Irrigation Programs
Research and Extension
by
Dr. Juan Enciso
Xavier Péries
Biological and Agricultural Engineering
Department
Extension and Research Center
Weslaco, TX.

Irrigation audits and workshops

Athletic Field Irrigation Audit Workshop

One-day short course on irrigation auditing or athletic fields
1.) How to estimate the water needs for your grass;
2.) How to set up a proper irrigation schedule to conserve water while maintaining quality turf grass;
3.) Management aspects of athletic fields.

Irrigation Management for Efficient Water Use.

The course will include practical information on measuring water delivery and soil water content, with hands-on demonstrations of measurement technology and techniques. The course is designed for anyone with an interest in irrigation management, including growers, consultants and government/state/district personnel.
Irrigation Management

8:30 a.m.
Introduction of Course
Understanding water usage with irrigation systems for crop production. (Juan Enciso)
Understanding soil properties. (Ian McCann)
Understanding soil water sensors (Juan Enciso/Ian McCann/Xavier Peries)
12:00 p.m. Lunch (provided by HIDCC at Calibration Facility)
12:30 p.m.
Soil water and flow estimations with hands-on demonstrations
4:00 p.m. Review and wrap up
4:30 p.m. Adjourn

Projects

- Agricultural Demonstration Initiative. Harlingen Irrigation District. TWDB
- Arroyo Colorado Agricultural Nonpoint Source Assessment-Best Management Practices. TSSWCB
- Rio Grande Basin Initiative
- Evaluation of drip Irrigation. Cotton Incorporated-TSSC.

TWDB-ADI (Ag. Water Cons. Demonstration Initiative)

Objectives:
1. Provide guidelines for irrigation scheduling to the farmer in order to conserve water and maximize IUE
2. Demonstrate and compare different irrigation technologies
3. Evaluate the sprinkler performance of some overhead systems

Soil moisture sensors on sugarcane allow the grower to delay his irrigation events as lower profile shows remaining available water. Potential water savings: 1 irrig./season (5 in./ac) or 17,000 ac-ft/year (for 40,000 ac. valley-wide)

Irrigation systems in the LRGV

- Drip 3%
- Sprinkler 2%
- Gated pipe 16%
- Poly-pipe 33%
- Earth ditches 33%

67% laser leveled
Main Crops in the LRGV

- Cotton: 26%
- Corn: 11%
- Sorghum: 7%
- Oats: 16%
- Peanuts: 12%
- Sunflower: 1%
- Sugarcane: 1%
- Vegetables: 1%
- Citrus: 0%

Depending on the sites, and of the irrigation event, surface runoff accounted for 4.5 to 66% of the water that was applied by irrigation.

Impact of Reducing Runoff

- Peak runoff running through the flume and drain-tiled flow (site FF)
- BMP's and Levels of irrigation technology
- Polypipe y water metering can reduce up to 20% water used

Irrigation Depth vs. Surface Runoff Recorded on Ap. Fields

BMP’s and Levels of irrigation technology
TWDB-ADI (Ag. Water Cons. Demonstration Initiative)

On citrus, soil moisture monitoring improved yields by 10 to 50% for the past 3 seasons and provided better understanding of soil response to drying/wetting cycles.

Potential water savings of 36,000 ac-ft per year could be reached when border flood was converted to MJ, or 20,500 ac-ft with drip (for 30,000 acres valley-wide).

TWDB-ADI (Ag. Water Cons. Demonstration Initiative)

The assessment of irrigation uniformity and irrigation depth on sprinkler systems is done to improve its management.

An audit performed on MESA pivots revealed a DU of 75%. When distribution problems along the ramps were repaired, efficiency was improved and 1.25 to 2.3 ac-ft per irrigation could be conserved on these pastures.

Pumping costs were estimated at $2.3 per ac-in. of water applied (with: 13' lift, 42 PSI, $0.15/Kwh). A comparison study with flood irrigation showed that 2.1 ac-ft per year could be conserved by using MESA pivot on that pasture.

Arroyo Colorado

Objectives:
1. Assessment of water quality and volumes from irrigation, runoff, drain tiles, and ground water
2. Evaluation of the impact of BMP’s to reduce pollution at the farm level within the watershed to create a simulation model
TSSWCB-Arroyo Colorado Task 7

- Surface runoff (EC<900ppm) ending into drain ditches accounted for 5 to 60% of the water that was applied by irrigation (EC av. 672ppm).

- Could runoff be re-used for irrigation during droughts on salt tolerant crops? Ground water EC varied from 1,200 to 1,800ppm and drain-tiled from 5,500 to 9,900ppm (outflow estimated at 5 to 7 ac-ft. post irrigation for a sugarcane field).

Evaluating Subsurface Drip Irrigation Systems
Cotton Incorporated

Objective: Document good management and maintenance practices to increase longevity of SDI systems

2008 – Irrigation evaluations

Evaluations of older Systems (>10 years)

Maintenance practices Were documented

Extension Publications

Irrigation Monitoring for Soil Water Sensors

Surface Irrigation