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# A Center Pivot Premium: What Does the Market Suggest?

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| Market Report | Yr Ago | 4 Wks Ago | 5/31/13 |
|---|---|---|---|
| ***Livestock and Products, Weekly Average*** | | | |
| Nebraska Slaughter Steers, 35-65% Choice, Live Weight | $121.06 | $129.14 | $125.75 |
| Nebraska Feeder Steers, Med. & Large Frame, 550-600 lb. | 177.41 | 159.33 | 147.33 |
| Nebraska Feeder Steers, Med. & Large Frame 750-800 lb. | 157.77 | 138.62 | 138.07 |
| Choice Boxed Beef, 600-750 lb. Carcass | 196.83 | 198.59 | 208.32 |
| Western Corn Belt Base Hog Price Carcass, Negotiated | 85.97 | 87.15 | 93.04 |
| Pork Carcass Cutout, 185 lb. Carcass, 51-52% Lean | 80.38 | 86.67 | 93.89 |
| Slaughter Lambs, Ch. & Pr., Heavy, Wooled, South Dakota, Direct | 148.50 | 113.00 | 110.00 |
| National Carcass Lamb Cutout, FOB | 346.50 | 285.19 | 280.08 |
| ***Crops, Daily Spot Prices*** | | | |
| Wheat, No. 1, H.W. Imperial, bu. | 5.65 | 7.31 | 7.07 |
| Corn, No. 2, Yellow Nebraska City, bu. | 5.81 | 6.98 | 7.07 |
| Soybeans, No. 1, Yellow Nebraska City, bu. | 13.18 | 14.57 | 14.95 |
| Grain Sorghum, No. 2, Yellow Dorchester, cwt. | 9.21 | 11.80 | 12.32 |
| Oats, No. 2, Heavy Minneapolis, MN , bu. | 3.07 | 4.18 | 3.99 |
| ***Feed*** | | | |
| Alfalfa, Large Square Bales, Good to Premium, RFV 160-185 Northeast Nebraska, ton. | 207.50 | * | * |
| Alfalfa, Large Rounds, Good Platte Valley, ton. | 140.00 | 227.50 | 225.00 |
| Grass Hay, Large Rounds, Good Nebraska, ton. | 97.50 | 222.50 | 217.50 |
| Dried Distillers Grains, 10% Moisture, Nebraska Average. | 212.50 | 233.00 | 220.00 |
| Wet Distillers Grains, 65-70% Moisture, Nebraska Average. | 73.50 | 90.00 | 91.00 |

*No Market

In the past decade, Nebraska overtook California as the state with the highest number of irrigated acres in the country.[1] Nebraska has more than 8.5 million acres of irrigated land, relying primarily on the groundwater from the Ogallala Aquifer for its irrigation. The primary method of irrigation in the state is with center pivot systems — a technology which was invented and developed in Nebraska, with all the major center pivot manufacturing companies headquartered there. As of 2007, nearly 80 percent of the irrigated land in Nebraska used center pivot systems; and this percentage continues to grow as gravity irrigated land (which can be converted) is changed over to this technology.

***Efficiency*** is the reason behind the predominance of this center pivot technology, and that comes in several different components.

- ***Labor Efficiency:*** According to the 2013 University of Nebraska-Lincoln Nebraska Crop Budget series, the labor associated with running gravity irrigation on corn will average one and three-fourth hours per acre; while labor associated with irrigating the same crop using a center pivot system will be less than one-third hour per acre.[2] At a labor charge of $20 per hour, that converts to a production cost savings approaching $30 per acre.
- ***Water Efficiency:*** With the newer center pivot technology (drop nozzles with precision application monitoring, etc.), producers can get more than 90 percent of the water pumped to the crop's root zone, as compared with 50 to 55 percent application efficiency levels with gravity systems. Moreover, there is greater uniformity of application across the field with center pivot systems. In short, center pivot technology can essentially double water use efficiency.
- ***Energy Efficiency:*** Associated with the water efficiency, there is considerable energy savings in

pumping and distributing the water, which can easily be as much as $30 per irrigated corn acre.

- ***Efficiency Gains from Precision Agriculture:*** Although more difficult to measure, there are clearly both input cost savings and production enhancement opportunities which can be better achieved with center pivot technology. For producers farming larger acreages, these gains convert into very significant revenue impacts.

Given the above, it is interesting to see how the markets for agricultural cropland respond. Do they reflect a *center pivot premium*?

Using annual historical data from our UNL Nebraska Farm Real Estate Market Developments series for the East Statistical Reporting District, as well as the state as a whole over the past 24 years, we find quite interesting shifts in land values and cash rental rates for the irrigated land classes. While both classes of irrigated land (center pivot and gravity) have shown strong gains in value and rents over the period, the center pivot irrigated land class has advanced more sharply.[3]

Using the per acre value metrics from the transfer market, we find that gravity irrigated land commanded the higher values early in the period, in part reflecting the fact that center pivot technology allowed lower-quality land to come into irrigation. But also, quite likely there was a more limited market understanding of the advantages which center pivot irrigation technology provided. So for a time there was, in fact, a *discount* rather than a *premium*. That changed, however, with a clear reversal in relative values by 1998 in the East District and by 2006 for the state as a whole.

In Figure 1 (on next page) we have indexed the land value trend relationships of center pivot irrigated land to that of gravity irrigated land. When that index is greater than one, we can say there essentially is a *center pivot premium* operating in the transfer market. And indeed, that premium is evident and gradually growing over time. Currently, in 2013 the index of 1.15 for the East District suggests that a parcel set-up for center pivot irrigation (not including the cost of the center pivot system itself) would bring a 15 percent premium over comparable gravity irrigated land (which would not be capable of converting). For example, if the gravity system sells for $10,000 per acre, the same parcel, if capable of being irrigated with center pivot technology, would likely fetch $11,500 per acre. (Note: Center pivot values in our UNL series do not include the value of the center pivot system itself.)

The story is similar for cash rents. Analyzing the historical data for the East Region of the state shows that until 1994/1995 the cash rents for gravity irrigated cropland were almost equal to center pivot cropland (Figure 2 on next page). However, since 1996 the cash rents for center pivot cropland have been higher than that of gravity**.** This year (2013) the cash rental rates for center pivot irrigated cropland is averaging $35 per acre higher than gravity irrigated rates in the East District, implying a rent premium of over ten percent. That is a premium, even recognizing the fact that Eastern Nebraska center pivot rental rates are sometimes negotiated for the complete parcel with corners that are not irrigated, and thus farmed as dryland cropland.

In summary, market participants in both the land transfer and land rental markets do recognize the *center pivot premium*, and for good reason. In fact, our data suggest this premium is gradually increasing over time as general understanding of the benefits of this technology grows. Conversely, land that is currently gravity irrigated, and due to particular features precluded from conversion to center pivot irrigation, will actually experience a mirror image penalty — a *gravity irrigation discount.*

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[1] Johnson, Bruce, Christopher Thompson, Anil Giri and Sara Van Newkirk. *Nebraska Irrigation Fact Sheet*, Department of Agricultural Economics, Report No. 190, September 2011.

[2] Klein, Robert N. and Roger K. Wilson. *Crop Budgets-Nebraska 2013*, EC 8722, January 2013.

[3] Johnson, Bruce, Jim Jansen, Anil Giri, Boone McAfee and Ethan Smith. *Nebraska Farm Real Estate Market Highlights 2012—2013*, Department of Agricultural Economics, Report No. 193, forthcoming.

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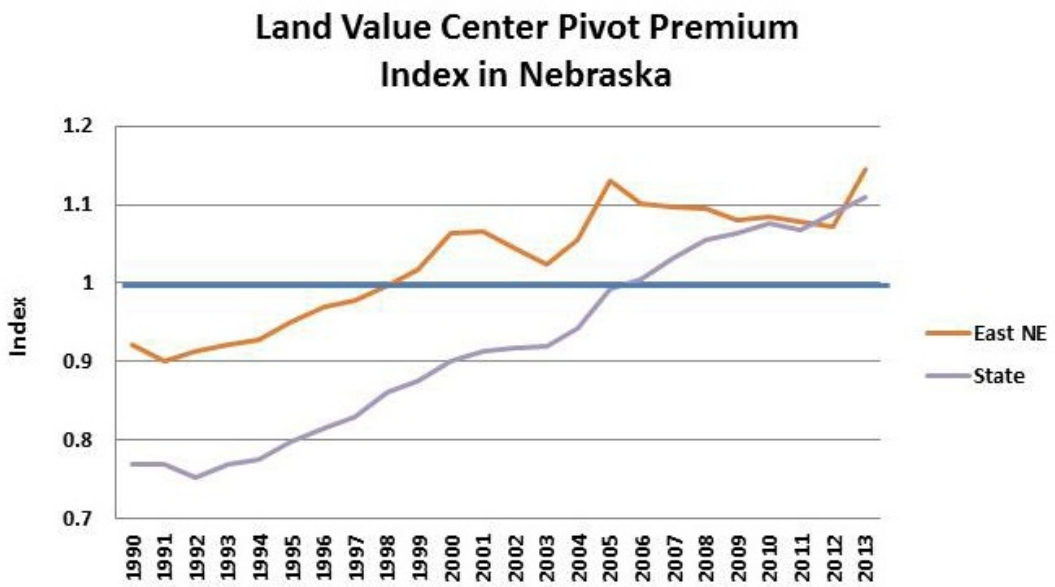


**Figure 1.**

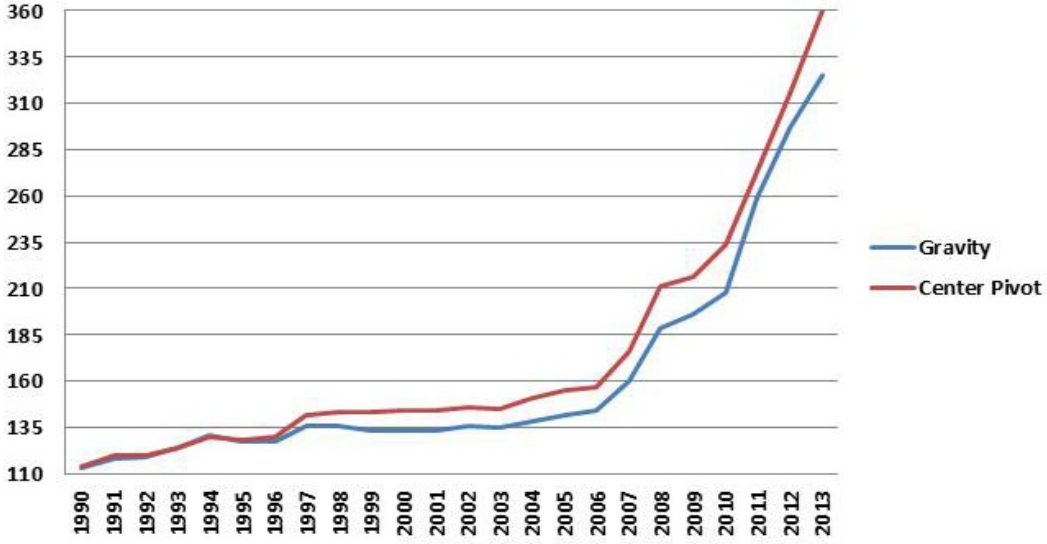


**Figure 2.**

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