



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2003FL38B

Title: Evaluation of Water Use and Nutrient Leaching with High Frequency Irrigation for Use in Best Management Practices

Project Type: Research

Focus Categories: Water Quantity, Nitrate Contamination, Irrigation

Keywords: Agriculture, Fertilizers, Groundwater Quality, Irrigation Management, Leaching, Nitrogen, Nutrients, Percolation, Solute Transport, Water Quality

Start Date: 03/01/2003

End Date: 02/28/2004

Federal Funds: \$16494.00

Matching Funds: \$33082.00

Congressional District: 6th

Principal Investigators: Dukes, Michael

Abstract: Agricultural irrigation is the largest category of freshwater withdrawals in Florida. With increased competition for limited water resources, agriculture needs to use water more efficiently. In addition, nitrate levels in the ground and surface waters of several river basins have increased. Excessive irrigation can waste water and cause excessive losses of nitrogen. Biological growth in the Suwannee River is limited by nitrogen; therefore, addition of this nutrient into the ecosystem results in growth of algae which can ultimately cause eutrophication. The proposed work aims at maintaining crop production while reducing environmental impact and crop water use. It will consist of several levels of automatically initiated irrigation treatments and the producer practice of once daily irrigation on a typical vegetable crop in the Suwannee Basin. Nitrogen movement in each treatment will be monitored by soil sampling throughout the soil profile. Injection of a water soluble dye will be used to show farmers how water and nitrate behave in the root zone and below as part of the technology transfer program. Results from this project will identify a combination of irrigation rates and or methods on vegetable crops that result in reduced leaching of nitrogen below the root zone. Furthermore, the amount of nitrogen leached below the root zone will be calculated to help determine Total Maximum Daily Loads. Interaction between the

maximum crop yield and the minimum loss of nitrogen will be studied and Best Management Practices that result in the highest yield with the minimum pollution to ground water will be identified. This will benefit producers in the region and in the state to meet stricter regulations with regard to nonpoint source pollution and Total Maximum Daily Loads.

[U.S. Department of the Interior](#), [U.S. Geological Survey](#)

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