



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

### Testing N fertilizer recommendation models in soils with different yield potentials

Field testing of N fertilizer models shows that in many states there is poor relationship between N recommendations and economic optimum N rates. The objective for this study was to determine the influence of soil yield regime on the ability of N fertilizer recommendation models from South Dakota, Minnesota, Iowa, and Nebraska to predict economic optimum N rates of a three year field study conducted in eastern South Dakota. Findings from this study showed that: 1) in low and high soil yield regimes, water use efficiencies were increased by applying N fertilizer; 2) soil in the high yield regime mineralized 19% more N than soil in the low yield regime; 3) plants grown in high yield regime were more efficient at using N derived from both the soil and fertilizer than corn grown in a low yield regime; 4) additional N fertilizer was not required to capture higher yields in the high yield regime; and 5) the South Dakota and Minnesota N recommendation models had the lowest root mean square errors (RMSE) for low fertilizer costs and high corn value while the Nebraska model had the lowest RMSE for high fertilizer costs and low corn value. Findings from this study show that N recommendations and producer confidence in N recommendations can be improved by developing N models that account for landscape processes.

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