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Irrigation Pumping Costs

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Market Report	Yr Ago	4 Wks Ago	8/24/01
Livestock and Products, ***Average Prices for Week Ending***			
Slaughter Steers, Ch. 204, 1100-1300 lb Omaha, cwt	$65.83	$ *	$70.90
Feeder Steers, Med. Frame, 600-650 lb Dodge City, KS, cwt	82.00	94.75	99.75
Feeder Steers, Med. Frame 600-650 lb, Nebraska Auction Wght. Avg	99.95	108.20	103.90
Carcass Price, Ch. 1-3, 550-700 lb Cent. US, Equiv. Index Value, cwt	101.74	112.69	109.42
Hogs, US 1-2, 220-230 lb Sioux Falls, SD, cwt	45.00	50.25	48.00
Feeder Pigs, US 1-2, 40-45 lb Sioux Falls, SD, hd	41.20	42.33	*
Vacuum Packed Pork Loins, Wholesale, 13-19 lb, 1/4" Trim, Cent. US, cwt	115.75	121.50	121.40
Slaughter Lambs, Ch. & Pr., 115-125 lb Sioux Falls, SD, cwt	74.13	55.87	50.12
Carcass Lambs, Ch. & Pr., 1-4, 55-65 lb FOB Midwest, cwt	168.00	157.28	132.73
Crops, ***Cash Truck Prices for Date Shown***			
Wheat, No. 1, H.W. Omaha, bu	2.99	2.55	3.04
Corn, No. 2, Yellow Omaha, bu	1.49	2.04	1.87
Soybeans, No. 1, Yellow Omaha, bu	4.42	5.20	4.73
Grain Sorghum, No. 2, Yellow Kansas City, cwt	2.73	3.68	3.63
Oats, No. 2, Heavy **Minneapolis, MN , bu	1.18	1.62	1.51
Hay, ***First Day of Week Pile Prices***			
Alfalfa, Sm. Square, RFV 150 or better Platte Valley, ton	110.00	102.50	102.50
Alfalfa, Lg. Round, Good Northeast Nebraska, ton	77.50	75.00	67.50
Prairie, Sm. Square, Good Northeast Nebraska, ton	77.50	105.00	105.00

* No market.
** The Sioux City portion of the report has been discontinued - we will be getting oat prices from Minneapolis, MN.

Energy prices have risen dramatically in the last two years, with changes also taking place in relative prices between energy sources. Representative prices paid for three major energy alternatives over the last five years are reported below in Table 1. Actual prices paid have also varied considerably depending upon when the fuel was purchased during the year and the supplier. The cost of natural gas (not reported here) and electricity, are complicated with total energy supply costs that depend upon both consumption and annual connect charges. Electricity rates also depend upon the frequency of interruption of service selected. The total cost for electricity for irrigation (including consumption and connect charges) averaged about 8.8 cents per KWH in Nebraska in 2001. The rates reported in Table 1 are for anytime interruptible which is the most economical rate. The Southern Power rates reported in Table 1 are also some of the lowest in the state.

Producers evaluating their energy alternatives have the uncertainty of future prices. It was recently announced for example, that wholesale electricity prices will increase 8 percent in Nebraska. Each power district will be determining how they will pass that added cost on to their customers. As illustrated in Table 1, however, electricity rates have been much more stable than fossil fuel prices in the past. The difference between the high and low diesel prices in Table 1 is over 50 percent, while the electricity rates reported varied a maximum of 8 percent. Table 1 also shows that price relationships have changed over the last five years to where diesel was most favorably priced relative to LP in 2001, but was more expensive relative to electricity (compared to 1997-99). The relationship between LP and diesel will likely continue to change. The relationship between diesel and electricity prices are discussed further below.

The recent increases in energy prices have triggered a renewed interest in evaluating pumping alternatives.

However, a careful evaluation requires considering the repairs and ownership costs (depreciation, interest, taxes, insurance) as well as the energy costs. Total system costs are presented in CC371, *Estimated Irrigation Costs, 2001*, a Nebraska Cooperative Extension publication that was recently updated and is available through the University of Nebraska Cooperative Extension offices. A spreadsheet is being developed for evaluation of the pumping costs alone that will be available this fall.

Example results from comparing pumping costs are provided in Table 2. The 10 psi (pounds per square inch) systems are gravity and the 35 psi systems are pivots. The operating costs include the diesel fuel, oil and estimated repairs. The ownership costs include depreciation, interest, insurance and property taxes on the power unit, engine and generator mount (for pivots), fuel tank, power unit, gearhead, pump and generator (for pivots).

The breakeven $/kwh shown in Table 2 is based on 875 hours annual pumping and includes the connect charge in the $/kwh, i.e., dividing the connect charge by the annual kwh and adding that connect charge/kwh to the consumption charge per kwh. As indicated in Table 2, the breakeven $/kwh decreases with the lift and pressure, i.e. the more competitive the diesel system is the larger the power requirement.

The results in Tables 1 and 2 depend critically upon the operating efficiency of the system and component costs. Also, the electricity costs include wiring costs from the field edge, but do not include any charge for bringing electricity to the field. The comparisons provided here were intended for illustration purposes. The specifics of each situation need to be considered. Also, reference to propane and natural gas were limited due to space. See the Extension materials cited above for a more detailed treatment.

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Table 1. Representative Energy Prices, 1997-2001

Energy Prices	1997	1998	1999	2000	2001	5 Year Ave.
Diesel/gal	$0.84	$0.71	$0.67	$1.02	$1.02	$0.852
LP/gal	$0.69	$0.62	$0.55	$0.77	$0.99	$0.724
Electricity/kwh	$0.038	$0.038	$0.038	$0.036	$0.039	$0.0378
Price Ratios						
Diesel/LP	$1.22	$1.15	$1.22	$1.32	$1.03	$1.18
Diesel/Electric	$22.11	$18.68	$17.63	$28.33	$26.15	$19.15

Notes:

Diesel and LP: Prices excluding state road taxes and federal excise tax. Nebraska Agri-Facts, Prices Paid by Farmers for Fuel, April bulk delivery, Northern Plains, various issues, Nebraska Agricultural Statistics Service.

Electric: Nebraska Southern Power District anytime/multiple rate for irrigation. Does not include $12/hp connect charge that remained constant over the period 1997-2001.

Table 2. Annual Diesel Pumping Costs and Breakeven Total Costs of Pumping, Diesel vs. Electric

		Diesel $1/gal		Electric
Lift (ft)	**Pressure (Psi)**	**Operating Cost**	**Ownership Cost**	**Breakeven$/kwh**
50	10	$1,869	$1,459	.142
125	10	$3,288	$1,575	.106
200	10	$4,789	$1,788	.097
275	10	$6,355	$2,151	.096
50	35	$2,691	$1,743	.114
125	35	$3,811	$1,842	.097
200	35	$5,013	$2,116	.094
275	35	$6,281	$2,459	.093