PROCEEDINGS OF THE NINTH

RANCH MANAGEMENT CONFERENCE

October 8, 1971

INTERNATIONAL CENTER for ARID and SEMI-ARID LAND STUDIES

CONTRIBUTION NO. 101

RANCH MANAGEMENT CONFERENCE

October 8, 1971

Farmers Coop Compress

3800 Southeast Drive

Lubbock, Texas

9TH ANNUAL

RANCH MANAGEMENT CONFERENCE

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Lubbock, Texas

October 8, 1971

8:00 Coffee and registration.

MORNING SESSION

Presiding: Joe Norris

9:30 Introductory Remarks -- Tom Copeland.

9:45 Welcome -- Dr. Grover E. Murray and Dr. Anson R. Bertrand.

10:00 Management of Blue Grama Ranges -- Dr. Robert E. Bement.

10:50 Grazing Management on the Adam's Ranches -- Dick Whetsell.

11:30 Catered, Dutch-Treat Lunch.

AFTERNOON SESSION

Presiding: Roddy Peeples

1:00 Horses in Today's Ranching Industry -- Benton Watson.

1:30 Site Characteristics and Phenological Development of Mesquite -- Dr. Billie E. Dahl and John P. Goen.

2:00 The Composition of Range Forage Plants and Nutrition of Range Cattle -- Dr. John H. Knox.

2:45 Coffee.

3:15 Preconditioning Range Cattle Prior to Putting Them Into The Feedlot -- Pat Shepard.

4:00 Adjourn.

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MANAGEMENT OF BLUE GRAMA RANGES

Robert E. Bement

Plant Science Research Division
Agricultural Research Service
United States Department of Agriculture
Fort Collins, Colorado 80821

The rancher who stocks his range during the period when he expects it to make its growth must be equally concerned about forage harvest and forage production.

The quantity of forage available to livestock, and the use they make of it, affect grazing efficiency. At Central Plains Experimental Range maximum daily beef gain was reached when pastures were stocked at rates which left at least 350 lb. of ungrazed herbage standing on the pasture at the end of the 6-month summer grazing season. Maximum gain per acre was obtained at stocking rates leaving 250 lb. of ungrazed herbage. Maximum cattle return ($/acre) occurred when 300 lb. of ungrazed herbage remained at the end of the grazing season.

Blue grama ranges usually make their herbage growth in brief spurts when moisture becomes available. The amount of leaf tissue working during these spurts of growth affects the quantity of herbage produced. For optimum forage production, blue grama ranges should be managed to provide sufficient leaf tissue to insure fast herbage growth when a growth opportunity occurs. The amount of standing vegetation gives a good estimate of the amount of leaf tissue present during a given growth period. At Central Plains Experimental Range, fast herbage growth occurred with adequate moisture and at least 300 lb/acre of standing vegetation on the range.

Both optimum plant and livestock production were made when 300 lb. of herbage per acre were left ungrazed. The key to stocking rates and grazing systems on this kind of blue grama range is leaf weight management, to maintain 300 lb. of herbage per acre during the growing season.

GRAZING MANAGEMENT ON THE ADAMS RANCH

Dick Whetsell
Manager, Adams Ranches
P. O. Box 66
Foraker, Oklahoma 74638
Osage County, Oklahoma

Considerable progress has been made during the past 20 years in all phases of ranch management. Disease prevention and treatment and parasite control has added many dollars to ranch income. Better preforming seed stock and cross-breeding has added pounds of beef at lower costs. Nutritional guides for proper levels of wintering have saved ranchers many dollars. Spraying for weed and brush control has added many tons of range feed. New strains of grass and better use of fertilizer has increased forage production and added many months of grazing.

However, these changes and improvements and many others not mentioned have not shed much light on the basic problem in ranch management of how to balance cattle numbers with grass production in the most profitable manner on a continuing basis. Each fall as we consider our stocking load for the next twelve months we still ask ourselves, will it be a wet year, dry year or one of the normal years. And if so how many acres will it take per cow, steer, and replacement heifers.

We ranch in the Osage hills of North Central Oklahoma on the south end of the flint hill country that is well known for its fine bluestem grass. The average annual rainfall is 35 inches and during the past 15 years this has varied from a low of 16 inches to a high of 40 inches. Therefore, one of our problems is how to stock a productive range site in good to excellent condition that will be most profitable year after year. After working as a range technician for 15 years and managing a ranch for 16 years, I am convinced there is no easy and perfect formula for making this determination.

Under similar sites and conditions grass production is more closely correlated with rainfall than with any other condition. At the present time no one seems capable of accurately predicting just how productive our rainfall will be for the next 12 months. Even when we guess the total we always miss the pattern of distribution and the intensity.

After several years of trying to determine stocking rates by many other systems I finally settled on one we will call the PYG system. With this system "Past Years Growth" determines next years stocking rate. For example, our stocking rate for 1969 was 8 acres/cow. As we studied our ranges that fall we decided that growth was below normal. So we added 1 acre and stocked for 1970 at 9 acres/cow. Under this system if grass growth is normal you continue at the same rate. If growth is below normal you add an acre and if its' above normal you deduct an acre. By following this system our stocking rate varies from a low of 7 acres to a high of 10 acres/cow unit. This means that you are always one year behind going into a dry period and you will be one year ahead coming out of a dry period.

In our area with bluestem grass and our rainfall pattern this system of grazing has enabled us to produce beef at a profitable rate while maintaining or improving our ranges. It is usually the Managers job and responsibility to know whether or not a new practice or idea will fit his set of needs on his particular unit. The above system may or may not fit your needs but I will state that after working with a set of good cowboys for the past 15 years I am convinced even a poor system is better than no system at all.

HORSES IN TODAY'S RANCHING INDUSTRY

Benton Watson

Public Relations Assistant
American Quarter Horse Association, S.P.O.
Box 200
Amarillo, Texas 79105

The evolution of the horse is quite an interesting story and dates back some 55 million years; however his usefulness to man is our prime interest and involves a much later era in history. The horse has come a long way since he was first used some 25,000 years ago as simply food for man. The first record of the horse being domesticated was about 2,000 B.C. when he was used to pull chariots and man first began to realize that here was a potential source of power that could prove most useful. From that date to now, the horse has served as man's faithful servant; to bring the first of the adventuresome pioneers to this part of the country; in war; and of course as the key to the ranching industry.

But the role of horses in todays' ranching industry is rapidly changing. You and I know well the day is past when the rancher depends on the horse exclusively for his means of transportation and for many of the everyday chores performed on the ranch. The horse has taken a new role in todays' complex ranching industry and in this new role, is just as much an integral part of the overall program as ever.

You as a rancher daily seek new means to make the ends meet and new revenues of income. I would be the last to stand before you and suggest you go buy a $100,000 stud and stand him as a means of new income. Or pay $50,000 or more at next year's All American Sale at Ruidoso with the idea of returning the next year and winning $200,000 in the All American Futurity. It has been done and certainly there is a place for the racing industry, but the average rancher just can't afford to take these kind of chances.

But there is a horse market into which each and everyone of you can fit. That is the youth market. We see an ever increasing number of young people getting into the horse business daily. Most on a small scale with 1 to 3 horses. A large percentage of these kids live in town and will be keeping their horses at stables. They have convinced their parents of the wholesome entertainment for the whole family in owning a horse. And may I say, more power to them. It sure beats some of the other choices our young people of today have the opportunity to participate in.

The youth horse movement is just getting started. For example, the American Junior Quarter Horse Association was organized a year ago in August. There are now over 4,000 members in AJQHA from 40 states and 2 Provinces in Canada. The 4-H Club people tell us that their horse projects are the fastest growing of any they offer. Other horse breed associations realize the great future of youth activity programs.

So, I say the rancher of today needs to gear for tomorrow when one of the youngsters will be paying a visit to your ranch to select that first mount.

Now, here is where the rub comes. In the first place, the majority of parents with these youngsters have no earthly idea what a horse is worth. They wouldn't know Easy Jet from Prince Domino. They have no idea how long it takes to train a roping or reining or cutting horse. Or they have no idea how to break a horse. Sure they will tell you they have ridden horses all their life and they know how to break one. Probably what they are talking about is they have read one of the breed associations promotional booklets on how to train a horse and they think they can follow this book and train a horse in a few days.

So this is where you are going to need to give them some guidance to assure their first experience in horse buying will be a pleasant one. None of us would want to sell one of these youngsters a horse that is too much for him, and possibly get him hurt. Let's be realistic. Most of these people are simply looking for a pleasure horse to start with. They will be back later for the horse trained in some event. And they will come back to you for that next horse if you treat them right the first time. I believe the sale goes beyond the exchanging of money. Offer to help these people with selecting feed. Tell them you will be glad to visit their place and help with planning stalls, feeding facilities, etc. The point is.....make them feel you have an interest beyond the sale.

Try your best to determine just what the buyer plans to do with this horse. If you do not feel the horse has the conformation to do good in a halter class, tell the buyer. Explain to him that as he progresses in the horse business, he may want to upgrade his program by looking to horses with better breeding, etc. There is nothing more heartbreaking than to see a youngster lead a horse into a show time after time-and time after time get the gate because someone has sold him a horse and convinced him it is a good halter horse. This could very well mark this youth for life. Or he may have paid an outrageous price for the horse. And here again, is where we need to use a little descretion. Sure we are in the business to make money. And the buyer expects you to be making a profit when he selects a horse. But let's not try to get rich quick. Remember, if these people stay in the horse business long enough, they will be able to look back and see if you made them a good deal. They don't expect you to guarantee them winnings. But they are looking to you as the expert. Don't disappoint them.

This time last week I was attending the Second Annual Convention of the American Junior Quarter Horse Association in Dallas. I wish each and every one of you could have sat in on the discussions held by these young adults, 18 years of age and younger. It was one of the most impressive events I have attended in a long time. These kids are sharp. I realize we had the so-called "cream of the crop" at this meeting. But the ideas and beliefs that they expressed exhibited to me sound thinking that many try to tell us the younger generation doesn't have any more. Don't sell these kids short. They have a lot on the ball. And in the near future it is very likely they will be coming to you for help and advice. Take a few minutes. Visit with them and share ideas. I dare say you will learn something also.

Yes, the future is bright for horses in the ranching industry. But the ranching industry needs to realize that this great market will be only as good as you make it. Someone has said that by 1975 over 82 million Americans will ride a horse at least once. It is up to you to see that they are properly mounted.

SITE CHARACTERISTICS AND PHENOLOGICAL DEVELOPMENT OF MESQUITE

Bill E. Dahl and John P. Goen

Range and Wildlife Management
Texas Tech University
Lubbock, Texas

Pilot research conducted in 1968 and 1969 on small plots to evaluate the role environmental factors play in controlling honey mesquite (Prosopis glandulosa var. glandulosa) with 2,4,5-T (2,4,5 Trichlorophenoxyacetic acid) indicated that soil temperature and stage of growth were the two factors most responsible for root kills. Surprisingly, other factors considered important to high root kills such as: soil moisture, relative humidity, time of day, and air temperature were of secondary importance and only indirectly influenced herbicide effectiveness (Dahl et al., 1971). To find out if these results could be duplicated under field scale herbicide applications, aerial applications of both 2,4,5-T and Tordon 225 (picloram + 2,4,5-T) were followed on 10 ranches in the rolling plains from Matador to Water Valley, Texas in 1970. Twenty five trees per site were tagged and checked for mortality on 42 sites from these ranches. Environmental factors measured at the time the herbicide was applied included: soil temperature, stage of growth, flower abundance per tree, soil moisture, relative humidity, air temperature, depth to $CaCO_3$ effervescence with HCl, time of day, tree diameter, and tree height. Root kills following the second growing season were obtained the last week in September, 1971. Any green material on the base (or stem) of a tree, regardless of size, was evidence that a tree was alive.

The influence of site on the development of mesquite and how site characteristics influence reproduction is also needed so that we may better understand the interrelationships of site factors, stage of plant development and the optimum time to get maximum mesquite kills with growth regulating herbicides. Therefore, 25 mesquite trees from each of 6 sites have been observed on the Post-Montgomery Ranch, Post, Texas during 1970 and 1971.

Results With 2,4,5-T and Discussion

Soil temperature was the dominant influence affecting root kills with 2,4,5-T in this study. Depth of temperature measurements anywhere between 12 and 24 inches were about equally effective with measurement at 12 inches best. In no case where soil temperature was 74 F or lower, did mesquite root kills exceed 12%. This was an overriding factor affecting the results of all other environmental characteristics measured. By this we mean, that when soil temperatures were below 75 F, regardless of soil moisture, plant phenological development, air temperature, time of day, etc., essentially no root kills were obtained with 2,4,5-T (Fig. 1a).

Abundance of flowers on a tree was secondary to soil temperature in determining root kills, i.e. the more abundant the flowers the poorer the root kills (Fig. 1b). Trees loaded with flowers were regarded as having 100% flowers, those with no flowers as 0%, the intermediate degrees of flowering rated subjectively on a sliding scale from 0-100%. However, the Post-Montgomery Ranch study indicated that the warmer the site the higher the percentage flowers so we have some confounding of the effect of flower abundance and soil temperature that is not readily separable at this time. Mesquite root kills never exceeded 12% on those sites where the flower abundance values averaged greater than 17%. Therefore, as in the 1968-69 study, soil temperature and stage of growth are dominant influences affecting mesquite root kills with 2,4,5-T. The major exception is that soil temperature appears now even more influential than it did in the 1968-

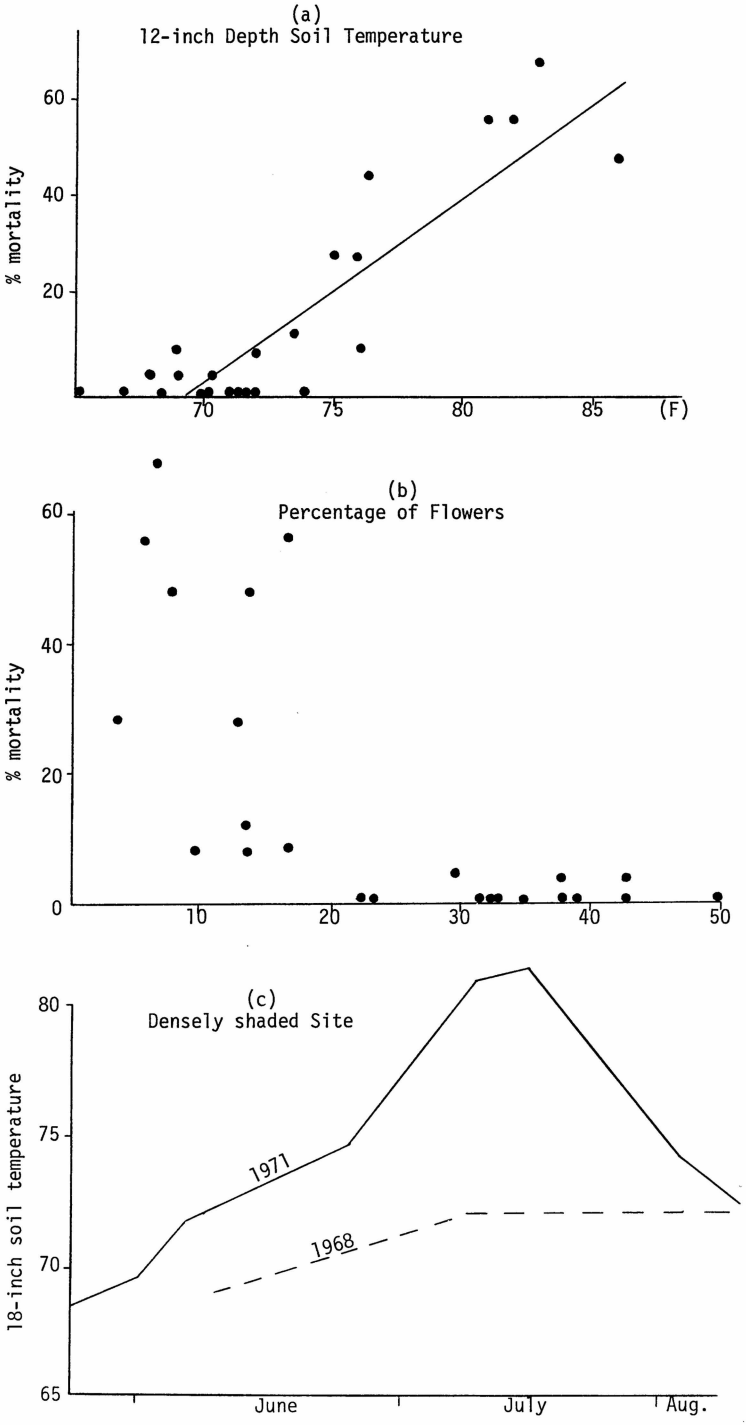

Fig. 1. Influence of soil temperature (a) and percentage of flowers (b) on mesquite mortality from 2,4,5-T. (c) Influence of dense shade on soil temperature.

69 pilot study.

If we study only those sites with soil temperature above 74 F some interesting relationships appear. Soil moisture becomes quite important, but in a negative way. The lower the soil water content the better the mesquite kills, which is not what we have thought in the past. Apparently, dry soils warm up faster and to a higher temperature than wet ones, hence the negative relationship. In fact, our highest kills occurred on sites with soils at the wilting point, i.e. with no usable water available to the plant in the top 2 ft of soil. Fig. 1 (c) shows that soil temperatures in a densely shaded wet site in 1968 never reached 74 F and it only did so when soil moisture was more depleted as during the drought of 1971. This suggests that droughty conditions during the spring and early summer could possibly increase mesquite kills with 2,4,5-T on sites that, with adequate spring and summer precipitation, are normally wet and cold.

Although some apparent relationships exist between root kill and time of day, air temperature, relative humidity, etc. our data indicates that until further work can be done with these variables, they may be largely ignored if soil temperature, stage of growth, and soil moisture are closely watched. However, air temperatures over 90 F appear to reduce root kills probably because of volatilization of the 2,4,5-T and reduced physiological activity of the plant.

Literature Cited

Dahl, B. E., R. B. Wadley, M. George, and J. Talbot. 1971. Influence of site on mesquite mortality from 2,4,5-T. J. Range Manage. 24:210-215.

THE COMPOSITION OF RANGE FORAGE PLANTS AND NUTRITION OF RANGE CATTLE

John H. Knox

Professor Emeritus of Animal Science
New Mexico State University
Las Cruces, New Mexico 88001

We hear much about the deficiencies of range forage and how to correct them. It is proper that we consider these matters for here is where much of the need for action lies. However, it is well that we pause to consider the remarkable properties of our native ranges and the ruminant animals that graze them.

Ruminants thrived on these ranges centuries before the stockman arrived. They were attuned well to their environment. Nature had equipped them to use the coarse forages. By means of bacteria in the rumen they were able to provide certain vitamins which other animals must receive from their feed. Ruminants can synthesize needed amino acids even to the extent of using nitrogen from inorganic sources such as urea, so that quality of protein, so important in nonruminant nutrition, is not a problem.

Their reproductive cycles were adjusted to the seasonal conditions of the forage. They traveled from one range type to another as seasonal changes dictated. They moved from place to place when spotted rains fell. When the range became overstocked or suffered from severe drought, reproduction was depressed and death rates among the older and weaker individuals increased. We can learn from these adjustments in nature. Failure to do so results in increased feed bills and depleted ranges.

Although perennial grasses will be discussed as a group, there are differences in composition and seasonal use worthy of mention. Some grasses such as the sacatones and the aristidas mature early. Others such as the gramas and the panicums cure well and provide usable forage in the dormant season. Black grama is especially notable in this regard. The stems remain green throughout the winter. On the other hand, tobosa and galleta become coarse and low in palatability when dormant, while the soft-stemmed dropseeds shatter badly in the winter winds. In spite of such differences, most grasses follow a general pattern in their development. They start the growing season high in moisture content with their dry matter high in protein, minerals and carotene from which vitamin A is formed; but low in dry matter, fiber and energy.

Changes occur progressively throughout the growth period. Fiber and energy increase with a corresponding decrease in the percentage of other constituents. As grasses approach maturity their usual abundance and adequate amounts of most essential nutrients usually provide excellent nutrition for grazing animals. Then is when calves and yearlings put on flesh in preparation for market and the breeding herd does so for shortages which may develop later. The exception in this good picture is phosphorus which is deficient in range grasses in nearly all situations in New Mexico, at least, and probably throughout most of the Southwest. During the dormant season much of the more digestible nutrients and phosphorus and carotene are gradually lost by weathering.

Forbs, both annual and perennial, contain a higher percentage of protein and minerals than grasses. Most of the perennials retain these nutrients to a higher degree than grasses in the dormant period. Many annual forbs are cool weather plants which may grow under favorable winter and early spring conditions providing necessary nutrients at a time when grasses are most deficient.

Shrubs, although woody in nature, have many of the qualities of perennial forbs with the added advantages of retaining nutrients to a greater degree in prolonged droughts and providing available feed in heavy snow storms.

Table 1. Composition of Some Texas Grasses, Texas Bul. 1044

Grasses	90 Percent Dry Matter Digestible Protein	Digestible Energy
	%	Megcal/lb.
Bluestem, Texas		
Young	3.5	1.19
Bloom	1.8	1.08
Mature	1.9	1.12
Buffalograss		
Young	5.2	1.10
Bloom	1.6	0.82
Mature	1.4	0.86
Dropseed, sand		
Young	6.4	1.02
Bloom	3.3	1.13
Mature	2.5	1.13
Grama, blue		
Young	5.7	1.12
Bloom	3.8	1.00
Mature	1.2	0.73
Grama, side-oats		
Young	5.8	1.10
Bloom	3.2	1.05
Mature	1.3	0.88
Mesquitegrass, curley		
Young	4.2	1.03
Bloom	2.2	0.87
Mature	1.0	0.76

Table 2. Composition of Some Range Plants-Mature State
N. M. Exp. Sta. Bul. 561

	Percent of Dry Matter					
	Protein	Ether Extract	Acid Detergent Fiber	Acid Detergent Lignin	Cal-cium	Phos-phorus
Grasses						
Black grama	5.8	1.6	44.1	7.0	0.32	0.12
Messa Dropseed	7.6	0.4	52.0	8.2	0.26	0.13
Tobosa	9.2	2.0	43.2	6.8	0.39	0.16
Forbs						
Leatherweed	13.9	5.9	33.9	13.0	1.66	0.18
Wooly Paperflower	14.4	2.7	56.1	5.8	2.48	0.14
Russian Thistle	16.2	1.1	31.5	8.2	2.53	0.20
Shrubs						
Chamiza	13.4	1.2	36.6	8.7		
Mesquite Beans	12.9	1.8	46.2	9.4	0.56	0.19
Yucca elata	10.8	2.9	36.0	10.4	1.43	0.16

Fortunate is the manager who has a range with a variety of grasses, palatable shrubs and forbs in season. However, an over abundance of the latter and large amount of noxious shrubs may indicate a depleted range.

A brief review of the nutritional requirements of cattle related to the composition of range forage should give a background for outlining the need for supplements. We are all familiar with the fact that animals must receive energy, protein, minerals and vitamins from their feed. Energy is required in greatest amount for all life processes: maintenance, growth, reproduction and lactation, as well as energy to gather more food to provide more energy. This pressing need is provided for, to some degree, by the animal's ability to store energy as body fat in favorable seasons to provide for emergencies and the demands for reproduction. Grazing animals get most of their energy from carbohydrates including fiber. Ruminants are especially well equipped to derive energy from fiber which makes up more than 40% of the dry matter in range forages.

Some protein is required for maintenance but it is needed in larger amounts for growth, reproduction and lactation. Animals need protein in their regular diet for they have a very limited reserve. Experiments in Texas and elsewhere have shown that protein supplements may be fed as infrequently as twice a week without loss of effectiveness. Range grasses are low in protein when dormant, a condition which may be improved considerably by the presence of palatable forbs and shrubs.

Animals require many minerals. Salt, calcium and phosphorus are needed in considerable amounts. The other minerals are all classified as trace minerals because of the small amounts present in most plants and the small amounts required by animals. Certain trace minerals are lacking in some regions, but many analyses have failed to show any deficiencies on New Mexico ranges. Most plants are deficient in salt. Calcium and phosphorus are present in body tissues and fluids and they are the principal constituents of bone. Although calcium is present in larger amounts, it is seldom lacking in the diets of range cattle. While grasses are only moderate in calcium content, this mineral is abundant in other plants as shown in Table 2. The situation is much different with phosphorus. Range grasses are almost universally low in phosphorus and the condition is not greatly improved by the presence of other forage plants. Analyses of range plants and of the blood of range cattle over a long period have demonstrated a deficiency of phosphorus in all parts of New Mexico.

Of all the vitamins, A is the only one which cattle must receive from their feed. It is abundant as carotene in all green grasses and well cured hays. With few exceptions, black grama being the most notable, carotene may be entirely lacking in dormant and weathered grasses. Most perennial browse plants retain some carotene through the winter. This combined with storage of vitamin A in the liver greatly reduces the need for supplements.

The question of proper supplemental feeding involves economics as well as nutrition. There are two principal reasons for using supplemental feeds. One is to correct nutritional deficiencies in the forage. The other is to make up for a lack of forage -- one qualitative; the other quantitative. The first is technically sound and is usually economically profitable. In its simplest form it is practiced by all stockmen when they provide salt for range cattle. The second purpose substitutes purchased feed for that normally produced on the range. Except in severe storms and rare emergencies, it can not be considered a desirable practice. The necessity is usually caused by a failure to make needed adjustments in stocking rates before the emergency arises. It is true that supplements are more available than formerly, especially on isolated ranges, and that the price of rangeland has increased more rapidly than the cost of feed. These changes have caused logical changes in feeding practices. In spite of this, recent economic studies in New Mexico demonstrated that less is spent per animal unit for purchased feeds on ranches with higher net incomes than on low income ranches. Furthermore, high income ranches provide more acres per animal than those in the low income group, demonstrating again that over-stocking combined with the use of large amounts of purchased feeds is not only disasterous for the range; but in the long run, equally harmful to the financial status of the operator.

This discussion of supplemental feeding will be limited to the problems of correcting nutritional deficiencies in range forage. Many of the early and some of the later estimates of the need for range supplements were too high. This was due largely to a failure to recognize the importance of some of the minor plant species and the selectivity of grazing animals in the choice of what was eaten. In some cases the estimates of animal requirements were also excessive.

We shall start the discussion with minerals, for here is where there is the greatest need in New Mexico and probably in West Texas as well. In numerous feeding experiments invariably increased production has occurred when a phosphorus supplement was used. The average increase for each cow bred has been 53 lb. due to improved calf crops and heavier average weaning weights. No other form of supplementation has returned as much for the amount invested.

Table 3. Effect of Mineral Supplements on Weight and Production of Range Cattle N. M. Bul. 359

Measure of Production		Cows Not Fed Minerals	Cows Fed Minerals	Gain from Mineral Feeding
Cows Calving	per cent	90.4	92.2	1.8
Calves Died	per cent	10.8	2.7	8.1
Cows Weaning Calves	per cent	80.7	89.7	9.0
Average Weight of Calves	pounds	408	442	34
Average Production per Cow[1]	pounds	336	389	53
Gain of Yearling Steers	pounds	321	353	32

[1]Average weight of calves multiplied by per cent of cows weaning calves.

Any lack of calcium which might occur will be more than adequately provided by the calcium phosphates used to correct phosphorus deficiencies.

Many experiments have been conducted to determine the results of feeding protein and energy to range cows. Significant research has been done by the U.S. Department of Agriculture demonstrating the importance of energy and the time of greatest need. This research established that the period after calving was most critical and that the need for additional energy often may be greater than for protein. The latter conclusion is borne out by an experiment at the New Mexico Experiment Station.

The New Mexico experiment was conducted over a period of 8 years in the severe drought of the 1950's. Hereford cows from 3 to 10 years old were fed in four groups on a predominantly black grama range. Group 1 was fed bone meal and salt alone. In group 2, ground milo was added to provide energy. In group 3, cottonseed pellets were used as a source of protein and in group 4, cottonseed meal and dehydrated alfalfa were combined to complete a supplement with minerals, energy, protein and carotene.

The results of this experiment established several significant points. The first was that either grain, cottonseed pellets, or cottonseed meal and dehydrated alfalfa when all years and all ages of cows were considered. Still considering all years, we find no significant differences in production where grain, cottonseed cake or meal and dehydrated alfalfa were used.

Table 4. Effect of Energy Level on Reproduction. USDA

Energy Level Before Calving	After Calving	Cows	Preg.
		No.	%
High	High	21	95
High	Low	22	77
Low	High	20	95
Low	Low	20	20

Table 5. Results from Supplements Fed Before and During Calving Season. N. M. Bul. 425

	Unit	Bone Meal Alone	Bone Meal Grain	Bone Meal Cotton-seed Cake	Bone Meal Cottonseed Cake Dehydrated Alfalfa
Cows	No.	24	24	24	24
Wt. before calving,	lbs.	949	934	930	925
Wt. after calving,	lbs.	887	889	906	916
Calves born	%	81	91	90	92
Calves weaned	%	76	83	80	85
Age of calves at weaning,	days	187	193	185	188
Wt. of calves at weaning,	lbs.	380	387	389	393
Production per cow[1],	lbs.	289	321	311	334

[1]Av. weight of calves X percentage calves weaned.

Table 6. Effect of Range Condition on Response to Supplemental Feeding. N. M. Bul. 425.

	Unit	Bone Meal Alone	Bone Meal Grain	Bone Meal Cotton-seed Cake	Bone Meal Cottonseed Cake Dehydrated Alfalfa
Wt. of calves years of av. rainfall	lbs.	428	424	430	436
Calves born in yrs. after av. rainfall	%	92.7	91.7	90.6	94.8
Wt. of calves drought yrs.	lbs.	351	366	366	367
Calves born after drought yrs.	%	77.5	87.4	84.1	83.9

It should be noted that in this experiment an adequate mineral supplement was fed to all groups. In a previous experiment when no mineral supplement was fed cottonseed cake, which is high in phosphorus content, was superior to grain as a supplement for range cows.

The small non-significant advantage from feeding dehydrated alfalfa shown in Table 5 is probably not a true measure of a need for vitamin A. This is indicated by the forage and blood analyses made throughout the experiments and supported by the fact that there was no increase in production in the five drought years. If ever, there should have been a need for additional carotene during this period.

Data in Table 6 shows that even when cows of all ages are included, no significant increase in production resulted when feeds were added to the basic minerals in years of near average rainfall (8.44 inches). It was only in the five drought years that there was a marked advantage from the use of these feeds. Even then milo appears to have been as effective as supplements providing carotene or additional protein.

Another aspect of the problem is shown in Table 7 where the young cows are separated from those which were fully mature. There was little, if any, increase in production from the mature cows on this semi-desert range after the basic need for phosphorus was satisfied. This was for a period of years when the average rainfall was 6.68 inches.

Table 7. Effect of Age of Cows on Results from Feeding Supplements. N. M. Bul. 425

	Unit	Bone Meal Alone	Bone Meal Grain	Bone Meal Cotton-seed Cake	Bone Meal Cottonseed Cake Dehydrated Alfalfa
Young Cows:					
Av. Wt. of First 3 Calves	lbs.	362	363	365	383
Av. of first 2 calf crops[1]	%	71.6	81.6	89.0	85.1
Cows over 5 years old:					
Av. wt. of calves	lbs.	389	394	399	396
Calves born	%	90.0	89.5	92.6	88.5

[1]Calves born when cows were 4 and 5 years old; the first 2 years after they were bred in the experiment.

With the younger cows there were significant differences, with the advantage being more in the number of calves weaned than in their average weight. Although the differences between group 2, receiving grain and groups 3 and 4 where a protein supplement was fed were not significant, the fact that production in both groups was somewhat greater indicates some advantage from using a feed higher in protein over grain alone. Other experiments have shown that heifers calving as 2 year-olds need more supplemental feed and a diet higher in protein than heifers which calve at 3 years old. This may also be true of cows suckling calves in winter.

This points out the importance of separating young from mature cows for feeding. They have different feed requirements and the young cows which need more will get less if they are fed together. If this is not done, it is best to regulate consumption by combining salt with the feed so that all animals will have an equal chance to eat.

Only breeds currently prevalent in this region were used in these experiments. Our research causes us to believe that cattle which are larger and more productive because of adaptation to our ranges do not require more supplemental feeding than smaller, less productive cattle. In fact, they may require less. This is not saying that they do not consume more forage, they do. This statement may not be true of some of the breeds now being introduced. It seems reasonable to suppose that large cattle with a faster growth rate and more mile production may have requirements which native range can not support without more supplementation than is required by the prevailing breeds.

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PRECONDITIONING RANGE CATTLE PRIOR TO PUTTING THEM INTO THE FEEDLOT

Pat Shepard

Owner, Shepard Feed Lots
Route 1
Hale Center, Texas 79041

DEFINITION

Preconditioning has become a very common term in the beef cattle industry, but it is vastly misused in its meaning. The term preconditioning has been used to cover a few small items of true preconditioning up to a total preconditioning program. Total preconditioning includes the following items:

1. Biological immunity
2. Internal and external parasite eradication
3. Weaning, dehorning, and castration
4. Adaptation to feed bunk rations and confinement watering facilities

Total preconditioning not only prepares the animal for the stresses of shipment, diet changes, changing environment and climate, but immunizes, teaches them to eat new rations, performs necessary operations to prepare animal for stocker and feeder cattle programs and eventually finishing.

NEED

The need for preconditioning range cattle prior to leaving their native home is obvious to all cattlemen. With the expense and investment involved in the cattle, interest costs, feed and veterinary expenses, overhead and machinery cost, and varying cattle prices, no room is available for death loss, excessive shrink, "poor doing" cattle, morbidity, and continuous health and performance problems during the stocker or finishing phase of cattle operations. All along the line of production from the calf to the beef carcass in the cooler, we need a healthy animal, capable of performing to his genetic potential, and more profit will be realized from the animal.

PRACTICES

The necessary practices for preconditioning range cattle will vary depending on the distances involved in transit, nature of drastic changes in climate, environment, and feeding conditions. The following is a list of preconditioning items which we like to know the animal has received:

1. Immunizations
   a. PI_3 (para-influenza-3) shipping fever complex
   b. Rednose- Lepto
   c. Blackleg-Malignant Edema
   d. Clostridium Novyi and Sordelli
   e. Pasteruella
   f. BVD (Bovine Virus Diarrhea)

2. Parasite Control
   a. Worming (drench, bolus, or in feed)
   b. Grubicide (pour-on, spray or dip)
   c. External parasites (lice, ticks, scabies)

3. Operations and Practices

   a. Weaning
   b. Dehorning
   c. Castration
   d. Feed bunk rations training
   e. Watering facilities training

4. Post-Range Treatments (To be done at feedlot)

   a. Pen branding or final animal identification
   b. Hormone implants
   c. Clostridium Type C & D (overeat vaccine)
   d. Dipping (if not done at ranch)

ECONOMICS

The economics of preconditioning is the delicate "scale" which will ultimately determine whether range cattle are preconditioned or not. The cost of preconditioning cannot always be recovered in the sale of preconditioned cattle until reputation and repeatablity are established. Part of this problem is brought out in the misuse I mentioned concerning the meaning of preconditioning. Some cattle sellers (producers or order buyers) have used the term to help sell their cattle when only a few of the necessary practices have been performed. Many feeders have paid $2/cwt above the market price for so-called preconditioned cattle and had everything happen to the cattle. For these and other reasons, it will probably continue to be difficult to recover all the costs of preconditioning until reputation and repeatability have been established or the practices standardized in the industry.

Also, one consequence which most producers fear about preconditioning is that it will become a required practice which will become the "norm" and the lack of which will be discounted in their market price. This consequence will not be to the producer's advantage.

For the producer who maintains ownership of his cattle through the finished animal, preconditioning is a profitable management practice in his operation. Obviously, here, there is no squabble over the value of the preconditioning since the producer will receive the full benefit. We are seeing this practice become more prevalent. Producers are feeding their own cattle in custom feedlots, averaging out on sale prices as the market changes by owning the cattle longer and putting on more of the weight gain themselves, and analyzing their overall breeding program as they see their cattle meet the changing demands of the meat industry.

A great deal of preconditioning is being done around the country although not all of it is at the producer level where the best results are seen. In many cases, the order buyer or concern putting the cattle together in the general producing area is doing some preconditioning. This treatment ranges from a few shots and operations prior to loading on a truck to the full treatment mentioned above while keeping the animal about 30 days before shipping to the feedlot. This is the next best approach since they get the animals into their collecting facilities generally within 24 hr after the animal has left his original home. This type program is serving a good purpose for cattle coming long distances such as from the Southeastern states.

It is difficult to place a cost per hundred weight on preconditioning. The cost of the immunizations and parasite control can be figured, but the lost gain and stress on a calf due to weaning, castration, and dehorning and the expense of feed bunk rations and labor are more costly to the producer, although conditions will vary this figure. The immunization and parasite control costs will be less than $2/head and the results can be extremely valuable. Preconditioning costs through order buyers vary from that based on cost of gain to more commonly basing it on cost of medicine, and yardage in which the ultimate owner owns the cattle during preconditioning, takes the death loss, and gets the gain during the 30 day period.

RESULTS

Preconditioned cattle recover more quickly after shipment, have less sickness and morbidity, and get on feed and off to peak performance more quickly. Many conditions dictate the results to expect from preconditioned cattle, but our experience shows from 1/2 to 1% less death loss on calves, less morbidity, slightly more daily gains and better feed efficiency.

In 1970 we purchased 4500 calves mostly in the southeastern states, had them preconditioned for 30 days, shipped them about 1200 miles to northeastern New Mexico for summer pasture, and returned them to the feedlot in October to finish. We had about 1/2% death loss while on preconditioning, 1/4% on summer pasture, and 1/4% while on finish. The general health, daily gains, and feed efficiency of the cattle were above normal. These animals gained an average of 1 lb per head per day while on preconditioning which helped offset some of the costs. We figured that preconditioning did not cost us anything in this case, but paid us, especially since the long distances were involved.

During this last month (September, 1971), we closed out a pen of feeder steers from South Texas which had been completely preconditioned by the owner prior to coming to the feedlot. The 122 head of steers finished with a 3.20 lb. average daily gain, 21.10 cents cost of gain, 7.22 air dry feed conversion, no death loss, $40.13/head profit. We had only $27.22 medicine costs for the entire pen of 122 steers. We normally don't believe we can have preconditioning done on feeder yearlings, but it is of value if a producer is to maintain ownership of his cattle in the feedlot.

PRECONDITIONING FACILITIES

Preconditioning can be done on native grass pastures, planted grazing crops, improved grass pastures, combination pasture and in semi-confinement facilities, or in total confinement. I feel that the pasture situation with the more open, clean surroundings are much better than total confinement. Pastures or semi-confinement facilities need to be where daily inspection and management of the cattle is easy. Temporary portable feed troughs, self feeders, or permanent fence-line bunks can be used to help bunk train cattle with conventional feedlot rations. Management of the practices used in preconditioning is the key, much more than the layout of any facilities.

SUMMARY

Preconditioning of range cattle prior to coming into the feedlot is an ideal practice to keep the cattle performing to their genetic potential and yielding maximum profits. Reputation and repeatability will be the only method of assuring recovery of preconditioning costs for the producer. Maintaining ownership of cattle through the finished animal will yield the producer the maximum benefits of preconditioning. Management is the key to preconditioning and not an expensive set of facilities.

RANCH MANAGEMENT CONFERENCE

The purpose of this conference is to bring together ranchmen, technicians, and others interested in ranch and range management in an effort to help solve some of the problems facing today's ranching industry. These meetings will provide for discussion of the latest information on brush control, grazing systems, stocking rates, ranch investment, income tax problems on ranches, forage inventories, wildlife management, range reseeding, poisonous plant problems and other points of concern on West Texas ranches.

An advisory committee to the conference is composed of ranchmen, bankers, range technicians and research specialists. Members of this Advisory Committee welcome your suggestions concerning the conference.

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