a given rainfall average and the expected forage which that level of rainfall normally should be expected to produce. Note that a base breeding herd suited to 1,000 lb/acre of range forage, over the years, would require little or no reduction except possibly during unusually dry periods such as the drought of the 1950's. But, this system of planned stocking rates does provide flexibility through opportunities to add stock during years of above average forage production. Thus, in the good or above average years the extra forage can be economically and safely utilized by increasing livestock in various ways that will be discussed later.

But never let us forget that if we try to set a constant stocking rate based upon an above average level—say of 2,000 lb—good years and bad, then we are surely heading for trouble, for this was so well illustrated in the records at the Sonora Station prior to 1948 (Fig. 1).

Referring once more to Fig. 3, we need to select a period in the

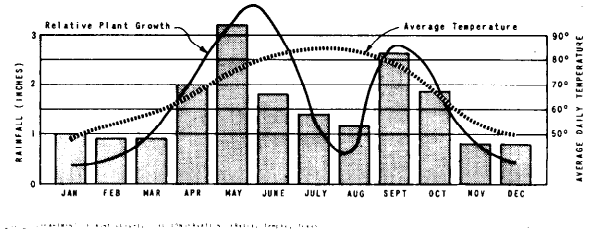

FIG. 3. Average monthly rainfall, temperature and approximate average forage growth curve at Sterling City, Texas.

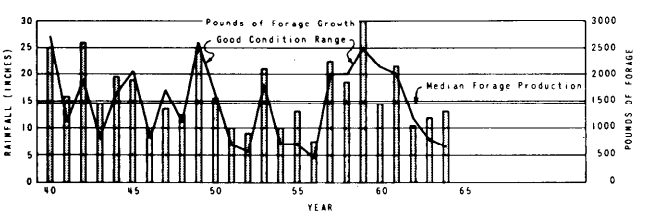

FIG. 4. Year to year fluctuations in forage production from 1940 to 1964 at Sterling City, Texas.

year, such as August in our area, when normally most of our seasonal forage production will have already been made. Now if we did not receive our normal rainfall in the peak production months of April, May and June, or if we have overused our production at this point; then we would surely need to begin reducing our breeding herd here (July-August) or as early in the summer as possible either by selling off a larger than usual percentage of older breeding stock, or else by not keeping the usual number of replacement heifers or ewe lambs. For, if normal rain has not come by this time in midsummer, then we are seldom able to grow enough grass in the fall to make up for the earlier lack of forage production. To ignore this condition at this time is to invite abused ranges and the resulting excessive winter feed bills.

In our own ranch operation we have for years used a plan that has proved both profitable and beneficial to our range. About August 1 we take inventory of both our available forage supply and soil moisture and then accordingly we stock our range with short-term ewes that we own only about nine months. If we have received average or above average rainfall, we might purchase as many as 200 solid mouth ewes per section (about 5 years old in our area). However, in extended below average rainfall years, 100 per section, or less, might be all we could safely carry. We breed these ewes to Suffolk rams, lamb them in February, shear the ewes, market the lambs, and then market the ewes. Then we rest the entire range for about three months and repeat the cycle.

We market the lambs at 110-120 days of age without regard to condition of lambs or the market. Lambs are normally about at their peak at this age and time—and lambs, like watermelons, must be sold when they are ripe. This pactice allows us to market before the lambs need drenching, shearing their eyes, etc. These are significant savings. More important, by always trying to maintain our range in a healthy condition we are generally able to market top lambs at this early age and thus get them off both grass and ewes. Every day that these lamb units and the ewes, too, are off the grass is money in the bank. In fact, we have come to see alert marketing as one of the more important facets of conservation ranching.

Using this system over a period of years has allowed us to run more animal units of sheep per section than most of our neighbors. During 7 of the past 9 years we have fed no supplement and yet we have produced good percentages of lambs at good weights. We put the money that would otherwise have gone down the drain in feed bills into brush control and water utilization where it continues to pay dividends for years. We have been amazed to learn what can be accomplished with our low rainfall average when the moisture is efficiently utilized.

Now obviously not everyone can or would want to use the same system we use. At present, we are building up a cow herd that may come to comprise 25% of our base herd as a constant factor. Then we will evaluate the forage supply in August and adjust or fill out with short-term ewes in our usual practice.

Ranchers desiring to raise their own replacements might use a similar system and adjust their constant factor with larger or smaller numbers of breeding stock or by varying replacement numbers, etc. Obviously the rancher using only dry stock has his problem greatly simplified.

We were in a brush control program for many years, in a minor way. The first of this work we did, and much continues to be done, under the Agricultural Conservation Program in our area. But it was not until 1959 and 1960 that we came to fully recognize that brush, with its relentless spread, its greedy consumption of vital water and nutrients, and its other attendant problems, was far too costly for us to tolerate longer. So, in 1960, through the Soil Conservation District program, we worked out a comprehensive brush control and range management plan under the Great Plains Conservation Program with the technical assistance of the U.S. Soil Conservation Service. Since that time, we have done a complete renovation job by controlling all noxious brush by dozing with a front-mounted "stinger" on a bulldozer. Smaller woody and noxious plants, such as prickly-pear and tasajillo, mostly have been hand grubbed. This was done on every acre of our 5,200-acre home place and was completed in 1964. The result has been an excellent recovery that we estimate to be a good 50% increase in productivity. We already have begun our plan to control noxious plant seedlings on a 5-year rotation cycle using a small D-4 "Cat." We plan to do some reseeding of native grasses, where needed, each time over in this rework.

In the summer of 1964 we acquired by inheritance an additional 1,800 acres of heavily brush-infested pasture in Coke County several miles from our home place. Since we had been so very pleased with the results of the Great Plains Conservation Program on our home place, the first thing we did was to work out a similar plan on this new operation, for it surely needed it. All forecasts were for above average rainfall in April, so we doubled up and did 2 years of

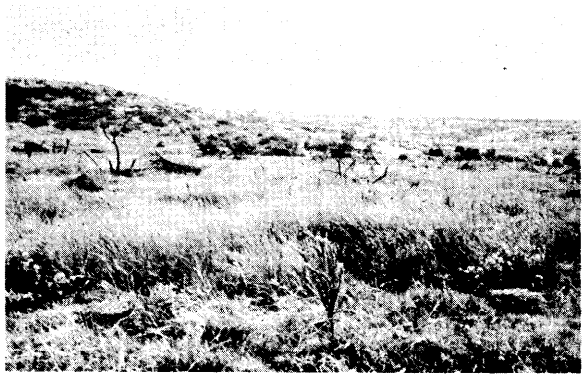

FIG. 5. This dense mat of nutritious sideoats grama and green sprangletop on the Skeete Ranch is the result of brush control, seeding and rest from grazing.

FIG. 6. This area formerly supported a dense stand of worthless brush with only a sparse cover of poor quality grasses and weeds.

our work plan in 1965 alone. The rainfall was good and we hit the jackpot. (Fig. 5 and 6.)

In recent years we have used the following precepts as guidelines toward more successful ranching:

1. Our basic production is grass and investments in improvement and restoration of grass are more important even than investments in improved breeding sires, or any other investment on the ranch.

2. Restoration of our present acreage is more practical than trying to purchase additional acreage.

3. Adjusting stocking rate to forage supply is basic to everything we do in planning.

4. This adjustment must necessarily be made before either range or stock suffer. We recognize that the range always suffers first and that it can happen before we detect it.

5. Above all, we do not want to get "married" to our livestock but rather to always keep at least a portion of this stock as expendables in critical drought periods.

6. Deferment is never a loss of forage—merely a period for increasing plant vigor and a forage supply for later use.

7. An orderly system of marketing stock is most urgent rather than continually trying to "out guess" the market.

8. There is no one poorer than a West Texas rancher who is always out of grass!

9. It is the rain you keep that counts; for unless we are efficient in this, we can't even hope to succeed in the others.

Brush control, maximum water utilization, deferred grazing, and proper range management by adjusting grazing to available forage, have all proved to be the most profitable and practical investments that we have ever made in the ranch business. Over the years, this has increased our productive capacity at a fraction of the cost of purchasing comparable additional acreage and without expanding costs of taxes and other fixed costs. For the usual range operation, our labor cost has been reduced a good 50%. Thanks also to the screwworm fly control program, our labor force is now more efficiently utilized. We have reduced or eliminated feed bills. Our production of wool and lamb has been consistently high. Obviously, we have invested considerable money for the size of our operation which is about average in our immediate locality. Yet, with the Great Plains Conservation Program cost-share assistance, these things have been accomplished and we are presently again operating on our own capital. Here, it seems to me, is the most practical approach to coping with the ever mounting cost of supplies, labor and taxes, and the competition of foreign meats and wool.

In closing, I want to say that the Great Plains Conservation Program with both the cost-share assistance and the technical assistance in comprehensive planning has proved, in my opinion, to be the finest educational tool that we have ever had in the field of conservation education. For here is indeed a very valuable tool that enables us to implement the very best educational, research and technical services of *all* our agencies, both State and Federal. To each of you agency people, educators, and research people, we say thank you for the services you have contributed to make our own work possible, and we hope that we will yet accomplish the level of conservation that you and I know is possible, if we ranchers will just diligently apply even the best knowledge and research presently available.

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