



USDA-CSREES 2007 National Water Quality Conference

Conserving Water with Variable-Rate Irrigation

Water conservation has become a critical issue in Georgia due to ongoing lawsuits and drought periods. In the last irrigation survey, over 1.5 million acres of agricultural land were irrigated with an average of 7.2 inches of water. This means over 290 billion gallons of water were used to irrigate crops. In Georgia, there are over 11,000 center pivot irrigation systems accounting for nearly 1.1 million acres of irrigation farm land. Yet very few fields are uniform - most have variable topographic and soil conditions with corresponding soil water variations. Most center-pivot irrigation systems currently in use apply a constant rate of water and the ability to vary application rates over an entire field has not been possible. Many of these pivots also apply water to non-cropped or off-target areas. The University of Georgia Precision Ag team has partnered with an Australian company, Farmscan, to develop a user-friendly and reliable/robust control system for center pivot irrigation, Variable-Rate Irrigation (VRI), which enables the delivery of irrigation water in optimum amounts over an entire field. VRI varies application amounts by cycling sprinklers on and off and by varying the system travel speed. Desktop PC software is used to define application maps which are loaded into the VRI controller. The VRI system uses GPS to determine pivot position/angle of the CP mainline. Over 30 VRI systems have been installed in Georgia and their use will conserve about 17% of the irrigation water normally applied in an "average" rainfall year. VRI systems have also been installed in Florida, South Carolina and Arkansas.

Author: Calvin Perry

University Affiliation: University of Georgia

Co-Author(s): Gary Hawkins, Andrea Milton and George Vellidis