

POTENTIALS OF VARIABLE RATE IRRIGATION FOR VEGETABLE PRODUCTION IN SOUTH FLORIDA

Haimanote K. Bayabil, Fitsum T. Teshome, and Christian Bartell

Agricultural and Biological Engineering, Tropical Research and Education Center, University of Florida, Homestead, FL, USA.

Florida's vegetable industry contributes significantly to the state's economy with an estimated annual economic return of \$1.34 billion. The state is one of the top producers of sweet corn and green beans in the country. Irrigation is critical for vegetable production in the state due to uneven rainfall distribution. Irrigation management is even more crucial in regions like South Florida that heavily depend on shallow aquifers as freshwater sources for drinking and irrigation. This is because soils in South Florida are often shallow, highly permeable, and with low water holding capacity. Precision irrigation management practices have great potential for not only conserving freshwater quantity but also protecting water quality by reducing nutrient loading from excess irrigation. A field study is being conducted to investigate the potentials of variable rate irrigation (VRI) system for green beans and sweet corn production at the Tropical Research and Education Center (TREC). Thirty-two experimental plots (each 9 m long x 5.5 m wide) were established under a linear move VRI system. The experiment involves four irrigation levels (100, 125, 150, and 175% of maximum allowable depletion (MAD)) based on rootzone soil moisture readings. Experimental plots are equipped with soil (moisture, temperature, electrical conductivity) sensors, free drainage lysimeters, above canopy infrared (IRT) sensors, and a weather station. In addition, drone images are collected daily using multispectral and thermal sensors. In this presentation, we will share preliminary study results; and challenges and opportunities of using a VRI system for vegetable production will be discussed.

PRESENTER BIO: Dr. Bayabil is an Assistant Professor of Water Resources. He has a research and extension appointment. His program focuses on developing efficient water management practices that not only conserve water but also protect water quality and ensure optimal plant growth and yield.