



## **USDA-CSREES 2007 National Water Quality Conference**

### [Do More Efficient Centers Pivots Reduce Groundwater Consumption?](#)

More efficient center pivot irrigation technologies have been adopted by many producers in western Kansas in recent decades. While these technologies have clearly provided economic benefits to producers, their effect on the depletion rate of the Ogallala aquifer is less clear. In administering water policy, State agencies are required to achieve an absolute reduction in consumptive use of groundwater. The State of Kansas currently has a cost share program aimed at increasing irrigation efficiency and reducing water consumption. The purpose of this study is to evaluate the effects of this program on groundwater use. To conduct our empirical analysis, we assemble a comprehensive, parcel-level database on groundwater use and related variables, including irrigation technology, irrigated acreage, the crop grown, soil attributes, hydrologic data, crop and energy prices, and weather conditions. These data were compiled for all counties in western Kansas with significant areas overlying the Ogallala aquifer for the period 1996-2004. The method of analysis was statistical regression of groundwater use on a set of causal factors. We find that the effect of technology on groundwater use differs by the type of technology and the crop being grown, and that net water use may decrease in certain cases but increase in others. The evidence from this research suggests that cost share programs for improving irrigation efficiency may have a limited effect on groundwater consumption, and may have been counterproductive in certain cases. While producers apply sound economic judgment in adopting efficiency enhancing technology, and have reduced crop specific water consumption over time, cost share programs may have had the unintended consequence of increasing groundwater usage.

Author: Bill Golden

University Affiliation: Kansas State University

Co-Author(s): Jeff Peterson