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Cornhusker Economics

Cooperative Extension

Institute of Agriculture & Natural Resources
Department of Agricultural Economics
University of Nebraska – Lincoln

Inventorying Nebraska's Irrigation Acres

Market Report	Yr Ago	4 Wks Ago	6/15/01
Livestock and Products, Average Prices for Week Ending			
Slaughter Steers, Ch. 204, 1100-1300 lb Omaha, cwt	$70.14	$74.50	$ *
Feeder Steers, Med. Frame, 600-650 lb Dodge City, KS, cwt	89.00	94.38	95.25
Feeder Steers, Med. Frame 600-650 lb, Nebraska Auction Wght. Avg	98.23	106.60	103.93
Carcass Price, Ch. 1-3, 550-700 lb Cent. US, Equiv. Index Value, cwt	114.42	118.45	117.94
Hogs, US 1-2, 220-230 lb Sioux Falls, SD, cwt	50.00	53.00	53.50
Feeder Pigs, US 1-2, 40-45 lb Sioux Falls, SD, hd	*	54.00	45.52
Vacuum Packed Pork Loins, Wholesale, 13-19 lb, 1/4" Trim, Cent. US, cwt	134.50	136.80	138.40
Slaughter Lambs, Ch. & Pr., 115-125 lb Sioux Falls, SD, cwt	*	85.25	72.62
Carcass Lambs, Ch. & Pr., 1-4, 55-65 lb FOB Midwest, cwt	210.00	171.00	171.00
Crops, Cash Truck Prices for Date Shown			
Wheat, No. 1, H.W. Omaha, bu	2.96	3.20	3.11
Corn, No. 2, Yellow Omaha, bu	1.84	1.69	1.67
Soybeans, No. 1, Yellow Omaha, bu	4.83	4.30	4.38
Grain Sorghum, No. 2, Yellow Kansas City, cwt	3.13	3.29	3.23
Oats, No. 2, Heavy Sioux City, IA , bu	1.17	1.50	1.46
Hay, First Day of Week Pile Prices			
Alfalfa, Sm. Square, RFV 150 or better Platte Valley, ton	103.00	115.00	102.50
Alfalfa, Lg. Round, Good Northeast Nebraska, ton	70.00	82.50	92.50
Prairie, Sm. Square, Good Northeast Nebraska, ton	70.00	105.00	105.00

* No market.

With much of the state lying over the Ogallala Aquifer, Nebraska has a valuable irrigation endowment. According to USDA's 1997 National Resources Inventory, Nebraska has more than 7 million acres of irrigated cultivated cropland. Only one other state, Texas, has more cultivated cropland; and that state has been experiencing a steady decline in irrigated acres over the past quarter century.

While the economic significance of these irrigation assets to the state's economy seems obvious, it is somewhat surprising to find no clear consensus as to how many acres are really under irrigation. Nor has there been any definitive information on the acreage distribution by type of irrigation system.

The 1997 Census of Agriculture, a source used extensively for benchmark analysis of the agricultural production sector down to the county level, indicates Nebraska has a total of 6.94 million acres of irrigated land; while Nebraska Agricultural Statistics Service estimates a total of 8.1 million acres that have wells or ditch water available and could be irrigated if conditions warrant. Finally, the USDA's 1997 National Resource Inventory, which classifies the acreage base across all states, placed Nebraska's cultivated cropland at 7.42 million acres with an additional 352,000 acres of non-cultivated irrigated cropland (such as irrigated forage production).

So which data base is the most accurate one? Just what is a reliable estimate of Nebraska's irrigated acreage? Moreover, how is this acreage distributed geographically across Nebraska counties and how is the acreage distributed across the various types of irrigation being use? With these questions in mind, we have attempted to construct a realistic inventory of irrigated acres in Nebraska by type of system.

Our method involved starting with Nebraska Department of Revenue's county-level totals of privately-owned irrigation acreage on the property tax roles for the 1999-2000 assessment year. Since this series is the data base used for the assignment of assessed value, and hence, property taxes, we believe it represents an accurate acreage amount. To this was added estimates of publically-owned irrigation acreage not on the tax roles which were obtained from the Nebraska Board of Educational Lands and Funds and the University of Nebraska-Lincoln. When combined, the state's irrigated acreage totals nearly 7.4 million acres distributed across the eight agricultural districts as noted in Table 1 (county-level acreage statistics are published in the **2000-2001 Nebraska Farm Real Estate Market Developments** report). This irrigated acreage amount represents one third of the state's cropland acreage.

Once we had arrived at what we believe to be a reliable benchmark estimate of total irrigated cropland, the next task was to identify the distribution of that acreage by type of system used. More specifically, we wanted to estimate the extent of center pivot technology being used and the acreage that it represented. This technology, which was invented here in Nebraska and developed over the past half century, has literally transformed irrigation agriculture in the state as well as the world over. Not only has it opened up lands which would otherwise not be irrigable, but it has also greatly enhanced water use and other input efficiencies on land that was previously gravity irrigated. As a result, thousands of Nebraska's irrigated acres are being converted each year to center pivot systems.

Unfortunately, detailed acreage statistics on center pivot systems and associated acres are not available. Hence, we relied upon the UNL's Conservation and Survey Division's satellite imagery of the state which reveals the center pivot circles in graphic detail. Using the satellite map for 1997, the latest one available, we were able to develop county-level center pivot acreage estimates. These were then reconciled against our previously-developed irrigated acreage totals, and the final center pivot acreage estimates made.

As can be seen in Table 1, center pivot irrigation is the primary system being used in Nebraska, accounting for more than 4.6 million acres and approaching two-thirds of our irrigated land base. Twenty-five years ago, that amount was only one-third. If conversion of gravity irrigated land to center pivot continues at the rate of recent years, as well as some dryland cropland being developed with center pivot technology, as much as 70 percent of Nebraska's irrigated acreage could be under center pivot systems by 2010.

The implications of the above are for much more than state's bragging rights. Our irrigated land base represents a most vital resource that will increasingly become the envy of a water-deficit world. Moreover, the fact that the bulk of that acreage is using a form of technology that is water efficient and complementary to precision agriculture, we can be more assured of its sustainability into the future.

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Table 1. Nebraska's Irrigated Cropland Acreage by Statistical District, 2000

Ag Statistics District	Total Cropland	Total Irrigated Cropland	Irrigated Cropland as a Percent of Total Cropland	Center Pivot Irrigated	Other Irrigated	Center Pivot as Percent of Total Percent
	---------- 1,000 acres ----------		Percent	---------- 1,000 acres ----------		Percent
Northwest	3,013	709	23.5	422	287	59.5
North	2,033	537	26.4	520	17	96.8
Northeast	3,390	877	25.9	776	101	88.5
Central	2,144	1,210	56.4	535	675	44.2
East	4,034	1,463	36.3	784	679	53.6
Southwest	2,568	924	36.0	738	186	79.9
South	1,857	897	48.3	399	498	44.5
Southeast	3,054	766	25.1	433	333	56.5
State*	22,093	7,382	33.4	4,608	2,774	62.4

* May not add to totals due to rounding.