

Post Oak Savannah Water Conservation and Improved Efficiency Education Program

Introduction

Water conservation is crucial for the sustainability of both aquifers and groundwater-fed irrigated agriculture. Combining modern technology with the implementation of best management practices (BMPs) allows irrigators and residential water users to optimize the available water supplies to meet current and future demands. Adopting new technologies and BMPs capable of balancing water use and conservation requires rigorous capacity development activities such as educational programs that include classroom and in-field training. Practical, science-based techniques and technologies such as soil moisture (SM) sensors and irrigation scheduling allow irrigators to conserve groundwater by reducing water use while maintaining or improving crop yield. Irrigation scheduling is one of the most effective approaches to conserving agricultural water while maintaining and improving crop yield. Making the right decisions regarding the timing and quantity of irrigation is essential, and modern technology can significantly impact consumptive use. Additionally, SM sensing is an effective decision-making tool to assist growers with irrigation scheduling by providing a timeline of water in the root zone and estimating water consumed by crops or lost to deep percolation. Adopting this technology can reduce water use by preventing over-or under-watering of crops, reduce water lost with improved system efficiency, and improve crop yield potential for the user. These technologies are constantly evolving to increase accessibility to agricultural users, with recent advancements allowing growers to access data both online and on mobile devices. Post Oak Savannah Groundwater Conservation District (POSGCD) will provide a grant/rebate to irrigators willing to install SM sensors on their farms and implement water-conserving BMPs. To be considered eligible for this program, the growers will be required to undergo training for water conservation using modern approaches and tools for center pivot and surface (furrow) irrigation practices. Per POSGCD's request, the Texas A&M AgriLife Extension Service, Texas Water Resources Institute (TWRI), will also utilize SM sensors to estimate potential water savings that may result from on-farm technology usage.

In addition, to fill the gap in outreach for optimizing residential water use, a Rainwater Harvesting (RWH) program will be implemented for homeowners in local communities. RWH is an innovative alternative water supply approach anyone can use. RWH captures, diverts, and stores rainwater for later use. This program will serve the water managers' need for a well-received educational program that can reduce residential water demand based on methods easily adoptable in the area. Implementing rainwater harvesting is beneficial because it reduces demand on existing water supply, reduces run-off, reduces erosion, and aids in groundwater recharge. RWH will be complemented with training on sustainable landscaping and landscape irrigation. Education coupled with the POSGCD RWH grant/rebate program for Milam and Burleson County residents will encourage them to collect rainwater, conserve and preserve the groundwater. Completing the Rainwater Harvesting training program is an eligibility requirement of the POSGCD grant/rebate program. Per POSGCD's request, the Texas A&M AgriLife Extension Service, Texas Water Resources Institute, will coordinate science-based, community-responsive education programs that improve water conservation. The following scope of work outlines specific work and deliverables to be accomplished during this work

period.

Objectives

1- To improve the capacity of agricultural water users to conserve groundwater by providing educational resources for the adoption of water-efficient irrigation methods and tools.

2- To assist the POSGCD in estimating potential water savings through the use of soil moisture sensors in agriculture.

3- To educate residential water users on water conservation practices by providing educational materials and resources, such as rainwater harvesting programs, water smart landscape design, and irrigation training to conserve and preserve groundwater.

Project Activities

Task 1 (Objective 1) – Provide agricultural producers educational resources and training opportunities about irrigation efficient technologies and water-conserving management practices.

- 1.1 – TWRI will work with POSGCD to coordinate and promote educational programs which will include: coordination with expert speakers to identify a program date, develop agendas, create promotional materials, and other activities necessary to host a successful program.
- 1.2 – TWRI will coordinate four (4) agricultural irrigation conservation programs. Programs will discuss ways to improve furrow and center pivot system efficiency through the different irrigation methods, irrigation scheduling tools, and other topics relevant to irrigators.
- 1.3 – TWRI will administer follow up evaluations to producers who had attended irrigation education programs in an attempt to measure items such as improvements made to irrigation systems, utilization of improved irrigation scheduling technologies, overall changes in irrigation practices, estimated water and fuel savings, and others.
- 1.4 – TWRI will estimate potential savings from following ET and/or soil moisture recommendations. To do so, TWRI will work with local growers to install soil moisture sensors in fields where crops are being grown. Growers will be encouraged to not change their behavior, irrigating as they normally would. Using ET and soil moisture sensors, irrigation needs and schedules will be developed and compared against the existing irrigation practice to determine potential savings. Findings will be provided to both the grower and the POSGCD.
- 1.5 – TWRI will use the water savings developed in subtask 1.3 to estimate potential savings that could occur if the irrigation schedules were adopted across major crop growing regions of POSGCD. Estimates will be provided to POSGCD.

Task 2 (Objective 3) – Provide conservation-based programs, educational resources, and assist with outreach to encourage the most efficient use of water resources.

- 2.1 – TWRI will work with POSGCD to coordinate and promote educational programs, which will include: coordination with expert speakers, development of agendas, sign-in sheets, and other materials necessary to host a successful program.
- 2.2 – TWRI will coordinate programs focused on RWH, water-smart (EarthKind) landscapes, and landscape irrigation. Programs will discuss methods to save and deliver rainwater, create or convert to water-conserving landscapes, and efficiently irrigate residential landscapes. Specifically, these programs will be:
 - 3 Rainwater Harvesting 101
 - 2 EarthKind Landscaping
 - 1 Landscape Irrigation
- 2.3 – POSGCD and TWRI will work together to estimate the number of gallons of total storage and the number of gallons total collection potential of RWH systems installed or implemented to determine the impact of the RWH program.
- 2.4 – TWRI will work with the District to develop layouts and disseminate promotional materials such as, but not limited to: water use and conservation practices; aquifer and resource education articles or publications; available resources to well owners or water users; best practices for water use, well maintenance and water system health; drought outlook and conservation, provide edits on other materials as requested, assist with the District’s social media presence and webpage, and assist with coordinating events to encourage water conservation.

Deliverables

Task 1

- Subtask 1.1 – Develop program materials including: agendas, sign-in sheets, and post-program surveys/promotional materials as needed.
- Subtask 1.2 – Coordinate four (4) Agricultural Irrigation Best Management Practices Programs for Furrow and Center Pivot Systems.
- Subtask 1.3 – Evaluation results from producers who had attended programs estimating adoption, technology utilization, gallons saved, etc.
- Subtask 1.4 – Potential gallons saved if irrigation scheduling recommendations vs traditional irrigation practices were utilized
- Subtask 1.5 – Total potential gallons saved across major crop growing regions if irrigation scheduling recommendations were to be used.

Task 3

- Subtask 2.1 – Provide program materials including:
 - Agendas
 - Sign-in sheets
 - Educational materials as appropriate and available.
- Subtask 2.2 – Coordinate six (6) water conservation-based education programs each year. Specifically these programs will be
 - (3) Rainwater Harvesting 101

- (2) EarthKind Landscapes
- (1) Landscape Irrigation
- Subtask 2.3 – Provide estimates of the total number of gallons of rainwater collected and the storage potential of RWH systems implemented through the RWH programs.
- Subtask 2.4 – Assist with the development and dissemination of water conservation-based educational materials and water conservation-based resources for the public, including:
 - Maintained social media presence
 - Quarterly promotional materials
- Submit quarterly reimbursement requests as needed.

Budget

Salary & Fringe Benefits	\$89,619
Travel	3,504
Supplies	\$479
Other	\$17,659
Indirect Costs	\$11,126
Total Costs	\$122,387

**Amendment No. 1 to the Memorandum of Agreement
between the Post Oak Savannah Groundwater Conservation District (POSGCD)
and Texas A&M AgriLife Extension Service (AgriLife Extension) – Texas Water Resources
Institute (TWRI)**

Post Oak Savannah Water Conservation Education Program

We mutually agree to amend MOA items 2 and 11 and add Exhibit B to the MOA between POSGCD and AgriLife Extension as follows:

MOA Information	Item 11: Termination Date	Item 2: POSGCD Increase Reimbursement amt	Total POSGCD Obligation
Original MOA	5/31/2023	\$122,387	
Amendment No. 1	5/31/2024	\$122,387	\$244,774

Add Exhibit B: Year 2 Scope of Work and Budget Estimates

AgriLife PI: T. Allen Berthold, TWRI, account 07-487095, M2202766

All other conditions and requirements of the MOA remain unchanged.

**Post Oak Savannah Groundwater
Conservation District**

Texas A&M AgriLife Extension Service

Ward Roddam, Board President

Lesli Kerth, Associate Director

Date: _____

Gary Westbrook, General Manager

Date: _____