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Energy Conservation through Improved Irrigation Pumping Plant Performance

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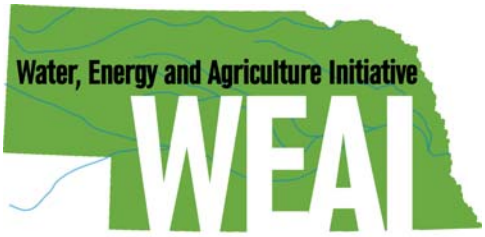

Water, Energy and Agriculture Initiative

Energy Conservation through Improved Irrigation Pumping Plant Performance

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ABSTRACT. Nebraska has approximately 90,000 active irrigation wells that are powered by electric motors or gasoline, natural gas, propane or diesel fueled engines. Pumping plant performance data collected prior to 1990 indicated an average performance rating of 77 percent of the Nebraska Pumping Plant Performance Criteria (NPPPC). More recent tests confirm that pumping plant performance remains well below the Nebraska Criteria. Though significant improvement has been made in the brake horsepower output per unit of fuel for internal combustion engines, recent increases in fuel costs have more than doubled pumping costs during the past 3 years. Efficient irrigation pumping plants could save an average of 25-30 percent of the energy used to pump irrigation water through properly matching and adjusting the pump and motor to current operating conditions. Improvement in pumping plant performance will reduce peak electrical loads, and could potentially save irrigators 508 million kilowatt-hours or $40 million per year in energy costs based on electrical costs of $0.08 per kilowatt-hour.

The Water, Energy and Agriculture Initiative funds research to maximize the efficiency with which water and energy resources are used to sustain economic development and water conservation in Nebraska agriculture.

The Nebraska Center for Energy Sciences Research administers the initiative, which was created in 2008 through a partnership of the center, the Nebraska Public Power District, the Nebraska Corn Board, the Nebraska Soybean Board and UNL's Agricultural Research Division.

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