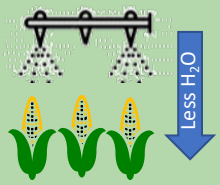
Increasing Adoption of Climate- & Water-Smart Irrigation Practices Among Tennessee Valley Farmers in Alabama & Tennessee: Findings and Lessons Learned (2017-2021)

This NRCS-funded project focused on on-farm evaluation and demonstration of irrigation best management practices (BMPs): climate forecast-based water withdrawals during winter for irrigation in summer, use of soil sensors for irrigation scheduling, variable rate irrigation (VRI), better irrigation system operation and maintenance, and facilitating peer-to-peer knowledge exchange and skills development to support adoption of BMPs.

Increase Crop Water Use Efficiency



The use of soil sensors to support irrigation scheduling and variable rate irrigation (VRI) helps farmers reduce risk of yield losses, save water, better allocate water across a field, and increase revenue.

Withdrawal Water Using Climate Forecast

El Niño Southern Oscillation (ENSO) influences the south-eastern climate. More water withdrawal and water storage in northwest Alabama during La Niña phase of ENSO could guarantee water availability for irrigation in the summer.

Right Irrigation Timing

Irrigation scheduling using soil water tension (SWT) sensors will now be easier for farmers and consultants. SWT values indicating irrigation initiation for major soil types in Alabama were determined. Additional validation is needed.

Right Irrigation Rate @ Right Place

Spatial variability of soil moisture and yield across rolling terrain fields can be explained by topographic indices (TWI and TPI). Delineation of irrigation management zones should incorporate those indices.

Better Nutrient and Irrigation BMPs

Field variability of soil phosphorus (P) levels was linked to soil moisture variability, terrain elevation, and eroded areas. Variable rate fertilization and irrigation could reduce soil P loss and minimize yield losses.

Peer-to-Peer Knowledge Exchange

Farmers focus groups allowed farmers to share with their peers experiences with current and new irrigation practices. Hands-on trainings and experimentation also increased knowledge and skills.

Farmers using climate and water-smart irrigation practices can:

Maintain or Increase Yield

Less water applied on parts of the field where soils hold more water did not impact crop yield or yield variability.

Save or Better Allocate Water

Northwest AL site (2020):
High yielding zone:
9.5% less water
than low yielding zone*

→ 6.2% increased revenue with respect to dry land

*Revenue in the low yielding zone increased by 4.6% as compared to dry land.

Southeast AL site:
28% less water – 2018 wet year
16% less water – 2019 dry year

Increase Revenue

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