



IRRIGATION IN THE SOURIS BASIN

Ben Hoag

Irrigation of numerous crops has been evaluated at a research site near Karlsruhe, North Dakota. Production at the site has increased over a four-year period due mainly to better water and production management.

Irrigation of numerous crops has been conducted and evaluated near Karlsruhe for the past four years with increasing success. The research site located 1 mile north and 1.25 miles east of Karlsruhe, North Dakota, is carried out by the staff from the North Central Experiment Station at Minot in cooperation with the Garrison Diversion Conservancy District, The Karlsruhe Irrigation District, the Bureau of Reclamation, North Dakota State University, and Lawrence Black (farmer).

The site has a Renshaw sandy loam with low fertility. A soil test was conducted and the site was fertilized for certain yield goals. These will be listed in parentheses by each of the crops in the following tables. Generally, all

sites received a combination of nitrogen, phosphorus, and potassium.

Listed on Table 1 are the average yields in 1977 compared to a dryland site adjacent to the irrigated area. Note the yield goal for each crop was not achieved.

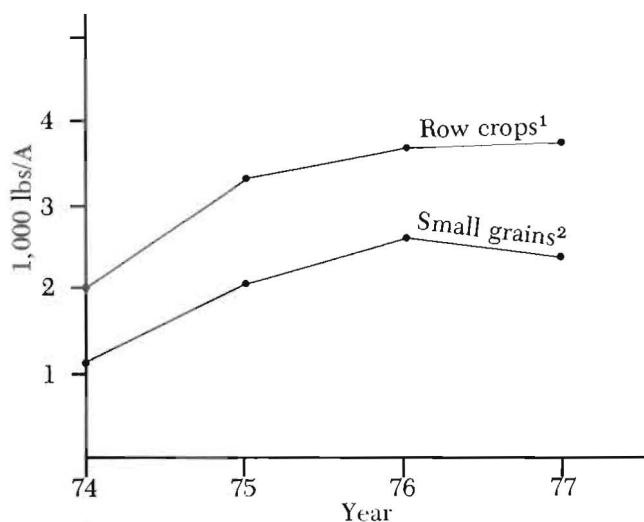
The dryland comparison was used for the first time in 1977. However, irrigation of crops has continued since 1974 with increasing success indicating the value of management in the irrigation of crops. Small grain and row crop yields are compared for each of the four years. Generally, yields have increased with the exception of small grain yields in 1977 (Figure 1). Forage yields of corn, sorghum and oats are compared in Figure 2 with a steady increase in production. This increase has also occurred with sugar beets. Potato production has decreased. This was caused by the effect of wider row spacing and disease problems especially in 1977.

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TABLE 1 — Yield of Crops Grown Under Dryland and Irrigated Conditions — Karlsruhe — 1977

<u>Small Grain Crops</u>	<u>Dryland Avg. Yield</u>	<u>Irrigated Avg. Yield</u>
HRS wheat	9.3 bus/A (25)	43.4 (70)
Durum	10.5 bus/A (25)	54.5 (70)
Barley		62.1 (90)
Oats	20.6 bus/A (40)	98.6 (120)
Flax	12.1 bus/A (20)	23.8 (50)
Safflower	814 lbs/A (1250)	998 lbs/A (2750)
Row and Forage Crops		
Corn grain		127.4 bus/A (140)
Corn silage (70% H ₂ O)		21.4 tons/A (23)
Alfalfa hay (15% H ₂ O)		5.5 tons/A
Double crop (oats and sorghum) (70% H ₂ O)		15.9 tons/A
Forage sorghum		23.6 tons/A
Field beans		3000 lbs/A (3250)
Soybeans		26.2 bus/A (60)
Potatoes		192 cwt/A (500)
Sugar beets		25.7 tons/A (22)
() Yield goal		

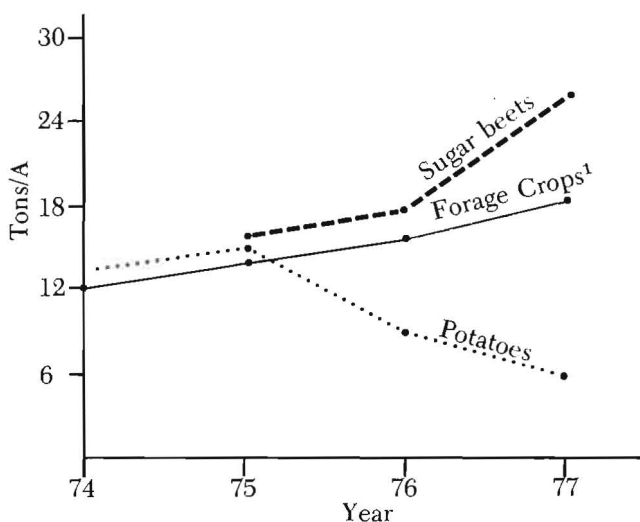
Figure 1 — Average Production Per Year for Irrigated Small Grains and Row Crops — Karlsruhe, N.D. — 1974-77.



¹ Grain corn, field beans, and soybeans

² HRS wheat, durum, barley, and flax

Figure 2 — Average Production Per Year of Irrigated Sugar Beets, Potatoes, and Forage Crops — Karlsruhe, N.D. — 1974-77



¹ Corn silage, sorghum silage, and oats silage

Numbers for Figures 1 and 2 (not a part of the paper)

Figure 1	<u>Pounds Per Acre</u>			
	74	75	76	77
Small grains	1137	2271	2850	2603
Row crops	2032	3432	3812	3902
Figure 2	<u>Tons per Acre</u>			
	12.2	14.0	16.4	19.0
	13.3	15.0	10.7	8.6

Summary:

Irrigation has increased yields of small grains dramatically in 1977 over production under dryland conditions. It has also made available a wide range of crops with the potential of a good monetary return. Generally, production has increased over the four years due mainly to better water and production management practices.