

AGRICULTURAL WATER CONSERVATION IN THE LOWER FLINT RIVER BASIN OF GEORGIA

By investing in 'smarter' irrigation, farmers are conserving water while enhancing productivity and yields.

Improving the efficiency of agricultural water use is a shared goal of farmers, researchers and conservationists. Since 2000, these groups have leveraged significant resources to develop and deploy new conservation based technologies in the Lower Flint River Basin of southwest Georgia. The goal is to move innovative agricultural water conservation practices from the research laboratory to the working farm so as to determine economic feasibility, field functionality and conservation impact. Projects are funded through contributions from farmers and cost-share programs. Farmers in the Lower Flint River Basin of Georgia are employing (5) key water conservation measures:

1. Low pressure drop nozzle retrofits with end gun shut-off:

Savings are generated by applying irrigation water at a lower pressure nearer the soil surface to reduce evaporation and wind drift losses; installing end gun controls to keep irrigation inside the field boundary; and, repairing leaks. *Retrofits (LDR) reduce water use by up to 22.5%.*

2. Variable rate irrigation:

Savings are generated by removing non-crop areas from irrigation; coordinating application amounts with variations in soil type and field topography; and, eliminating double application due to pivot overlap. *Variable rate irrigation (VRI) reduces water use by an average of 15%.*

3. Advanced irrigation scheduling:

Savings are generated by identifying precise periods of time in which a farmer can irrigate less by using objective field data such as soil moisture, soil temperature, crop growth stage and localized ET. *Advanced irrigation scheduling (AIS) reduces water use by up to 15%.*

4. Conservation tillage:

Savings are generated by using a cover crop and leaving plant residue in the field, which modifies plant rooting structure and physiology to enable more efficient water use by crops; improves water holding capacity in the soil; increases water infiltration rates; and, reduces soil temperature, evaporative loss and field run-off. *Conservation tillage (CT) reduces water use by up to 15%.*

5. Sod based rotation:

Savings are generated by incorporating a rotation of a warm season perennial grass into a conservation tillage based production system which yields improved soil quality and water holding capacity, and increased water infiltration and retention. *Sod based rotation (SBR) reduces water use by up to 30%.*

Note: These measures, while in many cases complementary, are not necessarily additive as per the savings generated. Water conservation estimates are based on an average application rate of 13 acre inches per field in a dry year. Estimated reductions in water use are based on field experience, ongoing research and the *Project Report 32: Irrigation Conservation Practices Appropriate for the Southeastern United States*. Average cost per acre to deploy is \$100–LDR, \$175–VRI, \$40–AIS, \$40–CT and \$400–SBR. Many of these practices create economic and environmental benefits beyond water conservation which help to offset per acre cost.

Who we are? This information is provided by David Reckford, *Flint River Basin Partnership*; Calvin Perry, *UGA C.M. Stripling Irrigation Research Park*; Rad Yager, *UGA Cooperative Extension*; Jim Marois and David Wright, *UF/IFAS Extension*; Wilson Faircloth, *USDA–ARS*; Richard Barrett, *USDA–NRCS*; and, Marty McLendon, *Flint River SWCD*.

Why the Lower Flint? Incorporating 27 counties in southwest Georgia, the Lower Flint is one of the most diverse and ecologically rich river systems in Georgia. Together with the upper part of the Apalachicola, the area is home to the highest density of reptile and amphibian life in the United States, and four federally protected mussel species — the Fat threeridge, Gulf moccasinshell, Oval pigtoe and Shinyrayed pocketbook. The area is also one of the most agriculturally intensive regions in Georgia with more than 40% of the Basin's land mass producing \$2 billion in farm based revenue annually. Irrigation is central to production with 6,250 center pivot systems in operation.

The Flint River Basin Partnership was formed by the Flint River Soil and Water Conservation District, Natural Resources Conservation Service and The Nature Conservancy to promote agricultural water conservation in the Lower Flint.

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