

My Experience with the Practical Application of College Training in Range Management

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McKee Ranch, Galisteo, New Mexico

I was not born into the ranching business, as is perhaps the case of the majority of ranchers, but am city born and reared. However, I became greatly interested in ranching at an early age, through working on ranches of friends during summer vacations and brandings, and visiting a cousin's ranch.

Without the aid of my father, financial and otherwise, acquisition of a ranch at present prices would have been nearly impossible. With his help, I began looking at ranches that were for sale, while I was still in high school. In looking over these ranches and other rangelands, I became aware of rather considerable differences in conditions of similarly situated ranges in the Southwest. Although some of the poor condition observed was perhaps due to drought, much of it appeared to be related to the management which had been applied. Through these observations and the advice of a friend who was in the professional range management field, I decided to take up the study of range management in college. It appeared that such training would be of benefit to me in the management of the ranch which I, with my father's help, planned to buy.

Following graduation from high school, I enrolled at New Mexico A. & M. in the fall of 1949. The

first two years of college, consisting of background and prerequisite courses, and not dealing directly with the subject of my main interest, created some doubt in my mind as to the practical value of the curriculum of study into which I had entered. I had a feeling, perhaps all too common among agricultural students leaning toward the practical, that any lecture, any reading assignment and laboratory exercise, that had no direct practical application in the field of my choice was a waste of my time and energy. I was perhaps expecting and wanting a vocational school type of course: exclusively on the applied and practical, without any regard for the fundamentals. I can see now, from the vantage point of time, that what I eventually got could not be built upon such a foundation. However, after prerequisites were out of the way and courses in range management and those with more direct bearing on range management were taken, my appreciation for and interest in the work increased.

During my third and fourth years of college, we began to look for a ranch in earnest, and it was late in the fourth year before we found what we wanted. The ranch selected is at Galisteo, in Santa Fe county, about 22 miles south of the town of Santa Fe.

Application of College Training in Ranch Selection and Management

Turning now to the application of my college training, I will first consider the matter of range condition on the ranch. College work had taught me that range condition is essentially the actual productivity and soil protection value of the range vegetation and stability of soil in relation to its own potential, the potential set by its own physiography and climate. Further I had learned that the condition of a range is in large measure the product of its past management, good or bad, and chiefly grazing management. The related concept of trend in condition or succession, I learned, is equally important and similarly rooted in grazing management as a basic cause.

Knowledge of range condition and trend was used, both in the process of selecting the ranch and in the subsequent application of grazing management. Actually the ranch was found to be in poor condition. Inferior plant species, mainly ring muhly, snakeweed, rabbitbrush, and a number of low value annuals made up an excessive proportion of the cover. Enough residue of the better species remained, however, to serve as a basis for a reasonably rapid recovery, that is, considering the limitations imposed by the southwestern climate. Gullies were present and the effects of wind erosion were quite obvious. At present the condition is still only fair, but there are signs of continuing improvement. Gullies are showing signs of healing over and reproduction of the better perennial forage grasses

is noticeable. Our grazing management is aimed at furthering this improvement as fast and as far as possible.

Grazing Capacity Determination

Determination of the proper stocking was given careful consideration in setting up the management plan on the ranch. To some practical ranch operators, the emphasis laid on grazing capacity determination and commensurate stocking by most professional range managers may appear as an obsession. However, my training was quite convincing on the importance of proper stocking, both to the maintenance and improvement of the range and the productivity of the livestock. Ample supporting evidence and explanatory material from plant ecology, plant physiology and animal nutrition, as well as from grazing experiments and results from practical ranching operations had been presented on the subject.

In determining the grazing capacity of the ranch, I followed the standard range survey procedure, done on an extensive basis on horseback. From the field data, usable forage was computed, using appropriate proper use values and discounting for reduced accessibility of range to livestock where needed. This procedure yielded grazing capacity rates of from 6 to 12 animal unit years per section, depending upon the place-to-place variation in the several factors going into the determination of grazing capacity.

I supplemented or checked these results by comparison with grazing capacity values available for rangeland near Corona, New Mexico, under similar climatic, topographic and vegetation conditions. The Corona range has a capacity of from 8 to 15 animal unit years per section, depending on local factors. The final capacity rate arrived at and used for the ranch was 8 animal unit years per section. This job was time consuming, but I consider the time well spent as it gave much information needed

in the management of the ranch at the outset. The results quite probably depart some from the true capacity value, but they are better than an unsupported guess, in my opinion.

Improving the Ranch

Improvements on the ranch when it was acquired were very inadequate. Only two wells were in operating condition. Seven earth tanks completed the stock watering system on the ranch, but all except one were so badly silted that they did not serve their purpose except for a few weeks after filling. These tanks were well located, however, and after cleaning, have served quite well. Five new wells have been drilled and these, with the reconditioned original waterings, now constitute a fairly satisfactory watering system. Three miles is about the maximum distance between waters at present. Livestock distribution and grazing use have been much improved over what they were originally. Every practical rancher appreciates the value of a well distributed system of stock waterings and it takes no formal training to make him aware of the fact. The point was presented in course work, however, with due attention to the fact that it takes an adequate watering system to transform inaccessible, unavailable vegetation into properly usable forage without excessive walking on the part of the livestock and damaging grazing about the too-few waters of an inadequate system. Even though a range may be as well watered as economically feasible, outlying areas must be discounted from full grazing value because of reduced accessibility to livestock.

Two important factors influencing well locations and usefulness were encountered in developing the new watering system which were not touched upon in my range management training. These are availability and quality of water at a proposed well location. Quality of water varies greatly on the ranch and must be considered in

connection with the matter of composition of range vegetation and season of use. As an example, we have one pasture on the ranch composed chiefly of alkali sacaton, the best season of use for which is spring and summer. Well water in this pasture is so salty, however, that cattle will drink sufficient amounts of it only in winter when the weather is cool and their water requirements are lower. Earthen tanks that would fill from summer rains are not the solution here, as drainage area is insufficient.

As with the stock waterings, fences on the ranch were in very poor condition at the time of purchase. Most of the exterior boundary fences were in such poor condition as to require complete replacement. Only two pasture division fences were present. Fortunately both were in a fairly good state of repair and so located as to fit into our pasture development plans. These plans call for the location of fences with chief consideration on the following points: availability of water, both present and future developments; topography—fencing rough, rocky rangeland apart from the gently rolling range, so as to prevent excessive congregation of stock on the more gentle topography; and vegetational types—fencing vegetational types apart which are best used at different intensities, or seasons, or which exhibit different values to grazing animals. This latter point was brought out in course work as being particularly important in the Southwest, where rangeland commonly exhibits a mosaic-like pattern of vegetational types which may be managed for maximum production and conservation only by separating them into different pastures. New fences are being constructed following these considerations as opportunity permits.

Grazing Management

The grazing system in use on the ranch is in reality a combination of two more elemental systems: the deferred-rotation system and the seasonal suitability system. This

latter system is one in which pastures are stocked at seasons when their forage is most palatable and nutritious to livestock, when pastures are best used from the standpoint of maintenance or improvement, or when they fit into a pattern in which other pastures are used seasonally according to the above considerations. Thus an alkali sacaton pasture is best used in summer, when this species is most palatable and nutritious to livestock, a pasture supporting a good stand of chamiza is used in winter or spring when this species is most valuable to livestock in this section. Pastures consisting chiefly of blue grama, black grama, side-oats grama, etc. are used when they best fit into the seasonal needs or advantages of the other pastures. No attempt is made to rotate season of use under this system; the winter pastures are deferred until winter each year and the summer pastures are summer grazed each year. The deferred-rotation system is used only on those pastures which are properly subject to rotation in season of use and deferment. The combination of the two systems seem to afford the opportunity for harvesting the forage to best advantage, considering both range and livestock.

Grazing Herd Flexibility

A point which received major emphasis in course work is the wide and erratic variation in annual forage production characteristic of Southwestern rangelands and the grazing management problem presented to the rancher. While we have not been on the ranch long enough to accumulate our own records on this point, there is no reason to doubt that the same variation applies to our area. Accordingly, our total stocking of 386 animal units is divided into a breeding herd of 217 animal units and a "floater" herd of 169 animal units, consisting of 141 short yearling steers, 68 short yearling heifers and 48 two-year-old heifer replacements.

Thus at present we have a down-

ward flexibility of about 70 animal units or 18 percent of total stocking represented by steers, about 34 animal units or 9 percent of total stocking represented by heifer yearlings and about 38 animal units or 10 percent of total stocking represented by two-year-old heifers. If our stocking is about right for average forage production, with this herd breakdown, we can get through on an 82 percent forage crop simply by letting the steers go. By also letting the heifer calves go, we can get by on a 73 percent forage crop and by letting our two-year-old heifer replacements go, we could "tough it out" on 63 percent of the average crop.

All these adjustments can be made without cutting into the breeding herd. I do not want to imply by the percent figures that we expect to appraise forage production as accurately as 82, 73 and 63 percent of average. They simply show the downward flexibility produced by our present herd composition.

Classroom data in range management reveal that forage crops as low as 50 percent of average on Southwestern ranges are to be expected and should be anticipated in range management plans. The last few years in the Southwest have witnessed years of considerably less than 50 percent of average production. Our present stocking may actually be a little high in relation to the long time average; however half the "floater" herd was purchased this past February in order to utilize surplus forage from the 1955 growing season. They will go when the surplus forage is gone.

Forage Reserve Essential

We are operating with a forage reserve, that is forage produced in one growing season is carried over for use in the following growing season, against the possibility of late or deficient growth in the second season. This management practice was strongly recommended in course work. With a reserve, we

can carry some more stock in a year of low forage production than that year actually supplies. At present our reserving is limited to three small pastures, as these are the only ones suited to the practice. When our fencing program is further along, we anticipate improvement in our reserve practice in that we can then rotate the reserve around among different pastures, which will be a considerable improvement in the practice.

An appraisal of the range forage crop has been made each fall as a basis for making stocking adjustments. This is, of course, a necessary "follow-up" of the herd composition plan pointed out. The appraisal is conducted on an ocular estimate basis, using some Soil Conservation Service study plots as a basis for comparison. It is expected that with more experience on the range, our estimates will improve in accuracy and provide a sound basis for making necessary stocking adjustments.

Appraisal of Grazing Use

Another range management practice given emphasis in college work and carried out on the ranch is an appraisal of grazing use. This is done on a continuing basis, while traveling over the ranch to observe or move cattle and to put out salt-meal at feeding stations on the ranch. The appraisal is made on an ocular-estimate basis which has been found adequate to our needs. As utilization is found to be complete on areas, cattle are shifted by riding and relocation of the feeding stations to areas where use is less than proper. Valuable by-products of our utilization observations are the indications we get on need for additional watering places.

With our as yet incomplete fencing program, livestock distribution is certainly not all that could be desired. However, the practice of using the outlying salt-meal feeding stations has done much to improve distribution. In fact we have realized more grazing capacity from the range by using this prac-

tice than we would if it were not in use.

In spring, when grass first begins to green up, the salt-meal stations are not nearly so effective in maintaining distribution as at other times of the year. At this time even riding has not helped much. Without fences to provide absolute control, the cattle will congregate on areas showing the earliest new growth. A certain amount of concentration on areas of freshening grass is probably not harmful to the range and is certainly beneficial to livestock, but it can easily reach damaging proportions if not controlled.

We have not as yet had occasion to use such other range management practices as reseeding, rodent control, water spreading, and erosion control and brush control, as there are no pressing problems which seem to require the use of these. At least, development of waterings and pastures and attention to proper grazing management has taken priority over them to the present, as we believe they should under the circumstances prevailing on the ranch.

Livestock Management

There are two livestock management practices which we are using and which appear to be quite advantageous in our operation. The first of these is the feeding of a supplement designed to balance or correct a qualitative deficiency in the range forage at certain seasons of the year. This salt-meal mixture contains 32.5% crude protein, 2.5% crude fat, 7.5% crude fiber, 19% nitrogen-free extract, 4% calcium, 1.5% phosphorus, 17% salt, .015% iodine, 100,000 units of vitamin A per pound, and traces of vitamin D and B-12, the so-called "trace minerals" and terramycin. This salt-meal mixture is used to

improve distribution on the range. Ingredients of especial value are the phosphorus and vitamin A, as the soil in the locality is very low in phosphorus, and vitamin A is low in the forage in late winter and early spring. The supplement is of considerable value in reducing calving troubles and pink eye and in improving general health and vigor. Our records show that consumption of the supplement begins in November with a consumption of a little over one-eighth pound per day and rises gradually to about a half pound per day in February and then sharply to one and a quarter pounds per day in April, after which it decreases sharply to about one-eighth pound daily in May or June. The sharp rise and drop in consumption coincides with the disappearance and reappearance of green feed on the range. The cattle do not take the supplement at all during the summer months unless it is extremely dry and green forage is almost entirely lacking.

In our breeding program, selection of replacement heifers is on a weight-for-age basis. Also replacements are bred only after reaching a certain size rather than at a certain age. These practices are aimed at producing cattle of fast growing ability and reducing calving difficulties with the heifers. The bulls used are feed-lot tested for rapid gaining ability and are dwarf free.

Resumé

To return to the matter of college training and range management, I believe that my training in range management has been a very definite benefit to me, first in the selection of the ranch and now in its management. I am sure that any rancher who really understands range management also realizes that it is a complicated field of endeavor, requiring years of ex-

perience to master. In my case, I believe that it would have taken me eight or ten years of practical experience to have acquired what I obtained in course work. Furthermore, there are certain important fundamentals in the fields of plant ecology, plant physiology, animal nutrition, etc., which I simply would not have gotten from practical experience.

It is my belief that all ranch managers should have formal training in range management if at all possible. The reason I say this is twofold. First, it is a complex field; second, if the complexities are not understood and taken into account in the management of the range, the resource is simply lost or greatly diminished in productivity. The federal government agencies in the field of range management, the state experiment stations and extension service all stand ready to help the individual rancher with his problems, but they can not do this on a scale or intensity sufficient to get an adequate job of management done on all rangeland. Each ranch presents its own peculiar problems which require careful and continuing attention for their proper solution. Only the individual rancher right out on the range has the necessary time to do this job, so it is he who must be well enough informed to do an effective job.

In conclusion, I would like to make it clear that I do not want to imply that college training will provide solutions for all the many important problems that arise in the management of the range. It does not and should not be expected to. This is where practical experience enters in to round out the training picture for the ranch operator. Ideally, formal training and practical experience work as a team to complete the overall training of the range manager.