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A BRIEF REPORT OF THE 1951 SQUAW BUTTE-HARNEY  
EXPERIMENT STATION FIELD DAY

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The fourth annual Field Day of the Squaw Butte-Harney Range and Livestock Experiment Station was held on August 29, 1951. Many of the 125 ranchers and others present at the meeting requested that we prepare a brief summary of the research results discussed at the meeting, and mail the summary to those who attended. The following pages outline the discussion presented by Mr. Farris E. Hubbert, Jr., Station Animal Husbandman and Mr. Donald N. Hyder, Station Range Conservationist.

LIVESTOCK RESEARCH PROGRAM

by

Farris E. Hubbert, Animal Husbandman

The livestock research on the Squaw Butte-Harney Range and Livestock Experiment Station is conducted with cattle managed in a manner rather similar to most ranches depending upon sagebrush-bunchgrass range for their summer feed. Winter feeding is usually begun in early December and continues until late April, making an approximate 130-day winter feeding period. The cattle are then moved to the sagebrush range on the Squaw Butte unit of the Experiment Station. They are held on the sagebrush-bunchgrass range until late September. The cattle are then moved back to the valley where they clean up the meadows and graze on bunched hay until the early part of December.

The station maintains a breeding herd of approximately 180 cows, and in addition carries a group of approximately 120 yearlings.

The Influence of Winter Nutrition  
on Range Beef Cattle Production in Eastern Oregon.

The purpose of this study was to investigate the influence of 3 planes of winter nutrition on the production of Hereford beef cows depending upon sagebrush-bunchgrass type range for their entire summer feed, and upon native meadow hay for their main winter feed.

The study was initiated in December of 1946 when 21 breeding cows between the ages of 3 to 6 years were assigned to each of the 3 planes of winter nutrition. The Lot I group was to receive only enough meadow hay to maintain the animals in a healthy condition, but not enough to

prevent a loss in body weight of approximately 100 pounds. The Lot II group was fed all of the meadow hay that they would clean up in a 24-hour period. The Lot III group received 1 pound of barley and 1 pound of cottonseed meal per day in addition to all of the meadow hay that they would clean up in a 24-hour period. All lots received a phosphorus supplement.

The average amount of hay consumed by each of the lots during the 4 wintering periods was:

Lot I - 9 pounds of hay per day  
 Lot II - 17 pounds of hay per day  
 Lot III - 21 pounds of hay per day

The increase in meadow hay consumption shown by the Lot III animals over Lot II is due to the increased protein intake provided by the supplements fed. It is known that a diet low in protein will depress the appetite.

Table 1. Summary of average gain and loss in body weight of cows during winter and summer.

	<u>Lot I</u> (lbs.)	<u>Lot II</u> (lbs.)	<u>Lot III</u> (lbs.)
Winter	-84	-53	+43
Summer	+113	+80	+37

The average loss and gain of body weight per animal during the winter and summer periods is shown in Table 1. The great variation in weights shown by the Lot I animals and the small winter gain followed by the small summer gain made by the Lot III animals is believed to have a greater influence on the production of the cattle than the weights at the end of the experiment.

Table 2. Summary of average production per cow, conception rate, average daily gain of calves from birth to weaning, and average weaning weight of calves.

	<u>Lot I</u>		<u>Lot II</u>		<u>Lot III</u>	
Production per cow	183	(lbs.)	253	(lbs.)	289	(lbs.)
Conception rate	69	(%)	84	(%)	88	(%)
Average daily gain	1.03	(lbs.)	1.03	(lbs.)	1.11	(lbs.)
Weaning weight	304	(lbs.)	314	(lbs.)	340	(lbs.)

The production of calf weaning weight per cow in the breeding herd is shown in Table 2. The main influence resulting in the difference in production between Lots I and II was the difference of 15% in the percentage of calves dropped. The increased production of Lot III over Lot I was due to a higher percentage of calves dropped, a greater average daily gain from birth to weaning by the calves, and a heavier weaning weight. The difference of only 36 pounds in weaning weight production per cow between Lot II and III was due to a greater average daily gain from birth to weaning, a heavier weaning weight, and a difference of 4% in the percentage of calves dropped.

Table 3. Summary of dollar return per cow.

	<u>Lot I</u>	<u>Lot II</u>	<u>Lot III</u>
Gross return per cow @ .30¢	\$54.90	\$75.90	\$86.70
Hay @ \$15/T	8.78	16.58	20.48
Barley @ \$53/T	--	--	3.40
C.S.M. @ \$82/T	--	--	5.33
Return-feed cost	<u>46.12</u>	<u>59.32</u>	<u>57.49</u>
Increased value of culls	--	--	1.00
	<u>\$46.12</u>	<u>\$59.32</u>	<u>\$58.49</u>

The summary of the dollar return per cow by the different lots as shown in Table 3 indicates that it does not pay to limit the hay fed to breeding cows during the winter months. The study also shows that practically the same return on the dollar invested can be expected by supplementing with 1 pound of barley and 1 pound of cottonseed meal in addition to a full feed of meadow hay, as can be expected by a full feed of meadow hay alone. It is believed that a more efficient level of supplementing may exist between the full feed of meadow hay alone, and the full feed of meadow hay plus 1 pound of barley and 1 pound of cottonseed meal. A study has been initiated on the station to investigate this possibility.

(Progress Report)  
The Response of Brahman x Hereford Crossbred Cattle  
to Eastern Oregon Conditions.

At the 1948 convention of the Oregon Cattlemen's Association, a resolution was passed indicating a desire on the part of the cattlemen for some information on the response of Brahman x Hereford crossbred cattle to Eastern Oregon conditions.

Considerable experimental work has been done with Brahman crossbred cattle in the southern region of the United States. A summary of

8 different experiments where Brahman sires were used on cows of either Hereford, Shorthorn or Angus breeds, shows that an approximate 36 pound advantage at weaning time for the crossbred cattle could be expected over the straight bred cattle of the British breeds. In a study conducted in Montana where a Shorthorn sire was used on Hereford cows, it was found that the crossbred calves had an average advantage of 20 pounds at weaning time over the straight bred Hereford calves. In any cross breeding work, the best results always depend upon the use of a good bull.

If Brahman x Hereford crossbreds have any real advantage over other crossbred cattle in this area, it would be because of their ability to more efficiently utilize the low carrying capacity sagebrush range. If they have a place in this area they will also have to be able to withstand the winters. To answer these questions about the Brahman x Hereford cattle, a study is being conducted on this station in 3 phases:

- (1) A comparison of the wintering ability of Brahman x Hereford as weaners with Hereford weaners.
- (2) A comparison of gains made on the sagebrush range by the crossbreds and Herefords as yearlings.
- (3) A study of the grazing habits of the animals on the sagebrush range.

Four lots of 10 each of Brahman x Hereford steers, Brahman x Hereford heifers, Hereford steers and Hereford heifers were put on the wintering trial during December of 1950. Each animal was given an equal opportunity to gain approximately 1 pound in body weight per day during the winter feeding period. The ration fed included 7.5 pounds of meadow hay, 2.5 pounds of alfalfa hay, 1 pound barley and .5 pound of cottonseed meal. The amount of meadow hay fed per day was varied up to 8.5 pounds to make up for differences in weights of the animals. This ration was fed from December 9, 1950 until April 27, 1951.

Table 4. Summary of average daily gains made by Brahman x Hereford crossbreds and Herefords.

	<u>Brahman x Hereford</u> (lbs./day)	<u>Hereford</u> (lbs./day)
Dec. 9 - April 27	0.96	1.05
May 5 - June 1	2.48	2.68
June 1 - June 29	2.43	1.91
June 29 - July 27	1.30	0.96
July 27 - Aug. 24	0.48	0.34



Table 4 shows that the Hereford steers gained an average of 1.05 pounds per day during the winter period as compared to 0.96 pounds per day for the Brahman x Hereford crossbred steers. This difference in average daily gain resulted in a 13 pound advantage in body weight for the Hereford steers at the end of the winter period. On June 1, 1951 the Hereford steers had increased their advantage in body weight to 18 pounds per animal. The more rapid gains made by the crossbred steers during June, July and August had resulted in an 8 pound advantage in body weight for the crossbreds on August 24. During the period of May 5 to August 24 the crossbred steers gained an average of 26 pounds more per animal than the Hereford steers.

Incomplete data collected in the grazing habit study shows that the Hereford steers tend to cover a greater distance in their grazing activities than do the Brahman x Hereford crossbreds, but spend nearly one hour a day less time at grazing.

If possible, the Malheur Branch Experiment Station, Ontario, Oregon, will fatten the lot of Hereford steers and the lot of Brahman x Hereford steers. Data on the steers at slaughter will then be collected.

This study will continue for at least one year longer.

(Progress Report)  
Old Versus New Meadow Hay as  
Winter Feed for Beef Cattle.

It is a general practice in this area to carry a supply of hay over from one year to the next as a source of emergency feed in case of a short hay crop or a severe winter. The question has been asked whether it would be a better practice to begin feeding the old hay each winter and continue feeding it until all of the old hay is used up before switching to the hay produced during the previous summer. The other practice would be to begin feeding the hay produced during the previous summer and continue feeding the new hay until it was all used before beginning to feed the old hay.

The four most important factors to be considered in determining the best practice are palatability, the content of protein, total digestible nutrients, and carotene. Protein and total digestible nutrients are undoubtedly influenced more by harvesting methods and the stage of growth at which the hay is cut, than by the time the hay has been in the stack. Carotene is also influenced by harvesting methods but not to the extent of the other two factors. Palatability is influenced by the nutrient content of the hay, but I believe the carotene content of the hay after different lengths of time in the stack is the key to the answer of the question.

Carotene is the source of vitamin A for the animals. A deficiency of vitamin A does influence reproduction of beef cattle and can result in abortion, stillborn calves, blind calves at birth, calves that are weak and more susceptible to infectious diseases such as scours. A borderline deficiency of vitamin A can also reduce the fertility of both the sire and dam. As a general rule, it is said that cattle have the ability to store enough carotene and vitamin A while on green grass for 4 to 5 months to protect them for 6 to 7 months on dry feed. When we consider the fact that cattle depending upon sagebrush range for their summer feed are on green grass only 3 months out of the year, it seems possible that a low carotene intake during the winter months could result in lowered production by the beef cattle.

The two main objectives of this experiment are to determine:

- 1 - what level of carotene is necessary in our meadow hay to protect the breeding herd from vitamin A deficiency;
- 2 - how much carotene does our meadow hay contain when it is one, two and three years old.

We are using 18 pregnant cows in this experiment each winter. One-half of the animals receive old hay and the other half receive hay stacked during the previous summer. Both types of hay contained approximately 7% crude protein. The new hay contained approximately 40 p.p.m. carotene, and the old hay 20 p.p.m. The main factors being studied are the condition of the calves at birth, the rate of gain of calves from birth to 28 days of age, rate of gain of calves from birth to weaning, the blood carotene content of the animals during the wintering period, and the conception rate of the cows during the following breeding season.

Table 5. Summary of blood carotene values of cows.

<u>Date Bled</u>	<u>Old Hay Cows</u> (mcg/100 ml plasma)	<u>New Hay Cows</u> (mcg/100 ml plasma)
Jan. 1, 1951	105	164
March 14, 1951	89	145
April 26, 1951	68	98

Table 5 summarizes the blood carotene values of the two groups of cows during the past winter. The amount of carotene in the blood of the animals is an indication of the amount of vitamin A contained in the animal body and of the carotene intake of the animal. It has been found that when the blood carotene content gets down to 80 mcg of

carotene per 100 ml of blood, there is a possibility of vitamin A deficiency influencing the production of breeding cows. The 80 mcg level does not necessarily indicate a deficiency as it has been found that some cattle can produce thrifty calves and will conceive during the following breeding season when their blood carotene level is in the vicinity of 50 mcg. Other cows have produced weak calves when their blood carotene level was between 80 and 90 mcg. Table 5 shows that the animals on old hay approach the danger line but actually we found no symptoms in the calves that would indicate a vitamin A deficiency. The calving results next year will indicate whether or not the low carotene level had an influence on the fertility of the animals. This study will be continued for at least 2 years longer.

(Progress Report)

Protein Supplement for Sagebrush-Bunchgrass Range

Cattle depending upon sagebrush range for their only source of summer feed are on a very restricted diet after the bunchgrasses mature in July. The main forage producing grasses have been found to contain from 10 to 14 percent crude protein in early May. The protein content drops very rapidly after the plants mature during July. By late August the grasses contain from 3 to 5 percent crude protein.

Table 6. Summary of average daily gains made by cows and calves on sagebrush range.

	Cows (lbs./day)	Calves (lbs./day)
May 14 - June 8	2.0	1.6
June 8 - July 31	0.5	1.0
July 31 - Aug. 28	-0.8	1.0

Table 6 shows the gains made by the cows and calves from May 14 through August 28 of 1951.

Two groups of 45 head of breeding cows each are included in this study. One group has been fed a cottonseed meal-salt mixture since July 4. The cottonseed meal intake has been held at one pound per day. At the present time it appears that the animals will consume enough of the mixture to result in a pound per day intake of salt. This means a 50% salt-cottonseed mix was required to hold the intake at one pound of cottonseed meal per day.

As yet, no response to the supplement is apparent in terms of calf gains or condition of the cows.

The two groups of cows included in summer supplementing work will be incorporated in a winter nutrition study. The three winter rations to be fed are:

- 1 - Full feed of meadow hay alone.
- 2 - Full feed of meadow hay, 1/2 lb. barley and 1/2 lb. cottonseed meal.
- 3 - Full feed of meadow hay, 1 lb. barley and 1 lb. cottonseed meal.

#### RANGE RESEARCH AND MANAGEMENT PROGRAM

by

Donald N. Hyder, Range Conservationist

#### FIRST STOP AT 40-ACRE DEMONSTRATION PASTURE UNDER DEFERRED GRAZING

During the summer of 1950 the pasture was placed under deferred grazing, beginning the last of July or first of August, to permit the forage grasses to reach maturity and "cure out" before grazing begins. Prior to 1950 the pasture was used as a holding pasture during the latter part of September for the entire herd to give them a good fill before starting the drive from the summer range to the meadows near Burns. Because of past grazing use the pasture is in good condition. Yet much improvement can be made through sagebrush control. Station personnel intend to continue the practice of about 30 days of deferred grazing with a suitable number of cattle each year for a number of years, and to apply suitable sagebrush control as a demonstration of the performance of the native grasses in good vigorous condition.

During 1950 the pasture produced about 95 pounds of air dry herbage per acre. Seven head of Hereford yearlings weighing an average of 418 pounds were allowed to graze for 32 days beginning August 1. During 1951 the pasture produced about 280 pounds of air dry herbage per acre, which was cropped by 14 head of yearlings weighing an average of 613 pounds. Grazing started on July 29 and continued for 29 days. The increase in production during 1951 over 1950 was the response of vigorous grasses to an early spring favorable to good growth. Unfortunately the grasses on much of the 16,000 acres of Squaw Butte range land were not vigorous enough to respond that well. Consequently much potential beef has been lost. The value to be gained through maintaining vigorous forage plants cannot be over-emphasized.



Range management practices should be based upon the requirements of grass as a living thing. Some people seem to forget the sensitive quality of life when thinking about grass. Grasses can be strong and fat, or weak and hungry, or be killed completely.

We who are interested in the production of beef should never grow tired of hearing about and talking about HOW A GRASS LIVES AND GROWS. One of the most valuable native forage grasses in the sagebrush is bluebunch wheatgrass. (Excavated specimens were shown.) All operators in similar sagebrush country should be able to recognize this species, and would do well to base grazing management upon its growth cycle. SPRING GROWTH is made from the supply of food stored in the roots. Bluebunch wheatgrass continues to draw upon root reserves until the leaves are about 7 or 8 inches long. DURING THE REMAINDER of the growing season growth is made from newly manufactured food, unless an animal comes along with the idea that he needs those leaves more than the grass does. When the leaves are cropped off short the plant tries to make up for the loss by drawing heavily from root reserves again. If cropping continues severe and frequent, the plant may soon be exhausted to death. One should never forget that a grass does not consume its food--that it must manufacture its own food from the things it takes from the soil and air. The manufacturing process takes place in the leaves, so that the amount of leaf surface is a good indication of the size of the factory working for us.

Another important phase of the growth cycle comes AT THE CLOSE OF THE GROWING SEASON. As the plant begins to lose its green color it tries to replenish the supply of reserve food stored in the roots. That is done by moving carbohydrates from the leaves and stems to the roots. When the leaves have been cropped off short there's little to draw from and the plant will start growth the next spring weak and hungry.

Thus, from the grasses' point of view, deferred grazing as practiced on this 40-acre demonstration pasture is ideal. The size of the factory of green leaves is not reduced, and the entire growth for the season is still standing to provide a bountiful supply of food for storage.

In contrast with the grasses' point of view there is the grazing animals' point of view. Grass is more nutritious while green and growing rapidly. While grazing the demonstration pasture this year the yearlings made an average daily gain of 0.58 pounds. That resulted in a total gain of 5.65 pounds per acre. During the lush growing season a daily gain of 2.5 pounds is about average. Therefore, if half the grazing had taken place during the spring (one half is near the maximum which should be allowed), and the remainder during the late summer, we would have expected a gain of about 15 pounds per acre for the season.

Needless to say, grazing management should be based upon both "points of view" since the ultimate objective is a maximum production of beef year after year. A good standard to work toward in grass management includes the following points: (1) Delay opening date of grazing until bluebunch wheatgrass reaches a height of 7 or 8 inches. For large, vigorous plants that's about the middle of May in this area, but much later for the unhealthy plants. (2) Control the grazing load so that about 7 or 8 inches of the plants is still standing toward the middle of July to provide a good source of carbohydrates for storage in the roots.

Many problems are encountered in initiating a program of range management with such a standard in mind. The basic difficulty arises from the lack of flexibility in an operation. Beef production must continue. There's too little grass now, and we must use what there is. A straight reduction in numbers approach is an impractical, if not an impossible, means of initiating a good active program of range improvement. These difficulties were taken into consideration in planning the range research and management program at Squaw Butte. As we discuss our range research projects we will associate them with the difficulties encountered in making the all-important first step in initiating an active program in range improvement.

#### Increasing grass production through sagebrush control:

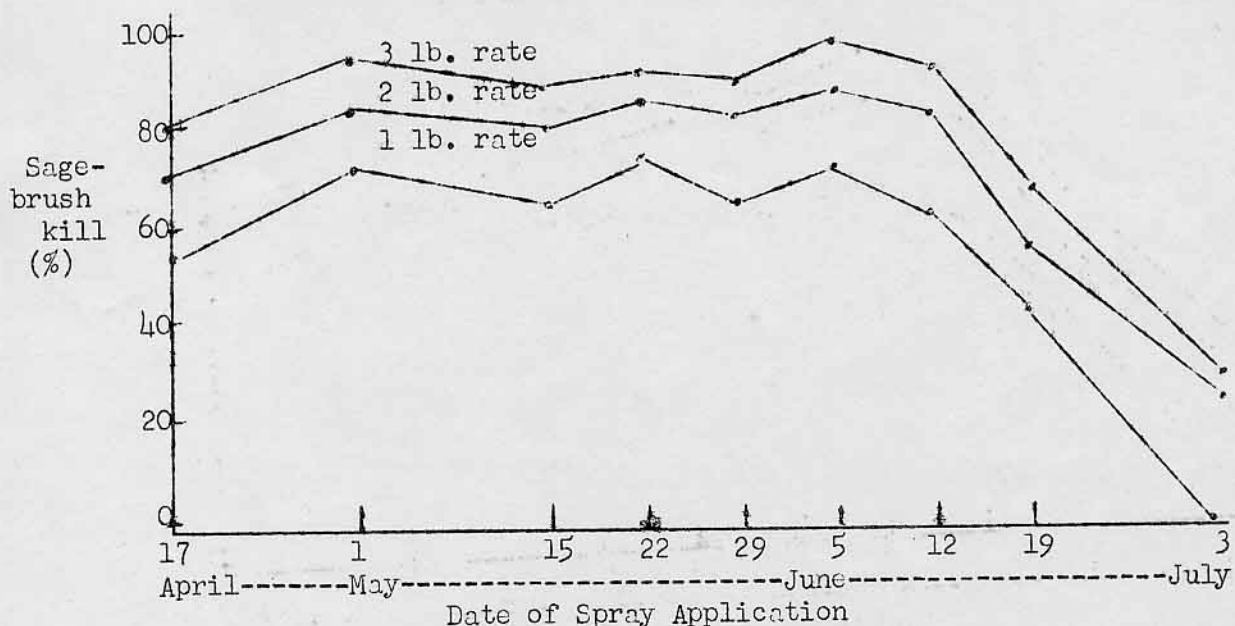
Since the basic difficulty is too little grass, and must use what there is, a sound approach is one of increasing the amount of grass enough to allow room for flexibility that will permit better range management. That sounds like circular reasoning but it can be done. One possibility is through sagebrush control. Removing sagebrush from areas that still support fair stands of the big bunchgrasses such as bluebunch wheatgrass, will make room for more grass. A number of tenth-acre plots have been established on the 40-acre demonstration pasture to study and compare the influence of sagebrush control by hand grubbing and by spraying with selective chemical herbicides upon grass production. Initial comparison data will be taken in 1952.

#### SECOND STOP AT ONE BLOCK OF SPRAY PLOTS--CHEMICAL CONTROL OF SAGEBRUSH:

We are all interested in what can be done with selective herbicides to control big sagebrush. Consequently a program of research was initiated in 1950 to determine the date when 2,4-D is most effective in killing big sagebrush, the required rate of application, and the formulation which is most effective. This block of 135 plots is a part of those included in the study last year. To date over 600 plots measuring 10 by 50 feet in size have been included in the study.

Observation of the plots indicates a great deal of variation in sagebrush kill, which depends primarily upon date of application. The following chart summarizes part of the results obtained from the spray applications made during 1950. The information gained will be published as soon as the remainder of the data can be compiled and analyzed. Meanwhile these partial results will tend to show what can be done with chemicals.

#### PARTIAL RESULTS OF 1950 SPRAYING



#### Summary statements of 1950 spray applications:

When to spray? Spraying during the month of May was most effective, but results indicate a possibility of poor reliability during the last week. A good rain about the first of June extended the effective period through the 12th of June. It appears that the last week or two of April will be more reliable than the first week in June. For spraying small test areas the middle of May is suggested.

How much to spray? A rate of one pound of 2,4-D acid equivalent resulted in effectiveness up to 89% of individual sagebrush plants completely killed with the crown of the remaining live ones showing only a few live branches. The average of plots sprayed at the one pound rate during May appears to be near 65%. For spraying small test areas a rate of  $1\frac{1}{2}$  to 2 pounds of 2,4-D acid equivalent is suggested.

What formulation should be used? So far we have included 25 different formulations of 2,4-D and 2,4,5-T in our study. The most outstanding thing to report so far is that the Sodium salt formulation of 2,4-D has resulted in very poor and inconsistent results. Amine or Ester formulations are much better. The chemical, 2,4,5-T, appears to be more effective than 2,4-D, but costs considerably more. The addition of an oil such as kerosene at a rate of 2 gallons per acre improved results on some plots, but apparently not enough to pay for the additional cost. For spraying small test areas amine or ester formulations mixed with water at a rate of 10 gallons per acre is suggested.

Where to spray? Select areas that support a dense stand of big sagebrush and a fair stand of perennial bunchgrasses. Keep in mind that the chemicals will also kill other brush plants such as bitter brush and weeds that contribute forage. Where an important amount of forage is contributed by such susceptible species the chemicals should probably not be used.

### THIRD STOP AT PLOTS USED TO EVALUATE VARIOUS METHODS OF PLANTING CRESTED WHEATGRASS, AND TO SEE A DEMONSTRATION OF THE OLSON ROTO-BEATER.

#### The place of crested wheatgrass in range management:

Planting adaptable species of grass serves as another, and in many cases the most promising means of increasing the amount of grass as an initial step in a range improvement program.

The big question is: Will it pay? Often we hear the statement that an operator can afford to plant it, but can't afford to fence it. The answer, of course, depends upon a number of things. First it depends upon the degree of planting success. We will come back to that in discussing planting methods. Perhaps the most important source of answer comes from the way a planted area is used in a program of range improvement. Each acre of crested wheatgrass may increase the amount of feed enough to permit good management practices of an additional 15 or 20 acres of sagebrush range. We intend to use crested wheatgrass for spring grazing to delay opening date on native species in the brush, and believe that the improvement in range condition will represent a far greater return on the planting investment than the increase in forage on the acres planted. In that way the cost of planting (and fencing where required) can be distributed over an area 15 to 20 times larger than the area planted.

Reseeding is a good tool to substitute for reductions in numbers of cattle in a range improvement program. Apparently some people still consider the resource of feed from native grasses in the sagebrush as being cheap and of little value. The very low cost per ton of feed taken from range lands should be recognized as one of the greatest opportunities that exists for increasing production through a sound program of range management.



### Methods of planting crested wheatgrass:

The difficulties involved in drilling or broadcasting seed on soil still rough from plowing were demonstrated. With drilling, the seed may be dropped on the surface or drilled as deep as 5 or 6 inches. With broadcasting, seed coverage is commonly left to the elements of weather. Both methods are poor. Rolling to firm the soil before drilling obviously improved depth of planting. Also rolling to cover broadcast seed with firm soil appeared to be good.

### Research program in planting methods:

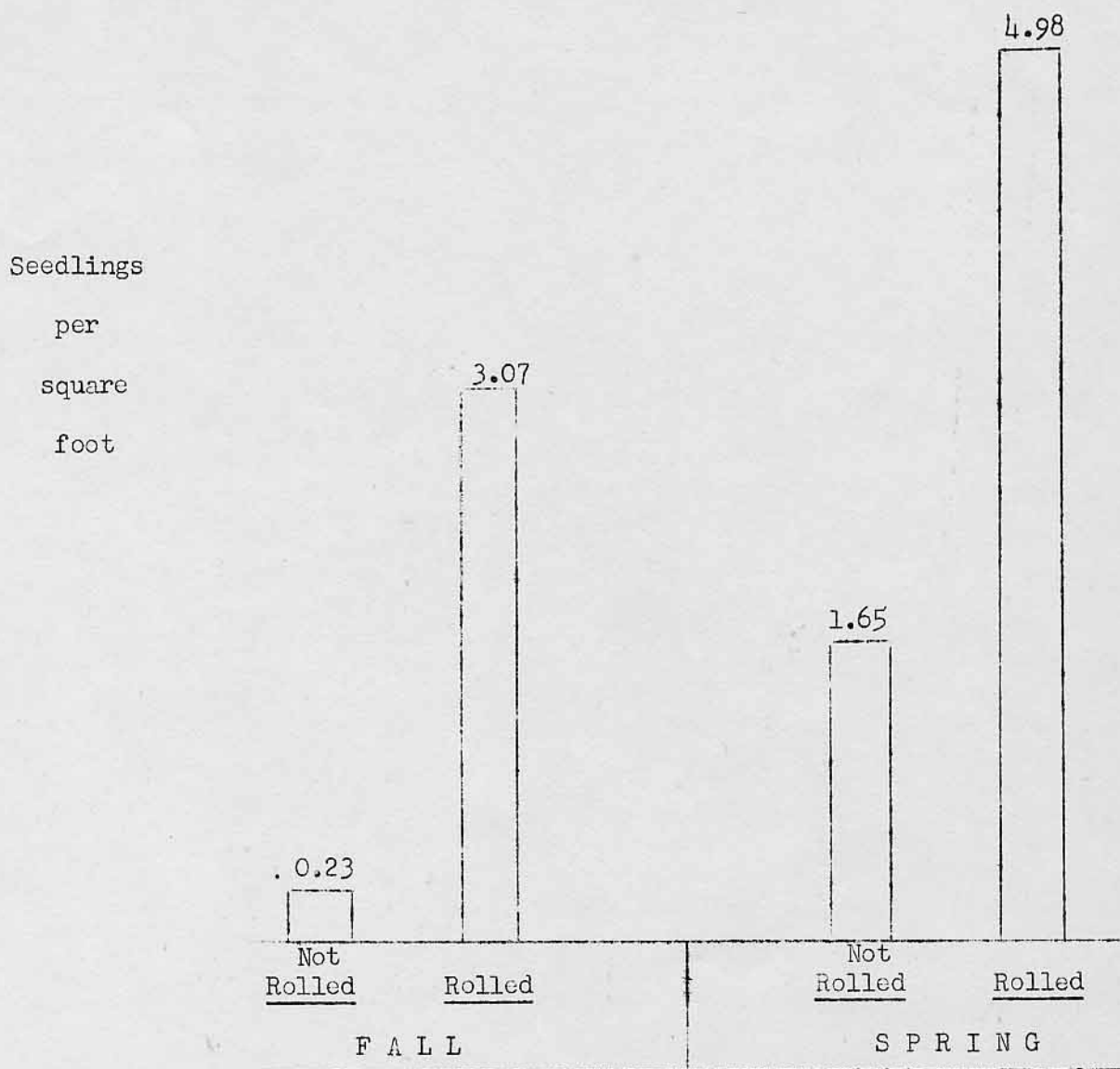
That methods of planting are important has been known for many years, and is easily demonstrated on these plots. In this study, which was primarily designed to test the use of a heavy roller to firm the soil upon the seed, the value of improving methods is emphasized. For many years a firm seedbed has been considered essential, but little has been done about it. The poorest method in this initial study of planting methods was an obvious failure which resulted from broadcasting late last fall on freshly plowed soil without further treatment. Perhaps some of you have seen that method used. Rolling to firm the soil upon the seed improved fall broadcasting by 1300%. The best method, which resulted in 21 times more seedlings than fall broadcasting, was spring broadcasting followed by rolling. All plots were planted at a rate of 3.3 pounds of viable seed per acre.

Half the plots were drilled and half were broadcast. Drilling was slightly better than broadcasting on the fall-planted plots, but broadcasting was about 3 times better than drilling on the spring-planted plots. That doesn't mean that broadcasting is better than drilling, because drilling was at a disadvantage with rolling only after drilling. Dr. L. A. Stoddart emphasized that disadvantage in a recent publication. (Grass plantings promise a new era on the range. Western Livestock Journal, page 12, Section 2, September 7, 1950.) He wrote: "Drilling is far superior to broadcasting on areas where the drill can be operated and where the soil is firm. Most drills on a too-loose soil will plant seed too deep. This is the cause of more range grass planting failures than any other factor excepting drought." Perhaps all of you have seen grass drilled in soil still loose and rough from plowing. His statement emphasizes the need for doing something about it. A need which was confirmed by our comparison of methods. Rolling was accomplished after drilling as well as broadcasting in our preliminary study. Although depth regulator bands were attached to the drill discs, depth of planting was not controlled. It appears that rolling should be done before drilling but after broadcasting if incorporated into planting methods. For

next year our research work will concentrate on improving both drilling and broadcasting methods by rolling, and will compare the two. So far we can report outstanding possibilities for improving planting methods, but will need several years of data before we can report upon the reliability of those improvements.

The following graph shows the results obtained by broadcasting.

ROLL TO COVER BROADCAST SEED WITH FIRM SOIL



Demonstration of Olson Roto-beater:

Rotating beater type implements offer encouragement in sagebrush control through mechanical means. Limited operation of the beater at Squaw Butte indicates that caution should be observed with respect to the present machine, however. It seems to be too light in both construction strength and total weight for a heavy stand of sagebrush, and small sagebrush plants are seldom killed. It is suggested that the beater not be operated where rocks are likely to be encountered. It is usually better to stop the equipment and throw rocks out of the way than to permit the beaters to strike them.

Our appreciation is extended to the Olson Manufacturing Company of Boise, Idaho for making the roto-beater available for testing and demonstration.

Rain prevented continuation of the program and caused only brief reference to some of the discussion above.

Two more stops were planned to complete the afternoon. The first at a 40-acre area which had been covered with the roto-beater to obtain performance and cost data. The last stop would have been on an area which is being planted to crested wheatgrass for spring grazing that will permit a more desirable opening date of grazing on the native species in the sagebrush. A very dense stand was obtained on about 100 acres which was plowed during the fall of 1950 then broadcast followed by rolling with a heavy roller during the spring of 1951. The roller was made from an 8-foot section of 24-inch corrugated culvert filled with concrete. The grass grew well and produced a good seed crop after planting last spring. We hope to complete the planting project this fall and next spring by adding another 500 or 600 acres.

We of the station staff were most happy to have you attend our 1951 Field Day. We sincerely hope you will be able to come back next year. If, as a result of reviewing the foregoing pages, you have additional questions or comments, please feel free to get in touch with us.

It is anticipated now that we will hold two separate field days in 1952. One will be on the meadow improvement program -- the other on range. At this date plans are not completed as to how the results of the livestock work being carried on the station will be presented. It will be included in one or the other of the two above-mentioned field days, or a special livestock day will be held on another date.

*W. A. Sawyer*  
W. A. Sawyer,  
Superintendent.