

DICKINSON EXPERIMENT STATION
DICKINSON, NORTH DAKOTA

ABSTRACTS OF RESEARCH
IN
AGRONOMY
1951

BY

THOMAS J. CONLON
ASSISTANT AGRONOMIST

ROTATION AND TILLAGE TRIALS

Forty-five years of study in Dry Land Soil Management at the Dickinson Experiment Station have been completed and the following facts established:

1. Highest grain yields are obtained after fallow, second highest on corn land. Where corn can be utilized as feed its value greatly exceeds the value of the additional small grain yield obtained on fallow over the yield from corn land.
2. No yield differences have been found between plowed and plowless fallow.
3. Fallow operations begun about May 15th and completed by June 1st give best results.
4. If clean, double disking corn land for grain is very satisfactory. If weedy, the land should be spring plowed.
5. Spring plowing has the advantage over fall plowing here.
6. The following practices are unsatisfactory:
 - a. Disking grain stubble to be seeded to small grain.
 - b. Green Manuring.
 - c. Continuous cropping of small grain or corn.
 - d. Growing corn on fallow.
7. Wheat on disked corn land, oats on spring plowed wheat stubble and corn on spring plowed oat stubble is a very successful combination here.
8. Long time rotations which include grass or legumes provide much needed hay and pasture and aid in soil improvement.

ROUGHAGE TRIAL

It is important for farmers and stockmen to know which crops will produce the largest volume of high quality feed. Therefore a trial designed to compare relative values of several roughage crops was begun here this year. Further trials are necessary for properly qualified conclusions.

SPRING WHEAT TRIALS

Presently, Mida, Pilot, Cadet, Rival and Thatcher are top yielding commercial varieties in this area. Numerous promising new strains are, however, included in the more than 300 candidates which make up the six major small scale trials with spring wheat at the Dickinson Experiment Station.

WINTER WHEAT TRIALS

1950 – 1951 Winter Wheat Trials at the Dickinson Experiment Station killed out 100%. Because of dry soil conditions at seeding time in many years and the severity of winter here, winter wheat has not been dependable.

OAT TRIALS

The early variety, Gopher, released by Minnesota in 1922, is still one of the highest yielders here and finds wide use in this area. Promising new strains are included among the 105 entries which make up the small scale oat trials at the Dickinson Experiment Station. Two in particular, C.I. 5636, (Andrew x Clinton) and C.I. 4267, (Anthony x Morota) will receive special attention in future trials.

BARLEY TRIALS

Trebi and Tregal, both older varieties, are still among the top yielders here. Promising named varieties include Vantage and Titan. Especially promising among the 60 entries which make up the small scale barley trials at the Dickinson Experiment Station is Dickinson selection 45-15 which has averaged 10.0 b.p.a. more than Trebi for the past five years.

FLAX TRIALS

B. 5128, one of the better yielding varieties in Dickinson trials is also one of the more popular varieties with farmers of this area. Small scale trials include few, if any, strains which offer more promise than B. 5128 for this area.

CORN TRIALS

Open pollinated Rainbow flint (Mandan strain) remains as one of the top varieties from the tonnage production standpoint in Dickinson trials. Experimental double cross No. 712, new to Dickinson trials in 1950, appears most promising however.

WINTER RYE TRIALS

Only mediocre yields, in comparison with other crops, were produced by winter rye. This crop is not entirely dependable in this area and is not of major economic importance to this area.

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**ABSTRACTS OF RESEARCH
IN
ANIMAL HUSBANDRY
1951**

BY

LARKIN H. LANGFORD
ASSISTANT ANIMAL HUSBANDMAN

ABSTRACT

Beef Cow Wintering

One year's work has been completed testing two different rations of hay and silage at two levels of feeding to beef breeding cows for a 6½ month winter period, followed by 5½ months on good range. A ration of 30 lb. corn silage and 10 lb. of either crested wheatgrass or prairie hay was adequate to maintain winter weights of 1100 lb. cows during the first winter. Cows calved in the winter lots and were given 7 lb. of grain per day until turned on range with their calves, May 14. Rations of 22.5 lb. corn silage and 7.5 lb. of either crested wheatgrass hay or prairie hay did not maintain winter weights of similar beef cows. The number, vigor, and birth weights of calves showed no significant differences between lots. Calves of mature dams averaged about 34 lb. heavier from the well wintered lots than from the less well wintered lots when weaned at 215 to 220 days of age. The work is being continued.

Beef Calf Wintering Followed by Summer Grazing

Two lots of 13 weanling calves were placed in dry lot November 1, 1950, and fed the following average daily ration for 196 days: Lot A - 25.54 lb. cereal or corn silage, 3.97 lb. crested wheatgrass hay, and 2 lb. oats; Lot B - 18.59 lb. cereal or corn silage and 4.13 lb. crested wheatgrass hay. Average daily gains were .796 lb. in Lot A and .343 lb. in Lot B. Both lots of calves which were of mixed sex were turned on good native grass range May 15, 1951, and weighed off range October 30, 1951. Average daily gain on range was .893 lb. in Lot A and 1.171 in Lot B. Total average gains for the year were 305.3 lb. in Lot A and 264.6 lb. in Lot B. The additional 40.7 lb. gain made by the well wintered calves was slightly more than offset by the greater feed cost.

A Swine Pasturing Experiment Using 6 Pasture Crops and Dry Lot

Seven lots of 10 average quality feeder pigs weighing about 32 lb. each were placed in 1 acre pastures and 1 dry lot on July 21, 1951. The pasture crops used were: Lot 1 spring rye, Lot 2 winter rye (spring seeded), Lot 3, rape and oats, Lot 4 winter wheat (spring seeded), Lot 5 alfalfa and Lot 6 Sudan grass. All lots were hand fed twice daily. A mixture of ground barley, oats, soybean meal and blood meal was fed initially but later simplified to only barley and soybean meal. The dry lot ration contained 10 lb. of protein concentrate in 110 lb. of feed, just twice the amount of concentrate in all pasture lot rations. Average daily gains for the 65 days the trials ran were: Lot 1 - .856, Lot 2 - .892, Lot 3 - .943, Lot 4 - .911, Lot 5 - 1.00, Lot 6 - .910, and dry lot .946. Feed consumed per 100 lb. gain was highest, 363.1, in Lot 1 and lowest, 314.7, in Lot 5. Feed cost per 100 lb. gain was highest, \$8.03, in dry lot and lowest, \$6.71, in Lot 5. Alfalfa was the most valuable pasture crop tried, followed by rape and oats, winter wheat, Sudan grass, winter rye, and spring rye in that order.

Comparison of 2 Types Sudan Grass for Prussic Acid Poisoning of Sheep

Two lots of 6 yearling wethers were pastured on two 2 acre lots of Sudan grass from Aug. 1, 1951, to Oct. 8, 1951. One lot of Sudan grass was standard sweet Sudan, and the other was a new strain developed for its low HCN content. No poisoning of any animal was observed in either lot during the pasture period.

A Demonstration Farm Poultry Flock

Five hundred day-old White Plymouth Rock chicks from the Poultry Department at N.D.A.C. in Fargo were started March 30, 1951, at the Dickinson Experiment Station. The chicks were fed and managed insofar as possible in a manner that we could recommend to other farm flock raisers of the West River Area. The cockerels were sold at 13 weeks of age averaging over 4 lb. in weight for about \$1.46 each. The pullets were ranged on alfalfa during the summer and housed September 4 in a suitable laying house. Egg production from the 230 pullets housed has been good in the fall months.

Larkin H. Langford_____

ASSISTANT ANIMAL HUSBANDMAN

The following pages were found in the back of the 1951 Annual Report.

B.J.O. 105: Economical Rations for Wintering Beef Cattle in Western North Dakota

Earle W. Klosterman, M.L. Buchanan, and D.W. Bolin, Animal Husb. Dept.

Larkin Langford and Ray Douglas, Dickinson Experiment Station

Objectives:

1. To determine the minimum amount of digestible nutrients necessary for wintering pregnant beef cows to maintain profitable calf production.
2. To compare the growth and later production of replacement calves wintered at two levels of feed intake.

Present Status of Project:

On November 1, 1950 the herd of bred cows and heifers at the Dickinson Experiment Station were divided into four lots and started on winter feed. Two lots of cows were fed the present National Research Council recommended amounts of feed. The other two lots were fed approximately three-fourths that amount. All lots were fed corn silage. One lot on each level of feeding received crested wheat hay and the other native prairie hay.

On May 14, 1951 the cows and their calves were removed from dry lot and placed on excellent summer range. All lots were grazed as one herd until October 30, 1951 at which time the calves were weaned. The body weights of the cows, average daily rations fed during the winter and the calves produced are presented in Table I.

Table I. Effect of Winter Ration in Gain of Cows, Birth Weight and Weaning Weight of Calves

| | Full Ration | | ¾ Ration | |
|----------------------------------|-------------|--------|----------|--------|
| Lot No. | I | II | III | IV |
| No. Cows per lot | 10 | 10 | 10 | 10 |
| Avg. Wt. Nov. 1, 50 lbs | 981.0 | 981.0 | 983.0 | 981.5 |
| Avg. Wt. May 14, 51 lbs | 995.5 | 958.5 | 865.0 | 884.0 |
| Avg. Wt. Oct. 30, 51 lbs | 1073.0 | 1026.5 | 1023.0 | 1056.0 |
| Avg. Daily Ration, lbs. * | | | | |
| (Nov. 1 – May 14, 1951) | | | | |
| Corn Silage | 30.04 | 30.13 | 22.53 | 22.55 |
| Crested Wheat Hay | 9.73 | | 7.38 | |
| Prairie Hay | | 9.95 | | 7.46 |
| Calf Production | | | | |
| Avg. Birth Wt., lbs. | 72.7 | 73.7 | 68.3 | 75.0 |
| Avg. Weaning Wt., lbs. | 456 | 436 | 419 | 463 |
| No. Calves Weaned | 6 | 8 | 7 | 4 |
| No. Cows not bred | 3 | 1 | 2 | 4 |
| No. Calves Died | 1 | 1 | 1 | 1 |

* Salt and bone meal self fed to all lots.

It is impossible to draw conclusions from one year's work with a limited number of animals per lot. It will be noted that the cows fed the limited ration lost considerable weight during the winter but that it was largely regained during the summer grazing period. The average body weights of the cows at the end of the grazing season were influenced by the number of dry cows in each lot.

There were some differences in birth weights and weaning weights of the calves. These differences, however, were not consistent with regard to level of feeding or type of hay fed. The weaning weights presented in Table I were corrected for the age of the calves. There was a difference noted in weaning weight of the calves depending upon the age of their dams. There was a difference between lots in this respect but the numbers are not sufficient to permit accurate correction at this time.

The 1950 calf crop was divided into two uniform lots in November 1, 1950. These lots were wintered on two levels of feed intake. The two groups were pastured together during the 1951 grazing season. The rations fed, the gains made on each and the summer gains are presented in Table II.

**Table II. Effect of Level of Winter Feeding Upon Gains of Weaning Calves
During Winter and Following Summer Grazing Season**

| Lot No. | I | II |
|--|----------|-----------|
| No. Calves per lot | 13 | 12 |
| Avg. Daily Ration, lbs.* (Nov. 1 – May 14, 1951) | | |
| Silage | 25.54 | 18.59 |
| Crested Wheat Hay | 3.97 | 4.13 |
| Oats | 2.0 | |
| Avg. Wt. Nov 1, 50 lbs. | 443.8 | 457.5 |
| Avg. Wt. May 14, 51 lbs. | 599.2 | 525.4 |
| Avg. Winter Gain, lbs. | 155.4 | 67.9 |
| Avg. Daily Winter Gain, lbs. | 0.79 | 0.35 |
| Avg. Wt. Oct. 30, 51 lbs. | 749.2 | 722.0 |
| Avg. Summer Gain, lbs. | 150.0 | 196.6 |
| Avg. Daily Summer Gain, lbs. | 0.89 | 1.16 |
| Avg. Total Gain, lbs. | 305.4 | 264.5 |

* Salt and bone meal self fed to both lots.

The winter gains made by these calves were not as high as had been planned. The reason being that a major part of the silage fed was a poor quality cereal silage which was not sufficiently palatable to maintain the scheduled feed intake. It will be noted from Table II that the lot fed the more limited winter ration made more rapid gains on subsequent summer pasture. The total gain for the year, however, was greater for the calves wintered on the higher feed intake. The final effect of level of wintering replacement calves upon ultimate size and production is yet to be determined.

Summary:

During the winter of 1950-51 one-half of the cow herd at the Dickinson Experiment Station was fed the present recommended amount of feed. The other half was wintered on three-fourths that amount. The results of one year's work with a limited number of cows does not permit drawing of conclusions at the present time. The cows on the low level of feeding lost approximately 100 pounds each during the winter. On excellent summer range, however, this weight was regained so that by the end of the summer there were no significant differences in weights of the cows. There were no consistent differences in regard to birth weight or weaning weight of the calves produced. Different results might be obtained during another year, especially if poorer range were available during the grazing season.

The effect of level of winter feeding replacement calves was also studied. Calves that gained an average of 0.35 pound daily during the winter gained 1.16 pounds during the grazing season. The average daily gains for a second group were 0.79 and 0.89, respectively. The effect of these systems of feeding upon mature size and life time production are yet to be determined.

Earle W. Klosterman