

**Education of Best Management Practices in the Arroyo Colorado Watershed  
FY 05 CWA 319(h)  
TSSWCB Agreement No. 05-10**

Quarter no. 2 From 1/01/06 Through 3/31/06

**I. Abstract**

Extensive strides were made this quarter to coordinate this project with ongoing efforts throughout the Lower Rio Grande Valley in order to maximize the effectiveness of this project. Meetings were held to coordinate the project with the Agriculture Demonstration Initiative, Rio Grande Basin Initiative, Arroyo Agricultural Issues Work Group, Arroyo Colorado Watershed Steering Committee and Partnership, ongoing TCE demonstrations sites, and other TCE educational activities. Significant strides were also made by the education program. This quarter, 435 agricultural producers and residents from Cameron, Hidalgo, and Willacy Counties were provided training on crop production, nutrient management, integrated pest management (IPM), irrigation management, and conservation program through the Cotton Pre-Plant Seminar, three CEU Workshops, three Cameron Master Gardeners Meetings, and three EQIP Meetings. Additionally, a Texas Country Cleanup program provided 40 producers from Cameron, Willacy, and Hidalgo Counties the opportunity to recycle empty pesticide containers, used oil, oil filters, and batteries. This brings the total number of participants in project educational activities to 720.

**II. Overall Progress and Results by Task**

**TASK 1: Project Coordination**

*Subtask 1.1: Conduct quarterly meetings as appropriate with project participants (TWRI, TCE, TSSWCB, SWCDs, NRCS, Arroyo-Colorado Watershed Coordinator, TAMU Kingsville, etc.) to discuss project schedule, completion of deliverables, outreach and participation strategies, communication needs and other requirements.*

The following actions have been completed during this reporting period:

- a. TWRI and TCE met in Weslaco on January 20, 2006 to discuss project tasks, Extension educational program efforts, and reporting requirements for the project.

**15% Complete**

*Subtask 1.2: TWRI will submit project strategies / programs and project status as necessary to the Ag Issues Workgroup via TSSWCB for inclusion in the Watershed Protection Plan.*

The following actions have been completed during this reporting period:

- a. TCE provided a discussion of the project status to the Ag Issues Workgroup on February 22, 2006.

**20% Complete**

*Subtask 1.3: TWRI will prepare electronic quarterly reports and submit to TSSWCB*

The following actions have been completed during this reporting period:

- a. Submitted Year 1, Quarter 2 Progress Report to TSSWCB on April 12, 2006

**15% Complete**

*Subtask 1.4: TWRI and TCE will develop a final project report and submit to TSSWCB.*

**0% Complete**

## **TASK 2: Conducting Local Educational Meetings**

*Subtask 2.1: Meetings will serve to educate individuals on specific crop production techniques. Each of the following meetings will be held on an annual basis.*

- 2 cotton production meetings in Hidalgo, Cameron and Willacy Counties
- 1 sorghum production meeting in Hidalgo, Cameron and Willacy Counties
- 1 sugar cane production meeting in Hidalgo County
- 1 citrus production meeting in Hidalgo County
- 1 vegetable production meeting in Hidalgo County
- County / multi-county Pesticide Applicator Safety Training and Continuing Education

The following actions have been completed during this reporting period:

- a. On January 19, 2006, a Cotton Pre-Plant Seminar provided educational information to 125 cotton producers from Cameron, Hidalgo, and Willacy Counties on crop physiology, cotton varieties, nutrient management, integrated pest management (IPM), and irrigation management.
- b. CEU Workshops were held on January 25, February 22, and February 24 to train people in the safe use of crop protection chemicals. Topics included: the principles of integrated pest management, non-chemical alternatives, pest features, ground and surface water protection, laws and regulations, pesticide labels, endangered species protection, Worker Protection Standards, record keeping, personal protection, application equipment, calibration and continuing education units. This continuing education was provided to approximately 151 pesticide license holders from Cameron, Hidalgo and Willacy Counties.
- c. On February 14, 2006, a Texas Country Cleanup was held for producers in Cameron, Willacy, and Hidalgo Counties, giving them the opportunity to recycle empty pesticide containers, used oil, oil filters, and batteries. Approximately 40 producers participated.
- d. Cameron Master Gardeners met on March 10, 17, and 31. TCE provided training on (1) turfgrass management, including nutrient management and water conservation, to 8 participants on the 10<sup>th</sup>; (2) xeriscaping, including proper water and fertilizer use in the landscape, to 14 participants on the 17<sup>th</sup>; and (3) soils, including soil fertility, soil sample collection, soil types and other soil properties, to 12 participants on the 31<sup>st</sup>.

- e. On March 24, 2006, TCE participated in the Rio Grande Valley Cotton Advisory Committee Meeting and provided information on cotton residue management.

**15% Complete**

*Subtask 2.2: Meetings, demonstrations and other educational activities will serve to educate individuals on nutrient management techniques. Specifically:*

- *A soil testing campaign will be conducted within the 3 counties to promote proper use of fertilizers.*
- *When available, summarized data will be collected from TAMU-Kingsville and compiled into educational fact sheets or presented.*

The following actions have been completed during this reporting period:

- a. The Soil Testing Campaign in Cameron, Willacy, Hidalgo and Starr Counties continued through January 2006 to promote proper use of fertilizers. This free soil testing campaign is provided to producers to encourage the testing of soil and application of the testing results on their farms. This is a substantial economic benefit to and best management practice for producers participating in campaign.

**15% Complete**

*Subtask 2.3: Meetings and promotional events will serve to advertise and educate individuals on related programs addressing water quality. For example, TCE will:*

- *Promote cost-share programs (319(h), EQIP, etc.)*
- *Educate producers or assist SWCDs in development of water quality management plans*
- *Educate producers on involvement and development of the Watershed Protection Plan and the potential effects of its implementation.*

The following actions have been completed during this reporting period:

- a. TCE and TWRI participated in the *Meeting of the Arroyo Colorado Watershed Steering Committee and Partnership* held on January 19, 2006 in Weslaco.
- b. EQIP Meetings were held on February 7 and 8, 2006 in Hidalgo County to inform producers on how to apply for EQIP Program funds and provide producers information on nutrient management planning. A total of 60 producers participated in these meetings.
- c. An EQIP Meeting was held on February 9, 2006 in Cameron County, informing 25 producers on how to apply for EQIP Program funds and providing them information on nutrient management planning.
- d. Information was provided to producers in Willacy County on the EQIP application process through an EQIP Information Newsletter in January and February, 2006.
- e. The project is also being collaborated with the Rio Grande Basin Initiative (RGI) to provide landowners with accurate, technically sound information on improving irrigation methods and efficiency to reduce water use as well as the potential for nonpoint source pollution caused by improper use of land management techniques. A coordination meeting was held in Weslaco between TWRI and TCE on February 21, 2006.

- f. On March 9, 2006, a planning meeting was held to determine how Agricultural Demonstration Initiative (ADI) and TCE can work together cooperatively in the Lower Rio Grande Valley (including the Arroyo).
  1. A summary of the ADI Project Directives is attached.
  2. Besides the ADI sites, TCE will utilize three additional sites to collect data on and demonstrate proper irrigation water management:
    - Charles Loop farms (Brownsville, Cameron County) - 2 cropping sites  
Spring Sorghum 2006 (drip and furrow irrigation)  
Watermark sensors installed on the site to monitor soil moisture
    - Jimmy Steindinger Citrus Ranch (Donna, Hidalgo County) - 1 site  
Rio Red grapefruits (flood irrigation)  
Echo probes station installed to monitor soil moisture
    - Rio farms, Inc. (Monte Alto, Hidalgo County) - 2 cropping sites  
Rio Red grapefruits (flood irrigation)  
Watermark sensors installed on the sites to monitor soil moisture
- g. On March 27-30, 2006, Cooperative Extension Agents from Cameron and Hidalgo Counties participated in the Rio Grande Basin Initiative Conference in Ruidoso, New Mexico where they received professional improvement training on water quality and conservation. In addition, they gave a presentation on county Extension educational programs in the Valley, including the Arroyo Project.

**15% Complete**

### **III. Related Issues/Current Problems and Favorable of Unusual Developments**

- None

### **IV. Projected Work for Next Quarter**

- A quarterly meeting with TWRI and TCE is planned for April 27, 2006 to discuss the project schedule, completion of deliverables, outreach and participation strategies, communication needs and other requirements.
- On April 27, 2006, a meeting between TCE and TWRI will be held discuss the possibility of coordination the Arroyo BMP Education Project with the "Texas Stewards of Ag-land Resources: T-STAR" project.
- Participate in the Arroyo Steering Committee meeting scheduled for April 27, 2006.
- Work with the TSSWCB and other stakeholders in the Arroyo to finalize the Agricultural Component of the Watershed Protection Plan.

## Jan 2006 – ADI Project Directives

### **Agricultural Demonstration Initiative**

**Title:** Maximization of On-Farm Surface Water Use Efficiency by Integration of On-Farm Application and District Delivery Systems: On-Farm Demonstration Projects

**Project Director:** Shad D. Nelson, Texas A&M University-Kingsville  
Rammohan Uckoo and Heriberto Esquivel

**Co-PD:** Juan Enciso,; Texas A&M University, Weslaco, TX  
Xavier Peries

**Specific Aims:** The objective of this project is to demonstrate water conserving irrigation technologies in Lower Rio Grande Valley (LRGV) citrus, vegetable, and field crop production.

Actual Number of Field Sites: **13**  
Actual Number of Collaborators: **11**  
Actual Number of Cropping Sites: **21**

### **Field Sites under direction of Dr. Nelson, Ram Uckoo & Eddie Esquivel:**

- 1. Pawlik Farms: Jimmy Pawlik                      4 cropping sites**  
Rio Red (narrow borders), Rio Red (flood), Valencia (flood); Onion 2005 (Drip)  
Installed: 2 ECHO probe locations; Goal: install rain gauge
- 2. Valley Onions: Richard Treadaway      2 cropping sites**  
Fall Onions (Drip) & Celery (Furrow) 2005  
Goal: install ECHO probe soil moisture monitoring equipment & rain gauge
- 3. Juan Ramirez Farm                      3 cropping sites**  
Rio Red grapefruit, Blood Navel orange, Tangerine (all flood)  
Installed: ECHO probe in Rio Reds; rain gauge
- 4. Sam & Josh Ruiz                      1 cropping site**  
Fall Tomato 2005 (furrow)  
Goal: Install ECHO probes and rain gauge at next planting cycle
- 5. Bruce & Vicki Gamble      2 cropping sites**  
Fall corn 2005 (drip and furrow)  
Goal: Install ECHO probes and rain gauge at next planting cycle
- 6. South Farm, Citrus Center              1 cropping site**  
Rio Red Grapefruit, Irrigation evaluation (flood, drip, microjet spray)

**Field Sites under direction of Dr. Juan Enciso and Xavier Peries:**

**7. Duda Valley Onions (Edinburg, Cameron County) 2 cropping sites**

Fall Onions 2005 (West site and East site; Drip)

Installed: 2 WatchDog/WaterMark soil moisture systems and irrigation sensor

Goal: install rain gauge if needed

**8. Tetra Fruit & Vegetable (Rio Grande City, Starr County) 1 cropping site**

Fall Onions 2005 (Drip)

Installed: 2 WatchDog/WaterMark soil moisture systems, irrigation sensor and rain gauge supplied by TAMU

**9. Sweet-N-Tasty Citrus, Jim Hoffman (Edinburg, Cameron County) 3 cropping sites**

Rio Red (microjet) and Marrs grapefruit (drip), Valencia oranges (microjet)

Installed: 3 WatchDog/WaterMark soil moisture systems, irrigation sensors and rain gauge

**10. Julian Sauls Farm (La Feria, Cameron County) 1 cropping site**

Valencia oranges (drip)

Installed: WatchDog/WaterMark soil moisture systems from TAMU, and rain gauge

**11. Annex Farm, Texas A&M Univ. (Weslaco, Hidalgo County) 1 cropping site**

Fall Onions 2005 (drip for irrigation scheduling according ETP and soil moisture)

Installed: 3 ECHO soil moisture monitoring probe systems

**12. Shields Farms (Monte Alto, Hidalgo County) 1 cropping site**

Spring cotton 2006 (poly pipe furrow)

Installed: 1 ECHO soil moisture monitoring probe system

**13. Boone LaGrange (Rio Grande City, Starr County) 1 cropping site**

Spring 2006 musk melon honeydews (Drip)

Installed: WatchDog/WaterMark soil moisture system, and irrigation sensor

**Questions:**

1. How is the data being collected and how is it being stored?

Data from soil moisture sensing equipment and rain gauges at the afore-mentioned sites are being handled by Dr. Nelson's group (Ram Uckoo, Eddie Esquivel) and Dr. Enciso's staff (Xavier Peries) working on this project: and. Dr. Nelson's group handles 6 locations, while Dr. Enciso's group handles 7 locations. The data is collected in the field, stored temporarily on a laptop computer, then transferred to another computer at the research station/lab in Kingsville or Weslaco.

2. How will the data be made available to other growers?

Data downloaded will be delivered to Harlingen Irrigation District and Tom McLemore to make the data available on the ADI website, where soil moisture monitoring and rainfall data will be collected for growers to see.

ADI Collaborators will provide us with harvest, fertility, and input data respective to their ADI demonstration site. This information will be made available on the ADI website.

3. What are the ultimate goals of data collection?

We anticipate correlating water use from various irrigation systems with current irrigation practices used by growers. Initially soil moisture monitoring with evaluate where and to what depth water is moving within the soil profile. Also, correlate ET demand and crop water use (where in the rooting zone is water being taken), so that in the near future we can grasp better how much of the soil profile needs to be recharged during each irrigation cycle under drip, microjet, furrow, and flood irrigation practices. This work will be examined in relationship to soil type and location within the Lower Rio Grande Valley (LRGV)

4. What is the plan for 2006?

Graduate students are being trained in GIS programming to be able to dedicate these skills to our various sites across the LRGV demonstration sites.

Continue relationship with established collaborators and install purchased soil moisture monitoring equipment, rain gauges and most importantly focus on accurate water metering (supplying meters to collaborators, if needed).

Work more closely with Environmental Engineering group at TAMU-Kingsville and to apply “fuzzy logic” parameter to better estimate the proper time to irrigate and the amount growers should irrigate depending on what the soil moisture sensing equipment number is indicating.

Monitor soil quality parameters under low-water use irrigation systems over time. Such as, does soil salinity increase under drip or microjet irrigation vs. flood in the Valley, or do seasonal precipitation patterns dilute this so that it is not of a concern to growers?

Establish the baseline irrigation needs for growers involved in demonstration sites, and evaluate water and irrigation use efficiency from these locations.