

Bibliography

- (1)—Underwood, E. J. and Filmer, J. F.
1935. Enzootic Marasmus. The determination of the biologically potent element (cobalt) in limonite. Australian Veterinary Journal, Vol. 11, pp. 84-92.
- (2)—Thompson, J. F. and Ellis, G. H.
1947. Is cobalt a dietary essential for the rabbit, Journal of Nutrition, Vol. 34, No.1.
- (3)—Evelth, D. F.
1946. Abortions in animals, North Dakota Extension Circular A-98.
- (4)—Roderick, L. M. and Harshfield, G. S.
1932. Pregnancy Disease of Sheep, North Dakota Agricultural Experiment Station, Bulletin No. 261.
- (5)—Patton, J. W.
1944. Acetonemia, a Vitamin A deficiency, Veterinary Medicine, Vol. 39, pp. 150-53.
- (6)—Henderson.
1948. Abstract in Jour. Am. Vet. Med. Ass'n., Vol. 112, pp. 393.

PASTURING OF MATURE CORN WITH COWS AND YOUNG STEERS

by

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The practice of turning grass-fat cattle, usually dry cows or yearlings, into a field of mature corn has been carried on in western North Dakota for a number of years. Under normal conditions cattle sold from these corn fields would find their way through market channels to feed lots in the Corn Belt where they would be finished into slaughter cattle. Operators usually expect at least \$1.00 per hundredweight margin in pasturing market cattle in a corn field, in addition to a substantial gain in weight.

Some Advantages in Pasturing Corn

From an agronomic viewpoint the pasturing of corn has several important considerations. According to tillage trials at the Dickinson Experiment Station over the last 40 years, grain crops following corn in a rotation produce about 85% as much as the same crops following summer fallow. Grain crops following corn yield about 10% more than on spring plowed stubble. Where the corn is pastured by cattle or sheep, fertilizer in the form of manure is well distributed over the field at the rate of approximately 0.65 tons per animal unit each month*. Each acre of corn will carry a mature cow for two times the number of days an acre yields in bushels of corn**. Therefore under most corn pasturing conditions in western North Dakota between one-half and one ton of manure per acre would be deposited on the land. In addition to the added fertilizer, corn pasturing results in stalks being left on the field to hold drifting snow during the winter. This will provide additional moisture for the following year's crop. The harvesting of corn by pasturing cattle greatly reduces labor and equipment costs for this operation.

*"Morrison's Feeds & Feeding", F. B. Morrison, 20th Edition.

**"Beef Cattle", Roscoe R. Snapp, 3rd Edition.

How Old

From questions raised by cattlemen there seems to be considerable doubt as to the most desirable age of cattle to use in the efficient pasturing of corn, also whether or not a protein supplement fed to cattle in a corn field will result in more economical weight gains and finally what the weight change would be in cattle during a 60 to 90 day feeding period in a corn field. With these questions in mind a study was undertaken at the Livestock Unit, Dickinson Experiment Station in 1947.

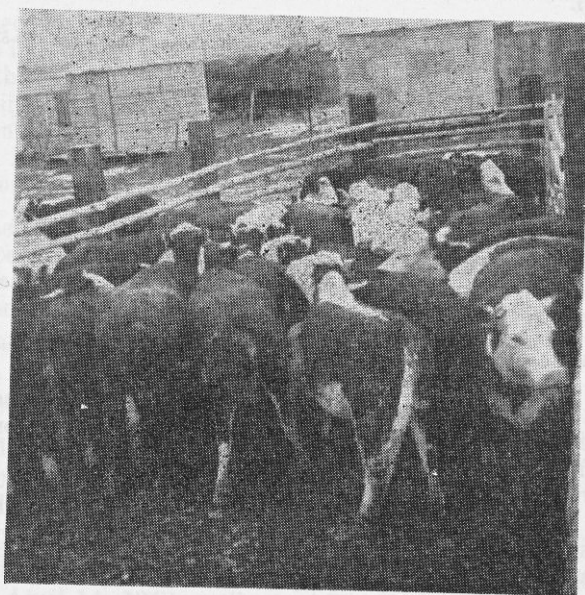


Figure 1—The cattle were individually number branded on the left hip. Odd numbers received one pound protein supplement daily.

A 34 acre field of mature Falconer corn was used as the source of corn and the yield of 25.6 bushels per acre was computed by picking ten 100 ft. rows throughout the field. This yield is comparable to that of most of the corn produced in the immediate area during 1947 but considerably above the 15 bushel an acre 40 year average. The variety of corn is important not only for its ability to yield, but also that the ears are well above the surface in case of early snows. Another consideration in selecting a variety for corn pasturing is that the ears are not too hard and flinty, for this results in considerable waste of grain when the ears are eaten. This wastage occurs by the kernels breaking from the cob and falling to the ground at the point where the ear is broken in two in the cow's mouth.

Two ages of cattle were used in the study, yearling steers and mature cows with calves weaned from them only a week before they were turned into the corn. Both lots of cattle were quite uniform as indicated by their initial weights and represented cattle that are commonly pastured in corn throughout this area before being marketed. To observe the

effect of a protein supplement on the cattle one-half the yearlings and one-half the cows were designated by random selection to receive one pound of soybean cake (44% protein) each day. The 28 head were individually number branded on the left hip and weighed individually at the beginning of the study, at seven day intervals, and at the conclusion of the study. Salt, bone meal and water were fed ad libitum. In addition to the 34 acres of corn, 200 acres of grain stubble and native hay land were grazed by the experimental cattle. A straw pile was the only shelter provided in case of severe weather.

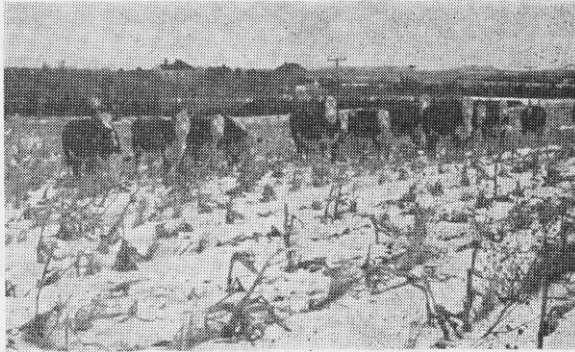


Figure 2—The variety of corn is important. The most desirable corn would be one which will carry early maturing ears well off the ground for at least 90 days. Much of this corn is broken down. Note that presence of the cornstalks helps hold snow on the field, thus conserving moisture for the next year's crop.

Considerable scouring developed especially in the yearling steers during the first week of the study. One steer that was severely affected later became stiff, apparently foundered. However, this individual completed the study and was marketed with the other 27 head. During the 70-day period covered in this study the 28 cattle were observed to spend about one-half of each day in the corn field and the remainder grazing in the stubble or lying down. All of the cattle were brought into the corral once each day, divided, and the designated cattle fed one pound of soybean cake each. Although a straw pile was available for shelter, the cattle made little use of the protection even when the weather turned cold and several inches of snow were on the ground. Only by mixing the protein supplement with whole oats for a short time could the cattle be induced to eat it. Two steers never did eat the cake readily.

Weather did not permit the study to continue longer than 70 days. The corn was estimated to be harvested as clean at the end of the study as if the same field had been harvested with a standard type mechanical corn picker.

Gains in Weight

The 14 cows averaged 2.18 pounds per day increase in weight while the yearling steers gained only 1.85 pounds daily. The seven cows receiving one pound of soybean cake daily averaged 2.41 pounds and the non-protein group 1.96 pounds. The steers receiving cake did not reflect this average daily gain over the non-supplemented lot. However, the

individual gains in the 14 yearlings varied considerably more than did the individual gains made by the 14 mature cows. A statistical analysis of the data did not reveal a significant difference in either lot between the feeding of one pound of protein supplement per head daily during

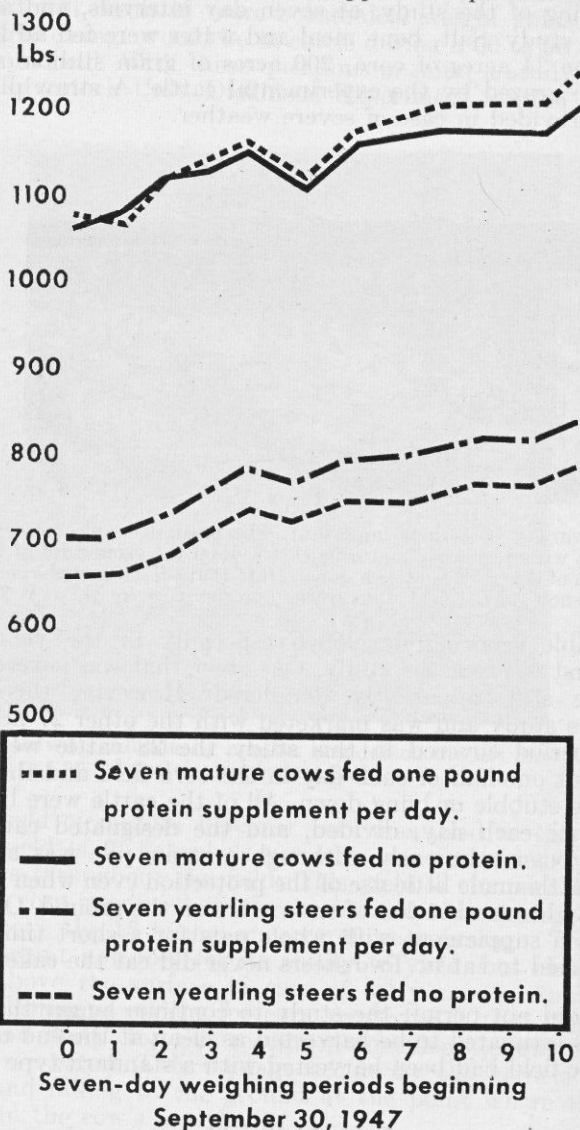


Figure 3—The four lines on the chart show the average weight of the respective groups of cattle as weighed at 7 day intervals in a trial pasturing off corn at the Livestock Unit of the Dickinson Station in 1947. Older cattle often put on more rapid gains than do calves under this system of short term feeding due to their larger frames. This is particularly noticeable when very thin but thrifty cattle are fed. The opportunity for rapid gains and to increase the grade of cattle is greatest with older cattle in thin condition.

a 70 day feeding period in a corn field. However, upon marketing the above cattle the cows receiving the protein supplement sold for \$19.00 per hundredweight while the non-protein cows brought \$17.30 a hundredweight. The protein supplemented steers brought \$25.00 per hundredweight, and the 7 steers not receiving the soybean cake \$22.90 per hundredweight. This higher selling price for the protein supplemented cattle resulted from the additional "bloom" shown by them. However, under varied market demands and conditions this "bloom" may not command premium prices. Although the selling price for different lots appears to be an important tool in measuring the difference between lots, the value of this criteria is not significant when the buyers' interests under different market conditions are considered.

Figure 3 reflects the increased body weights of all four lots throughout the 70-day feeding period. It is interesting to note the influence of weather on the different weighing days as it affected individual body weights. Extremes in weather either hot or cold appeared to result in less "fill" and lower weights for all cattle during the week. At the conclusion of the study weights were taken on all cattle before being trucked for West Fargo, a distance of 300 miles from Dickinson. A 5% shrink in body weights resulted between the loading weight and the selling weight.

The amount of corn and protein supplement consumed by the 28 cattle was computed and compared to the difference between the buying and selling price of the cattle after all trucking and other deductions had been made. Considering the deposited manure to have a value equal to the labor of the enterprise, the corn was marketed for \$1.75 per bushel in the field. This study carried out during a period of years should result in valuable data to be used by western Dakota farmers in planning their operations.

NORTH DAKOTA PLANTS RELATED TO THE LETTUCE GROUP

by

O. A. Stevens, Botanist

This is an easily recognizable group of plants of which dandelion, sow thistle and prickly lettuce are common examples. It is usually considered part of the large group of Compositae which includes sunflowers, asters, thistles and many other species, which have very small flowers grouped into heads. These heads are often thought of incorrectly as a single flower in sunflower and asters (see Sept. 1941 and Sept. 1943 issues of this bulletin). Central flowers of the head have tubular corollas but these are very small. In sunflowers the outer flowers have long, flat corollas, which are frequently referred to as "petals".

In the lettuce group, the corollas are all of the flat, elongated sort. The outer are longer than the inner ones, sometimes much longer. Another feature which is useful in recognizing the members of this group is the milky juice in all parts of the plant of most species. The flowers are most commonly yellow but in a few species they are blue, purplish, pink or lavender.