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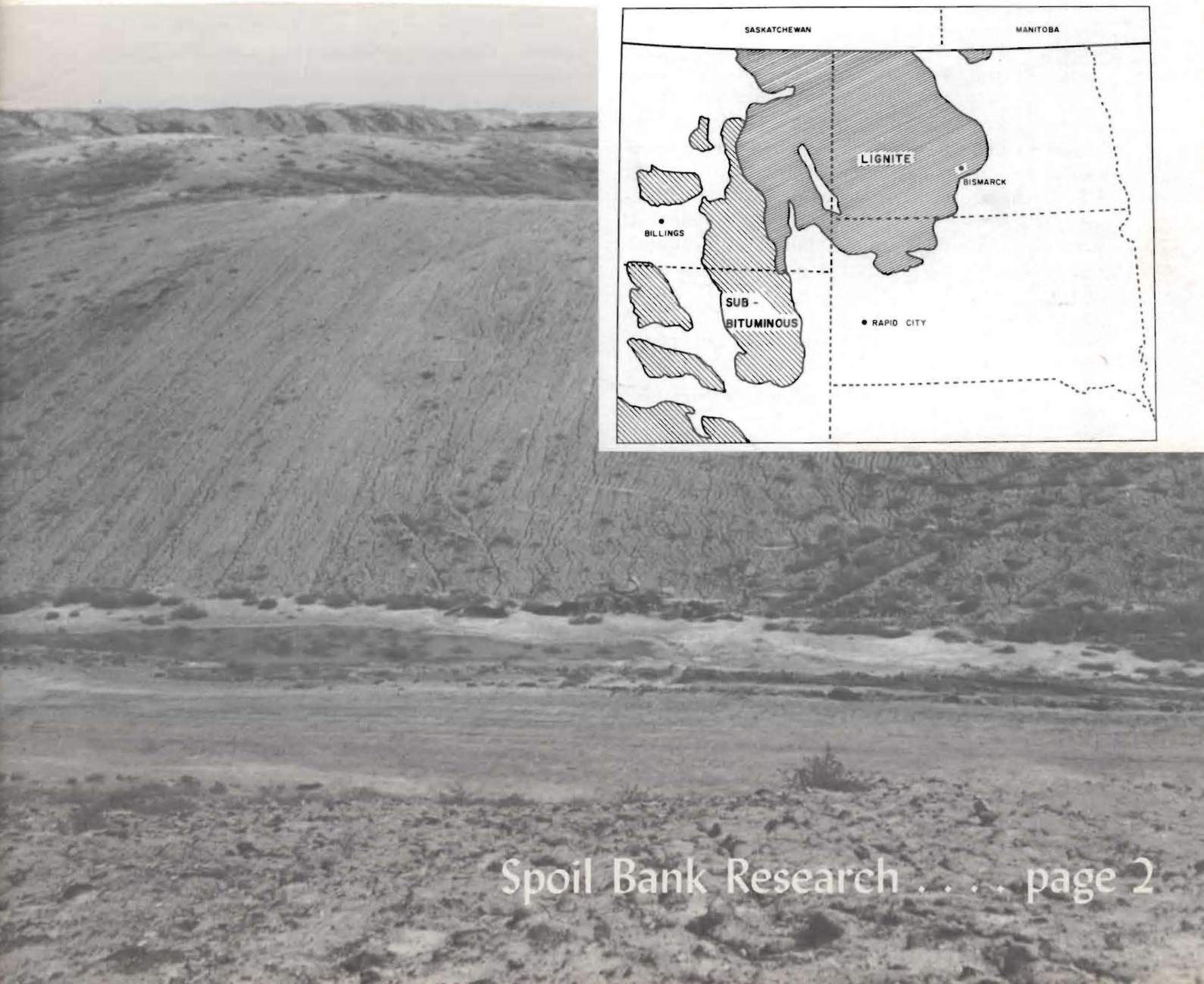

Spoil Bank Research . . . . page 2

From the Director

A. G. HAZEN

The North Dakota farmer benefits from a unique combination of state and federally supported agricultural research programs which have their basis of organization in the Morrill Act of 1862, the establishment that same year of the United States Department of Agriculture (USDA), and the Hatch Act of 1887. As has been discussed in this column before, the Morrill and Hatch Acts are the roots of the land-grant university system in the United States.

The Agricultural Research Service (ARS) of the USDA has been involved with production-oriented research problems in several ways. The Northern Great Plains Research Center at Mandan is one of the USDA-ARS stations most familiar to North Dakota farmers. This research station, and others like it, function to assist in solving specialized problems in agriculture. Another way the USDA-ARS works is to place researchers at the several state agricultural experiment stations. At present, 11 scientists are maintained with cooperative research programs in the North Dakota Agricultural Experiment Station facilities at NDSU. These are in addition to personnel in the USDA Metabolism and Radiation Research Laboratory which is also located on the campus. A third medium for accomplishing research, and one often overlooked, is through use of cooperative agreements between USDA-ARS and the state agricultural experiment stations. These cooperative agreements provide federal dollars to further support research by state-employed scientists.

One example of use for the cooperative agreement is the research begun by the Mandan ARS workers to study the problems of revegetating spoil bank areas after leveling (see cover picture). The North Dakota Agricultural Experiment Station will join efforts with ARS in July to continue the soils characterizations and grass species investigation on this project. Another example is assistance in the effort to "unravel" the mysteries of North Dakota's number one weed pest, the wild oat. A recent cooperative agreement with USDA-ARS will add funds to an already significant weed research effort at the North Dakota Agricultural Experiment Station. Cooperative agreements cover

(Continued on page 17)

In This Issue

On The Cover: A major research program related to natural resource utilization and conservation is exemplified by the problems of revegetating spoil bank areas in North Dakota after coal companies have leveled and smoothed over the excavated land.

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had 41 per cent more backfat (0.54 vs 0.38 inches). None of the steers graded well, primarily a reflection of a lack of marbling.

The two types of steers performed somewhat differently on the whole oats treatment (Table 2). The crossbreds gained only three to five per cent faster on the barley rations than on the whole oats, while the Herefords gained 18 per cent less rapidly on the whole oats and 11 per cent less on the rolled oats as compared to barley. The yearling Herefords did not appear to utilize the oats as efficiently as the crossbreds. This is shown by comparisons of the pounds of TDN used for gain only; that is, the pounds of TDN needed per pound of gain corrected for the TDN used for maintenance of the animal. The increase in TDN for gain only was 32 per cent for the whole oats over barley (Lot 5 over Lot 4), but only 13 per cent more for the rolled oats over the barley (Lot 6 over Lot 4). Making the same comparisons for the crossbreds shows the increase in pounds of TDN for gain only to be about three per cent for whole oats over barley and no increase for the rolled oats. Apparently, this was largely due to poorer chewing of the whole oats by the Herefords because some whole oats passed through unchewed and undigested.

On rations of this type with limited roughage, the steers appeared to be eating on an energy basis. Obviously, capacity of the digestive tract would not be limiting as it would on high roughage type rations. This is shown in Table 3, where the average feed intake was 20.6, 22.3 and 21.6 pounds of feed per day for the barley, whole oats and rolled oat rations respectively, but the pounds of TDN per day were 14.5, 14.7 and 14.5 respectively.

Summary

Barley, dry rolled, was more efficient than oats for finishing steers. In terms of feed required per pound of gain, the rolled barley treatments were 13 or 22 per cent more efficient than rolled or whole oats, respectively. In terms of rate of gain the steers on barley gained 8.5 per cent faster than those on rolled oats and about 12 per cent faster than those on whole oats. The barley-fed steers also showed more condition.

Crossbred steers (Holstein × Hereford) gained about 5.5 per cent faster on rolled barley rations than Herefords, 14 per cent faster on rolled oat rations and 25 per cent faster on whole oats than Hereford steers. This could be due to greater daily feed intake and the fact that the Herefords had more external fat.

Table 3. Summary by Main Treatments, Experiment C-32.

Treatment	Barley dry roll	Oats whole	Oats dry roll	Holstein × Hereford	Hereford
Lots	1 & 4	2 & 5	3 & 6	1,2,3	4,5,6
Initial wt. lb.	693	703	698	706	690
Final wt., lb.	1048	1018	1021	1057	1000
Avg. daily gain lb.	2.79	2.50	2.57	2.79	2.44
Feed per pound gain, lb.	7.4	9.0	8.4	7.9	8.7
TDN per lb. gain, lb.[1]	5.2	6.0	5.7	5.4	5.8
TDN for gain only, lb.	3.1	3.7	3.4	3.2	3.6
TDN per day, lb.	14.5	14.7	14.5	15.0	14.1
Feed per day, lb.	20.6	22.3	21.6	22.0	21.0
Grain, lb.	17.7	19.5	18.8	19.1	18.2
Supplement, lb.	2.9	2.8	2.8	2.9	2.8
Dressing %[2]	58.5	57.5	56.0	57.3	57.3
USDA grade[3]	8.5	8.0	8.0	8.3	8.0
Backfat, inches	0.50	0.43	0.44	0.38	0.54

[1,2,3]See footnotes for Table 2.

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3. Dinusson, W. E., D. O. Erickson, C. N. Haugse and M. L. Buchanan. 1969a. *Oats in Rations for Growing-Fattening Cattle.* N. Dak. Research Report Number 24.
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5. Dickinson Experiment Station. 1970. *Twenty-first Animal Livestock Research Roundup.* 1971. *Twenty-second Animal Livestock Research Roundup.*

FROM THE DIRECTOR

(Continued from page 2)

many commodities involving wheat, barley, potatoes, flax and sunflowers, and often include basic research necessary to meet the project objectives.

An administrative reorganization of ARS in July, 1972, was designed and implemented to develop a closer liaison with the state agricultural experiment stations. This reorganization is also intended to give greater attention to regional research needs and avoid duplication of effort which might exist between the federal and state research organizations. We welcome this opportunity to strengthen the bond between USDA-ARS and the state agricultural experiment stations.

fees, insurance on tenant housing, postage, machinery lease, etc.

2. Cash Income

Income from beets sold averaged $16.27 per ton, including government payments.

Income from custom work done for others in producing and harvesting beets is included in gross enterprise income.

Some farmers received and reported a hauling allowance from the factory for hauling beets beyond a base distance. This is listed as a small part of the gross income.

Cash costs and depreciation on machinery were deducted from gross income to obtain net enterprise income.

Return to Labor and Management

To obtain the returns to labor and management, a charge of $20 per acre was made against land, and a charge of 7 per cent was levied against investment in machinery and buildings. These charges and the cash costs and depreciation were deducted from gross enterprise income to obtain the residual figure, return to labor and management.

If desired, hourly wages can be assigned to operator and family labor and multiplied times the hours used on the sugar beet enterprise, and this labor cost then deducted from return to labor and management to obtain the return to management.

The total cost of producing beets of $142.90 per acre is $4.82 higher than the research results obtained in 1968.[1] The present study showed about $4 greater cash costs and about $3 lower fixed costs per acre than the 1968 study.

Machinery Investment and Costs

Machinery investment per beet acre was $114.55, based on current value. Some growers felt that it should be higher because of the need for big trucks which would not be necessary if beets were not grown. Investment was prorated for all machinery, including trucks, based on the percentage of total time that the machines were used for beets. In the case of planting and harvesting equipment it was not necessary to prorate since these machines were specialized beet equipment.

Total cost of operating machinery was $27.58 per beet acre for the three years. Depreciation is the largest cost item, followed by fuel and oil, repairs and net custom cost. The net custom cost was obtained by subtracting income from custom work from payments for custom work. A positive figure indicates more custom work hired than was done for others. A negative figure means more custom work was done off the farm than was hired done on the farm.

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[1]*Donald Hofstrand and Dale O. Anderson. 1970. "Sugarbeet Production Costs and Practices in the Red River Valley", North Dakota Farm Research, 27:6.*