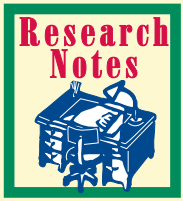


# Colorado: Precision Farming Strategies in Western Great Plains Irrigated Agriculture Research Project

This precision farming research project is a multi-disciplinary, multi-site, multi-crop, multi-agency undertaking that encompasses several facets of agricultural science. It is a cooperative effort between various academic departments at Colorado State University (CSU) and the USDA-ARS Water Management Unit in Fort Collins (see acknowledgments below). This study is being conducted on three farmer fields in Colorado. Field sites are located near Greeley, Wiggins, and Yuma.

The Western Great Plains area is among the leaders in U.S. crop production. Corn grain yields in this region usually exceed the national average. Such high yield production requires significant quantities of inputs, including irrigation, nutrients, and pesticides. However, due to inherent spatial variability in the field, not all areas require the same input levels.

One focus of this project is to develop and assess various techniques of identifying production level management zones (MZs). Four different techniques are being investigated to delineate MZs into regions of high, medium, and low yield productivity. The idea is to manage inputs variably in each MZ to optimize crop production and profits on farmer fields. The goal is to maximize yield and minimize potential environmental degradation due to over-application of inputs.

Four different methods of delineating MZs are being investigated. Within each management zone approach, eight methods of nitrogen (N) application are being studied to assess which method results in the highest N use efficiency, grain yield, and economic returns. Treatments are replicated up to four times in each field. Variable-rate N applications are made along the experimental strips based on MZs from the four approaches.

The goal of the N management aspect of the project is to determine which N treatment and MZ approach maximizes farm profitability while minimizing potential environmental degradation. Another objective is to determine levels of spatial nutrient uptake and removal by corn plants. Nitrogen, phosphorus (P), potassium (K), zinc (Zn), and several other nutrient uptake rates and removal concentrations are being analyzed to determine if plant uptake and removal vary across MZs. BC

***Acknowledgment of the multi-disciplinary team:***

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