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Inventorying Nebraska’s Irrigation Acres

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Inventorying Nebraska’s Irrigation Acres

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>
<thead>
<tr>
<th>Ag Statistics District</th>
<th>Total Cropland</th>
<th>Total Irrigated Cropland</th>
<th>Irrigated Cropland as a Percent of Total Cropland</th>
<th>Center Pivot Irrigated</th>
<th>Other Irrigated</th>
<th>Center Pivot as Percent of Total Percent</th>
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<td></td>
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<td>Percent</td>
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* May not add to totals due to rounding.