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## Has the Ethanol Industry Impacted Nebraska Land Values?

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# CORNHUSKER ECONOMICS

## Has the Ethanol Industry Impacted Nebraska Land Values?

Market Report	Yr Ago	4 Wks Ago	4/3/09
<b><u>Livestock and Products,</u></b>			
<b><u>Weekly Average</u></b>			
Nebraska Slaughter Steers, 35-65% Choice, Live Weight. . . . .	\$86.30	\$81.44	\$84.76
Nebraska Feeder Steers, Med. & Large Frame, 550-600 lb. . . . .	117.06	112.22	113.00
Nebraska Feeder Steers, Med. & Large Frame 750-800 lb. . . . .	98.93	94.57	94.86
Choice Boxed Beef, 600-750 lb. Carcass. . . . .	138.07	134.87	135.20
Western Corn Belt Base Hog Price Carcass, Negotiated. . . . .	55.13	62.50	56.82
Feeder Pigs, National Direct 50 lbs, FOB. . . . .	38.64	60.00	70.00
Pork Carcass Cutout, 185 lb. Carcass, 51-52% Lean. . . . .	56.90	56.00	56.49
Slaughter Lambs, Ch. & Pr., Heavy, Woolled, South Dakota, Direct. . . . .	*	93.25	97.75
National Carcass Lamb Cutout, FOB. . . . .	255.69	248.44	249.90
<b><u>Crops,</u></b>			
<b><u>Daily Spot Prices</u></b>			
Wheat, No. 1, H.W. Imperial, bu. . . . .	9.58	4.97	5.30
Corn, No. 2, Yellow Omaha, bu. . . . .	5.66	3.51	3.93
Soybeans, No. 1, Yellow Omaha, bu. . . . .	12.01	8.65	9.77
Grain Sorghum, No. 2, Yellow Dorchester, cwt. . . . .	9.70	5.18	6.02
Oats, No. 2, Heavy Minneapolis, MN, bu. . . . .	3.79	1.87	2.04
<b><u>Feed</u></b>			
Alfalfa, Large Square Bales, Good to Premium, RFV 160-185 Northeast Nebraska, ton. . . . .	135.00	190.00	190.00
Alfalfa, Large Rounds, Good Platte Valley, ton. . . . .	85.00	77.50	77.50
Grass Hay, Large Rounds, Premium Nebraska, ton. . . . .	*	140.00	85.00
Dried Distillers Grains, 10% Moisture, Nebraska Average. . . . .	160.00	127.50	129.50
Wet Distillers Grains, 65-70% Moisture, Nebraska Average. . . . .	62.87	45.62	49.25
<b>*No Market</b>			

The growth of the United States ethanol industry has been quite extensive, especially in Nebraska, where production has grown from 523 million gallons per year in 2005, to 1,115 million gallons per year in 2008 (Nebraska Energy Office, 2009). Rural areas are at an advantage for attracting ethanol plants, as prospective plants want to locate as close as possible to its chief resource - corn. In exchange for locating near its feedstock, ethanol plants offer higher prices in the competition for corn, which in turn has impacted farm income. Surprisingly, little research has been done with regards to an ethanol plant's impact on farmland values.

The purpose of this study was to use actual sales data from the Nebraska Department of Revenue Property Assessment Division (NDR), to measure the impact of an ethanol plant on the surrounding region's agricultural land market. The sales data provided by the NDR was compiled from actual transactions. For each real estate sale in Nebraska, a transactions statement (Form 521) must be filed at the county assessor's office. County assessors then send those sales which are deemed to represent "arms-length" transactions, to the NDR for final review. The sales used in the Form 521 data set have been through this filtering process and are considered representative of the area.

The ethanol plant analyzed in this study is Husker Ag, LLC of Plainview, Nebraska. The study areas of impact are the counties of Antelope, Cedar, Knox, Madison, Pierce, Stanton and Wayne, as well as the eastern portion of Holt County (Figure 1 on last page). This group of counties was selected because of its relative distance from other ethanol plants, which could affect the plant's possible influence on land values. The plant also came online in 2003, so multiple years of data could be used to trace possible impacts the plant may have had in the area. Our analysis tested whether land values in close proximity to ethanol plants are higher than land values farther away, the implication being that the economic activity of an ethanol plant becomes capitalized into area land values.

One of the primary methods of evaluating real estate market dynamics is by using the hedonic price model, where various factors of the market and property characteristics can be isolated to see their contributing significance to market-derived values. Hedonic modeling can be adapted for many uses, both urban and rural. One application of the hedonic price method as it relates to this study of ethanol's impact on farmland value is a study by Henderson and Gloy (2008). Data was gathered by agricultural bankers in the Federal Reserve Bank of Kansas City district, from 250 quarterly opinion survey responses. Results of the opinion survey indicated non-irrigated farmland greater than 50 miles from an ethanol plant was valued \$107 less per acre than an equivalent parcel located within the 50 mile radius. For future research the authors suggested using actual sales data, which would provide further clarification of an ethanol plant's impact on local land values. Henderson and Gloy's findings suggest farmland values closer to the Plainview plant will be greater than farmland values farther away.

The initial data set for the study from the NDR contained 1,537 sales, which had occurred between January 1, 2004 and December 31, 2008. After filtering the data and removing transactions less than 40 acres in size, there remained a total of 961 representative farmland sales in the multi-county study region. The amount of sales data is one strength of the study. While being much greater than the amount required to be statistically significant, it also contains more observations than used in previous studies. Moreover, the Form 521 sales data for each parcel is very detailed, including sale date, buyer, seller, sale amount, legal description, zoning, parcel size and soil classification, among others. The sale date is important because another ethanol plant opened in Norfolk, Nebraska in 2007, which created some competition for the Plainview plant.

The average sale price per acre of tract in the data set was \$2,085. Prices ranged from \$313 per acre to \$6,800 per acre. The average parcel size was 188 acres. The minimum parcel size was set at 40 acres in order to avoid sales with the intention of converting the land to acreages. The average distance of a sale to an ethanol plant was nearly equal between Plainview and Norfolk, with the average distance of sales to Plainview being 29.9 miles and to Norfolk, 31.2 miles. The farthest distance to Plainview was 53.9 miles and to Norfolk was 70.4 miles. When the minimum distance to an ethanol plant was calculated, the average distance was 20.6 miles.

The minimum distance variable was measured in the regression by whether it had a positive or negative sign. If the distance variable was negative, it meant the value of farmland would decrease as the distance from the ethanol plant was increased. If it was positive, the interpretation would be that farmland value would increase as distance from the plant was increased. When tested, the minimum distance variable was positive, which was unexpected and didn't support the hypothesis. A variation of the distance variable was used to indicate any pricing due to geographical factors.

While the Henderson and Gloy study suggested that profits received when located within a 50 mile radius of an ethanol plant were capitalized into farmland values, this study found no significant evidence of increased farmland values due to closer proximity to an ethanol plant. There was no support to the hypothesis that proximity to an ethanol plant location has a direct impact on area agricultural land values. Though a variety of analysis configurations (model specifications) were used, none displayed any significant effect of the ethanol plant proximity variable. The fact that the results are based on actual sales price data of representative land sales, lends credence to our findings.

Other factors, such as profits in other agricultural enterprises, outside investment and stronger farm financial statements have contributed to the competitive agricultural real estate climate in recent years.

The location issue of parcel proximity to plant can also be eroded by changing farm technology. One issue which was not included in the study was that many farmers have chosen to upgrade grain hauling practices, switching from straight trucks to semi-trucks; thus making the per-bushel transportation cost difference between hauling 15 miles and 50 miles diminish. So, while excitement over the ethanol industry as a whole may have led to some upward land value movements across the major grain ethanol producing states, our study provides no empirical support of a local impact on land values relative to geographic proximity.

It should be noted, however, that the results for the study area are not meant to be universally applied to other plant locations. Further research is needed in other areas of Nebraska and the U.S. where ethanol plants have been built since the early 2000s. Corn price and basis differences from the ethanol plant and surrounding area could provide further insight on the capitalization of price impacts on farmland values.

#### References:

- Henderson, J. and B. A. Gloy. 2008. "The Impact of Ethanol Plants on Cropland Values in the Great Plains." Regional Research Working Paper, Federal Reserve Bank of Kansas City.
- Nebraska Energy Office. 2009. "Ethanol Facilities Capacity by State and Plant." Lincoln, NE.  
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Figure 1. Eight County Region of Study (Highlighted)

