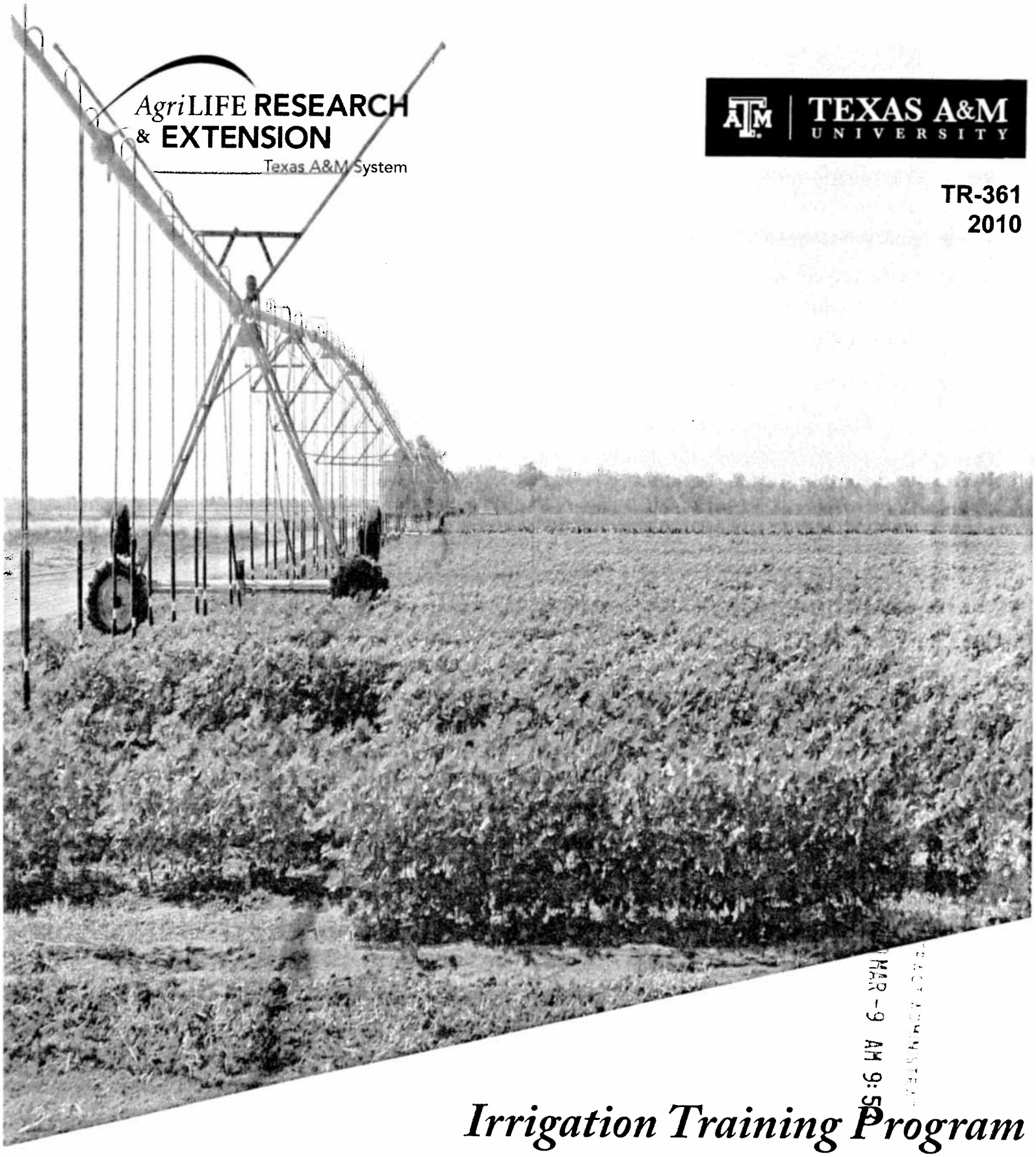
AgriLIFE RESEARCH & EXTENSION
Texas A&M System

TEXAS A&M UNIVERSITY

TR-361
2010



Irrigation Training Program
Final Report

Texas Water Resources Institute
make every drop count

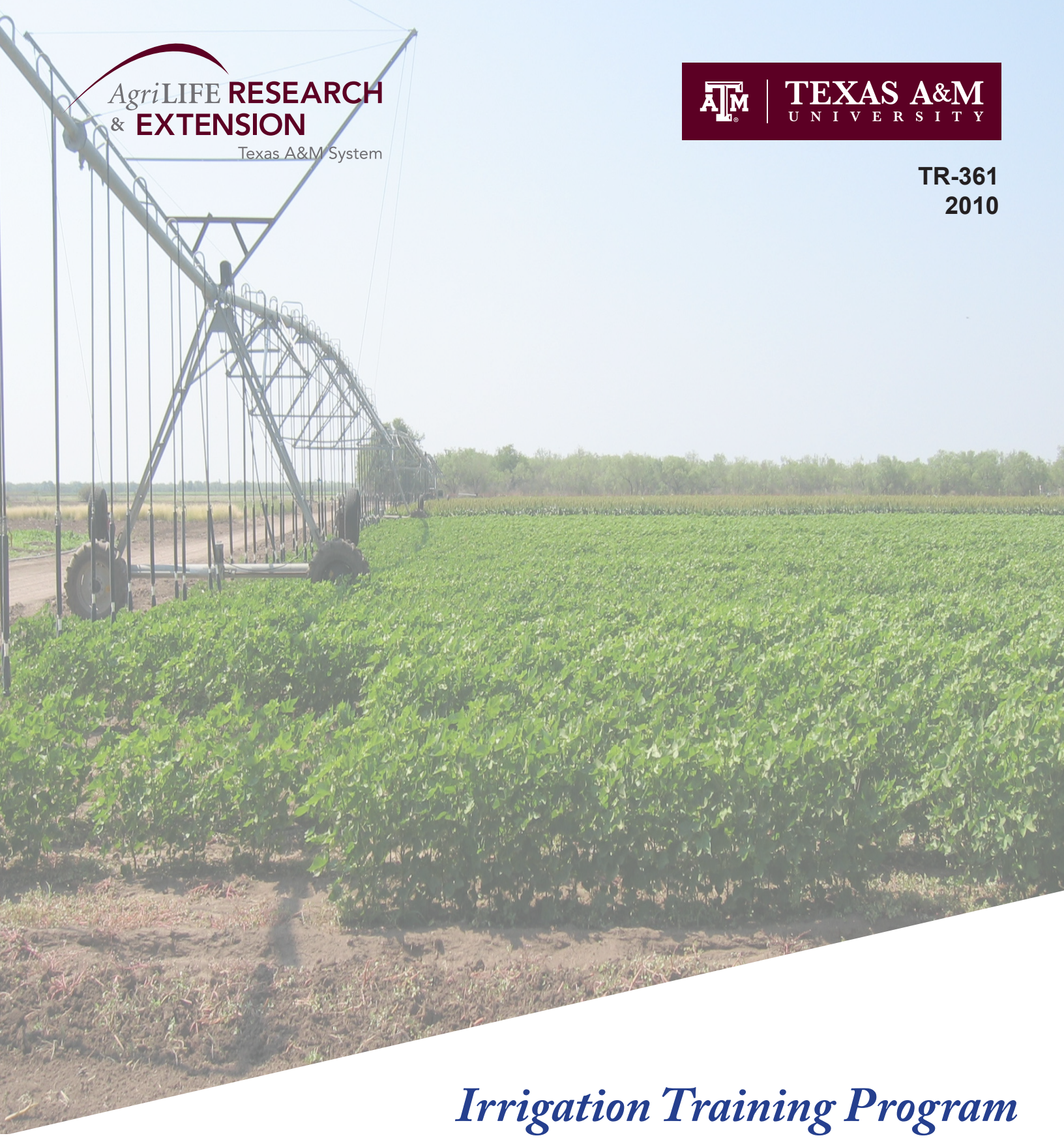
TSSWCB

TEXAS WATER DEVELOPMENT BOARD

AgriLIFE RESEARCH & EXTENSION
Texas A&M System

TEXAS A&M UNIVERSITY

TR-361
2010



Irrigation Training Program
Final Report

Texas Water Resources Institute
make every drop count

TSSWCB
Texas State Soil and Water Conservation Board

Texas Water Development Board

AgriLIFE RESEARCH & EXTENSION
Texas A&M System

TEXAS A&M UNIVERSITY

IRRIGATION TRAINING PROGRAM FOR TEXAS AGRICULTURAL PRODUCERS

Submitted by:
B. L. Harris, *Texas Water Resources Institute,* College Station, Texas

FINAL REPORT
February 2010

Texas Water Resources Institute Technical Report No. 361
Texas A&M University System
College Station, Texas 77843-2118

Funded by Texas Water Development Board, Project No. 0603580605
Managed by the Texas Water Resources Institute, College Station, Texas

Table of Contents

Table of Contents

List of Acronyms, Abbreviations & Definitions

AC-FT	Acre-Feet
AGRO	Agronomy
BEG	Bureau of Economic Geology
CEU	Continuing Education Unit
ECON	Economics
ENGR	Engineering
Extension	Texas AgriLife Extension Service
ITP	Irrigation Training Program
Research	Texas AgriLife Research
SDI	Subsurface Drip Irrigation
SWCD	Soil and Water Conservation District
TAIA	Texas Agricultural Irrigation Association
TCEQ	Texas Commission on Environmental Quality
TSSWCB	Texas State Soil and Water Conservation Board
TWDB	Texas Water Development Board
TWRI	Texas Water Resources Institute
USDA-ARS	U.S. Department of Agriculture – Agricultural Research Service
USDA-NRCS	United States Department of Agriculture–Natural Resources Conservation Service

List of Tables

Project Objectives

The Irrigation Training Program, funded by the Texas Water Development Board (TWDB) through an Agricultural Water Conservation Grant, began in 2006. Administered by the Texas Water Resources Institute (TWRI), the Texas State Soil and Water Conservation Board (TSSWCB), the local Soil and Water Conservation Districts (SWCDs), United States Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS), Texas AgriLife Extension Service (Extension) and Texas AgriLife Research (Research) worked together to build a multi-disciplinary Irrigation Training Program (ITP) that included development of a core manual and training conferences that were designed to meet regional needs.

The three year project was divided into four main tasks with separate objectives and deliverables. Under Task 1, the TSSWCB, SWCDs and USDA-NRCS supported the development and implementation of the Irrigation Training Program. Task 2 required TWRI, Extension and Research, in cooperation with the TSSWCB and USDA-NRCS to identify primary agency personnel to provide training and the key conference sites. To meet the objective of Task 3, TWRI, Extension and Research, in cooperation with the TSSWCB and USDA-NRCS developed the Irrigation Training Program manual and promoted irrigation training conferences. And finally, TWRI, Extension and Research, in cooperation with the TSSWCB and USDA-NRCS implemented the Irrigation Training Program through the delivery of six irrigation conferences to meet the task 4 goals.

Project Deliverables

During the first year of the project, Extension and TWRI developed a core fundamental outline of the manual and identified a team of researchers, scientists, and agency personnel who assisted in developing the ITP manual materials by guiding Extension and TWRI on the basic and specific topics needed in the manual.

Also during the first year of the project, Extension and TWRI in conjunction with the TSSWCB identified and involved key individuals to not only assist with the development of the ITP manual, but also possibly serve as trainers for the conferences. Extension and TWRI along with the TSSWCB, USDA-NRCS, the TWDB and others identified six conference locations in Texas, focusing largely on irrigated agricultural production areas.

Once a core outline was developed and personnel identified the six conference locations, TWRI and Extension incorporated detailed information into the manual following identified key regional issues developed from input gathered from various scientists and agency personnel. Using the developed fundamental and regional information, Extension drafted the ITP manual by compiling existing resources and developing new information where necessary. The TSSWCB worked with USDA-NRCS to provide materials for the manual along with AgriLife Research as well as other universities. The Irrigation Training Manual was published just in time for the first irrigation conference scheduled in 2008.

To develop the conferences, Extension and/or Research, depending on the location, worked locally with the TSSWCB, USDA-NRCS, SWCDs and leading agricultural producers to identify and develop conference agendas per the local or regional needs. Once the needs were identified, specific trainers were located for each conference and the trainers were asked to develop presentation material for the event. TWRI, Extension, the TSSWCB and USDA-NRCS worked to promote the conferences at the local level. Extension often led the conferences by arranging

logistics such as facility planning. Where necessary, however, the TSSWCB involved appropriate SWCDs or regional TSSWCB offices to host or co-host the events and identify facilities for the conferences.

Personnel delivered six ITP conferences throughout the state. The primary audience included agricultural producers, AgriLife County Extension Agents, SWCD personnel, crop consultants and other individuals who received information on improving irrigation management skills. Surveys were completed after each conference to evaluate the efficacy of the conference and build upon future programs to ensure optimum delivery of materials and information and to document "outcomes" such as behavior changes and water savings.

Project Outcomes and Impacts

The multi-agency, multi-discipline Irrigation Training Program created two separate editions of an inclusive 500-plus page ITP manual that addresses both fundamental information and region specific needs. The manual was also built so that it could easily be adapted to address new regional issues that change from year to year yet cover the broad scope of agricultural irrigation in Texas. Because the manual has regionally specific irrigation practices, cropping systems and climate, both the North and South Texas editions of the ITP manual are state-wide tools for transferring water conservation and related crop management technologies.

In addition to the two editions of the ITP manual, this project resulted in the successful completion of six irrigation conferences throughout the state. Each ITP conference included an evaluation instrument for participants to complete after the event to gauge knowledge gained and determine potential behavior changes as a result of the information presented at the conference. Through the six, region-specific training conferences, ITP was able to provide locally applicable irrigation water management training to irrigation farmers, consultants, educators and agency personnel in Texas while relying on the core and fundamental information provided in the ITP manual.

Overall, during the six conferences, Extension reached a total of 532 individuals. Based on the survey response rate and the question asking participants to select their occupation, Extension estimated the number of producers, crop consultants, agency personnel, etc. reached through the ITP conferences. Of the 532 attendees, Extension estimates that 296 of the attendees were agricultural producers, 18 were crop consultants, 37 represented AgriLife Extension, 118 of the participants were local, state or federal agency personnel including local districts such as groundwater or irrigation districts, 62 attendees were irrigation dealers and 52 chose 'other' as their occupation. It is important to note that some attendees indicated more than one occupation on their survey as they attended the conferences representing more than one occupation. For example, a local agency representative could have also attended as an agricultural producer.

In addition to participant occupation, Extension also asked attendees to provide the acreage they manage as well as the amount of irrigated acreage managed. The Lubbock conference survey did not include the specific question about irrigated acreage, but did inquire about overall acreage. Based on the six conferences, attendees manage an average of 2,365 acres and of that, 1,438 acres are irrigated. Using the estimate of total agricultural producers reached (296), the ITP conferences impacted approximately 700,000 acres with 425,600 acres of those being irrigated. TWRI estimates that the Irrigation Training Program saved a total of 93,848 AC-FT of water during the project.

Conclusions and Recommendations

The need for future conferences and a continued process to update the Irrigation Training Manual definitely exists as the agricultural industry is expected to reduce its consumption of irrigation water by 16 percent over the next fifty years (TWDB 2007). However, it is also important to consider what agricultural producers will attend and adopt. Factors such as timing of the conference, the length of the actual program and willingness of producers to adapt to new technologies and systems are important considerations when planning future events.

Therefore, Extension is encouraged to continue outreach activities, such as the irrigation conferences held during this program, using the existing or updated irrigation training manual. Cost-share programs to promote adoption of more efficient systems or upgrade existing older systems are needed from agencies such as the TSSWCB and USDA-NRCS. And a cooperative program between these three agencies assisting producers to take advantage of cost-share available and provide technical assistance to effectively use and maintain efficient systems is needed and recommended.

TWRI recommends additional funding for training conferences and related field demonstrations. The ability for agriculture to improve efficiency will take time and with each program, more producers will be reached and more producers will then adopt new and more efficient technologies.

Section One: Project Tasks, Deliverables, Timelines & Achievements

Background

In 2000, irrigation of agricultural land accounted for 60 percent of the total water used in Texas (TWDB 2007). Texans use more water for irrigation of agricultural crops than all other uses combined. The State Water Plan projects that the demand for irrigation water will decline to approximately 40 percent by 2060, while the population is expected to more than double in that time (TWDB 2007). More efficient irrigation systems, reduced groundwater supplies, and the transfer of water rights from agriculture to municipal uses account for the reduced irrigation demand. The Irrigation Training Program was designed to capitalize on the first item in that list as it strived to improve irrigation efficiency across Texas since its inception in 2006.

Efficient usage of irrigation water through the training of agricultural irrigators has the potential to yield large dividends in water savings. Therefore, in 2006, the Texas Water Development Board (TWDB) provided funding through an Agricultural Water Conservation Grant to the Texas Water Resources Institute (TWRI) who partnered with Texas State Soil and Water Conservation Board (TSSWCB), the local Soil and Water Conservation Districts (SWCDs), United Stated Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS), Texas AgriLife Extension Service (Extension) and Texas AgriLife Research (Research) to build a multi-disciplinary Irrigation Training Program (ITP) that included development of a core manual and training conferences that were designed to meet regional needs.

To effectively develop and implement the ITP, the project was broken down into four main tasks, which individually included separate deliverables, timelines and goals. The tasks, although separate, built a cohesive effort that culminated with the completion of two editions (North and South) of an ITP manual, an all-inclusive resource manual for irrigators, technicians, crop consultants and other professionals within the industry, and the completion of six training conferences held in primary agricultural regions of Texas.

Task 1

Objective: The TSSWCB, SWCDs and USDA-NRCS supported the development and implementation of the Irrigation Training Program.

Activities: The TSSWCB in conjunction with Extension and TWRI identified and involved key personnel to serve as trainers for ITP and assisted in the selection of the six conference locations in Texas. Where necessary, the TSSWCB involved appropriate SWCDs or regional TSSWCB offices to host or co-host the events, identify facilities for the training conferences and utilize the outreach of SWCDs to promote participation at the local level. In addition, the TSSWCB worked with USDA-NRCS to identify personnel to assist as trainers, provide materials for the manual and promote the conferences at the local level.

Achievements: Tables 1 and 2 outline Task 1 deliverables and achievements. In its subcontract with the TSSWCB, TWRI received support from the TSSWCB to identify trainers and the six conference locations. The TSSWCB helped local Extension personnel to reserve facilities, provide refreshments, handle reservations and arrange other necessary supportive functions such as a translator at the Rio Grande Valley Irrigation Conference and Trade Show. The TSSWCB also served as the liaison between TWRI and USDA-NRCS to identify trainers for the six conferences particularly related to presentations on cost-share programs.

While the TSSWCB served a supportive function, its fiscal role was minimal in this project. Therefore, the TSSWCB requested to dissolve their subcontract with TWRI and remain an active non-invoicing partner. Steps were taken during December 2008 to dissolve the subcontract and return the unspent funds to TWRI to support printing additional curricula for future conferences.

Table 1. Task 1 deliverable schedule

Task & Activity	Delivery Date
Task 1 – TSSWCB & SWCD Role in ITP	
Meet with NRCS to discuss EQIP & other incentive programs	9/06
Work with NRCS to develop specialized incentive programs where possible	ongoing
Identify key SWCD and NRCS personnel to assist in manual development	5/07
Identify key SWCD and NRCS personnel to assist with training delivery	8/07
Involve local SWCDs for each of the 6 selected training areas	5/07
Identify training location in each of the 6 training areas	8/07
Assist AgriLife in publicizing training events	1-2 mos prior to event

Table 2. Task 1 project achievements

Quarter Date	Achievement
9-15-06	• TWRI met with the TSSWCB, NRCS and the TWDB on August 25, 2006 to discuss agency roles.
12-15-06	• The TSSWCB participated in the contractual meeting with the TWDB, TWRI, Research and Extension on 10-19-06. • The TSSWCB worked with NRCS to review the draft timeline of deliverables and provided edits to TWRI for submission to the TWDB. • NRCS worked to identify key individuals to assist in manual development. Specifically, John Mueller and Cleon Namken will both be involved as well as others. Per suggestion by NRCS, the identification of key personnel to conduct trainings will occur after training locations are determined in order for local personnel to participate.
6-15-07	• The subcontract between TWRI and the TSSWCB was signed and approved. • The TSSWCB, NRCS, Extension and TWRI determined and finalized the selection of the six training locations (Amarillo, Lubbock (surrounding areas), Uvalde, Chillicothe, Mercedes, Sinton)
12-15-07	• The TSSWCB and NRCS participated in the October 31 meeting with TWRI, Extension and the TWDB. Both parties agreed to provide trainers where needed and the TSSWCB agreed to work with SWCDs at each training location to determine a site or facility for the training, if necessary. The first training site, Lubbock, was established at the time and the TSSWCB and the SWCDs were not needed to locate a facility, but for future sites, the TSSWCB and SWCDs were involved.
3-15-08	• NRCS attended and contributed to the ITP Manual and Lubbock conference. TWRI requested the assistance of the TSSWCB, SWCDs and NRCS for the upcoming Chillicothe conference.
6-15-08	• The TSSWCB worked with Extension to arrange a site for the Rio Grande Valley Irrigation Conference and Trade Show. The Rio Grande Valley Livestock Show in Mercedes was reserved.

9-15-08	• The TSSWCB arranged for five private sponsors to fund meal and refreshments for the Chillicothe conference, including:
	  ○ Goldenspread International Services, Inc., Memphis, TX
	  ○ Waggoner & Son Electric, Inc., Vernon, TX
	  ○ Kuehler Irrigation Company, Inc., Munday, TX
	  ○ Red River Authority, Wichita Falls, TX
	  ○ First Priority Irrigation, Wellington, TX
	• The TSSWCB arranged for NRCS and a TSSWCB representative to speak on behalf of cost-share programs at the Chillicothe conference.
	• The TSSWCB identified a speaker with NRCS for the Coastal Bend conference.

12-15-08	• The TSSWCB assisted AgriLife Extension to secure the location and facilities for the Rio Grande Valley Irrigation Conference and Trade Show (Mercedes). In addition, the TSSWCB agreed to compensate a translation service for the Mercedes conference so that participants from both US and Mexico could attend and understand. • The TSSWCB assisted AgriLife Extension to secure facilities for the Coastal Bend Irrigation Conference and Trade Show (Sinton). • The TSSWCB worked with AgriLife Extension to secure speakers representing NRCS for both the Sinton and Mercedes conferences. • The TSSWCB worked with AgriLife Extension to finalize a contract for the High Plains Irrigation Conference (Amarillo). The Amarillo Civic Center was booked for the event. • The TSSWCB discussed dissolving their subcontract with TWRI and given only 2 conferences remained where their services would be needed, TWRI agreed. Administration with both agencies took the necessary steps to dissolve the subcontract and the remaining funds were returned to TWRI. By the end of the quarter, papers were signed to make the transition official.

Task 2

Objective: TWRI, Extension and Research, in cooperation with the TSSWCB and USDA-NRCS identified primary agency personnel to provide training and identified the key conference sites.

Activities: Extension and TWRI in conjunction with the TSSWCB identified and involved individuals to serve as trainers for ITP. Extension and TWRI along with the TSSWCB, USDA-NRCS, the TWDB and others identified six conference locations in Texas, focusing largely on irrigated agricultural production areas. Extension and TWRI developed a core, fundamental outline of the manual and then incorporated detailed information into the manual following identification of key regional issues.

Achievements: Tables 3 and 4 outline Task 2 deliverables and achievements. Trainers selected represented a wide range of agency and industry personnel and included members from Extension, the TSSWCB, Research, the TWDB, USDA-NRCS, United States Department of Agriculture-Agriculture Research Service (USDA-ARS), Texas Tech University, Kansas State University, University of California-Davis, Groundwater Conservation Districts, Bureau of Economic Geology (BEG), Texas Railroad Commission, Texas Commission on Environmental Quality (TCEQ), Irrigation Districts and several private companies representing the irrigation industry.

The selection of the trainers and the sites allowed for the development of a complete manual and detailed conference agendas tailored to region-specific irrigation practices, cropping systems and climate. For example, TWRI and Extension determined fundamental information for the manual as a general outline and then expanded to include plant and environmental water use data; economics of systems, pumping and production; overview of various crop production systems; maintenance and operation of different irrigation systems; and water quality and pollution concerns.

Table 3. Task 2 deliverable schedule

Task & Activity	Delivery Date
Task 2 – Identify personnel to provide ITP Training	
Identify team of AgriLife personnel to develop manual	2/07
Identify key AgriLife personnel to assist with training delivery	2 mo prior to event
Identify 6 training areas across Texas	5/07
Draft schedule of trainings in 6 training areas	8/07
Develop outline of core engineering, agronomic and economic information	5/07
Develop outline of core agency program information (e.g. NRCS, SWCD, etc programs)	7/07
Develop outline of area specific information to be added to core manual	8/07

Table 4. Task 2 project achievements

Quarter Date	Achievement
9-15-06	• TWRI held a teleconference on 6-23-06 with Extension and Research to discuss individual roles and responsibilities in ITP development and delivery. Each Associate Department Head in the three key areas (ENGR, ECON, AGRO) identified individuals to participate in the ITP. • TWRI met with Jason Johnson at San Angelo Research and Extension Center on 6-29-06 to discuss role of economists in development of ITP manual and any materials previously developed. • TWRI met with Dana Porter at the Lubbock Research and Extension Center on 6-30-06 to discuss previous activities related to irrigation education and preliminary ITP development, manual outline, key participation/roles, and future planned irrigation education programs.
12-15-06	• Specialists were identified in all three disciplines (ENGR, AGRO, ECON) to work on the manual outline and develop components of the manual. • The draft manual outline was revised to include additions from project participants.
3-15-07	• Selected specialists reviewed the ITP manual outline. • Some of these specialists met on 1-10-07 in College Station in conjunction with the Agricultural Program Conference. Specialists reviewed ongoing irrigation education efforts across the state and identified topics for which there is overlap with other irrigation education activities. Since contributors were individually and collaboratively involved in a variety of irrigation education programs and writing efforts, the team focused on adapting materials from these efforts to meet goals of ITP. Contributors reviewed the manual outline and changed the format where needed.
6-15-07	• ENGR and AGRO Specialists participated in a teleconference on 5-17-07 to discuss timing of trainings, structure of trainings and topics within manual outline. • A conference draft agenda was developed. Following revision and review by specialists, the TSSWCB and NRCS, the draft agenda was submitted to the TWDB.
12-15-07	• The six conference locations (Amarillo, Lubbock (surrounding areas), Uvalde, Chillicothe, Mercedes, Sinton) were finalized and tentative dates for each location were determined. Possible meeting locations were discussed, but not finalized as input from local SWCDs in collaboration with Extension, the TSSWCB and NRCS is necessary. • The general outline for the manual and the supporting materials were submitted to the TWDB on 10-31-07. The TWDB provided comments to Extension during and in follow up to the meeting. The outline and supporting materials were used to develop a complete manual. • At the 10-31-07 meeting, site coordinators and trainers were identified for each location.
3-15-08	• The training schedule was distributed to area coordinators for final review.
6-15-08	• Training coordinators for each site were identified, including: o Southern High Plains (Lubbock) - Dana Porter and Mark Brown o Rolling Plains (Chillicothe) - Dana Porter and John Sij o Rio Grande Valley (Mercedes) - Guy Fipps, Juan Enciso and Brad Cowan o Coastal Bend (Sinton)– Jeffrey Stapper; Duane Campion and Charles Swanson o Northern High Plains (Amarillo) - Nich Kenny and Leon Church o South Texas (Hondo) – Jason Ott, Guy Fipps and Charles Swanson • Individual trainers for each location were discussed and identified. Specific trainers were identified based on individual needs for each local area.
9-15-08	• Coordinators and the TSSWCB prepared and arranged for speakers at each conference.
12-15-08	• Coordinators and the TSSWCB prepared and arranged for speakers at each conference.
3-15-09	• TWRI completed travel invoices for trainers and speakers from the six ITP conferences.

Task 3

Objective: TWRI, Extension and Research, in cooperation with the TSSWCB and USDA-NRCS developed the Irrigation Training Program manual and promoted irrigation training conferences.

Activities: Using the developed fundamental and regional information, Extension developed the ITP manual by compiling existing resources and developing new information where necessary. Extension also worked locally with the TSSWCB, USDA-NRCS, SWCDs and leading agricultural producers to identify and develop conference agendas per the local or regional needs. Once the needs were identified, specific trainers were located for each conference and the trainers were asked to develop presentation material for the event.

Achievements: Tables 5 and 6 outline Task 3 deliverables and achievements. Extension developed a core outline for the manual first and then, TWRI and Extension incorporated detailed information into the manual outline following identified key regional issues developed from input gathered from various scientists and agency personnel. Using the developed fundamental and regional information, Extension drafted the ITP manual by compiling existing resources and developing new information where necessary. The TSSWCB worked with USDA-NRCS to provide materials for the manual along with AgriLife Research as well as other universities.

The ITP manual contained information from the Irrigation Association Certified Agriculture Irrigation Specialist curriculum, the USDA-NRCS Irrigation Management Toolbox curriculum, the TWDB Best Management Practice materials, existing Research and Extension Fact Sheets, the TSSWCB and other cooperating agency data and all associated publications. In addition, the ITP manual and the irrigation conferences included information regarding EQIP or the TSSWCB sponsored cost-share and loan programs. The TSSWCB, USDA-NRCS, Research and the TWDB all reviewed the outline and the draft manual prior to its release. The Irrigation Training Manual was published just in time for the first irrigation conference scheduled in 2008. The manual was also made available on the Irrigation Training Program Web site, http://irrigationtraining.tamu.edu, so producers, agency personnel and agricultural professionals could access the information, organized by topic, on an as needed basis.

Table 5. Task 3 deliverable schedule

Task & Activity	Delivery Date
Task 3 – Develop ITP manual and promote ITP Training	
Draft core manual (including site specific information as available)	3/07 thru 6/07
Solicit review of manual by advisory group (AgriLife, SWCD, NRCS)	6/07 thru 7/07
Submit draft manual to TWDB for review and comment	7/07 thru 8/07
Finalize training manual for each site	9/07
Finalize schedule of trainings in 6 training areas	10/07
Identify key producers in each training area to encourage peer education	10/07
Publicize conferences	1-2 mos prior to event

Table 6. Task 3 project achievements

Quarter Date	Achievement
9-15-06	• Developed draft ITP manual outline. • Compiled a list of available irrigation Extension fact sheets; began converting some materials into electronic format; and identified some materials that need revision.
12-15-06	• Two fact sheets were developed to support Extension education and for the ITP Manual: o *BMPs to Prevent Pesticide Contamination of Water Resources,* a first edition was developed by Extension in cooperation with TCEQ and the Texas Groundwater Protection Committee. o *Irrigation Monitoring with Soil Water Sensors*, by Juan Enciso and Dana Porter. • ENGR faculty and staff (Dana Porter, Rachel Alexander and Bruce Lesikar) met on 11-14-06 to discuss ENGR components of ITP.
3-15-07	• ENGR specialists were asked to submit existing publications to begin drafting ITP manual.
6-15-07	• TWRI and ENGR Specialist, Dana Porter, revised manual outline to be more descriptive of detail and topics to be included. The manual was shared with AGRO specialist, Charles Stichler, and revised accordingly. • Porter revised outline to include links/references to publications that will be in the manual. • The draft manual outline was reviewed by specialists in ENGR, AGRO and ECON. • Additional materials were developed to fill identified gaps in the reference material.
9-15-07	• A set of materials to be used as references and within the manual were compiled and delivered to TWRI on 8-28-07. TWRI reviewed the materials to determine the best way to organize the information and worked with the TWDB to identify the desired manual/workbook format.
12-15-07	• The outline and supporting materials were provided to the TWDB at a 10-31-07 meeting. • Sample sections of the manual were provided to the TWDB after the meeting. Research and Extension also evaluated specific sections and provided comments to Dana Porter.
3-15-08	• Porter incorporated comments/suggestions; a complete manual was compiled for the Lubbock conference. This version lacked a few commodities that were not necessarily critical for the Lubbock area including citrus and vegetable crops. The TWDB requested TWRI to add these crops prior to the Uvalde and Mercedes conferences. • Sixty copies of the manual were printed for the Lubbock conference and all of them were distributed to the participants. Requests for additional copies were made further indicating the value of the material.
6-15-08	• An electronic version of the ITP Manual was submitted to TWRI during this quarter. • TWRI refined the ITP manual to create a more user-friendly format so that growers can easily access the vast amount of information and resources in the manual.
9-15-08	• The manual was revised to include a consistent format to improve readability and function. The final version, for North Texas conferences (Lubbock, Chillicothe and Amarillo) was released. • Over 60 copies of the manual were distributed at the Chillicothe conference. • Additional electronic copies were developed and distributed to NRCS and SWCD personnel.
12-15-08	• The manual developed for Lubbock and Chillicothe conferences was reviewed; it was decided to develop two editions of the manual – a South Texas and North Texas edition. While the core information is similar in both, the difference exists in addressing region specific information such as irrigation timing, crop production, irrigation systems and climate issues. Both editions were posted on the TWRI Web site. • Both editions were available electronically at the conferences and anytime from TWRI. A benefit of the electronic copies, besides economics, is that additional copies were and will be distributed to NRCS, AgriLife County Extension and SWCD offices/personnel at the conferences, which allows for a wider distribution of the manuals and provides an opportunity to reach producers who did not attend the training. • Printed South Texas edition for conferences in Mercedes (100 manuals) and Sinton (60 manuals).
3-15-09	• Printed South Texas edition for the Hondo (100 manuals) conference. • Printed North Texas edition for the Amarillo (100 manuals) conference.
6-15-09	• TWRI worked to establish an ITP Web site; ITP Manual, presentations from the conferences were posted on the site.

Task 4

Objective: TWRI, Extension and Research, in cooperation with the TSSWCB and USDA-NRCS implemented the Irrigation Training Program conferences.

Activities: Personnel delivered ITP conferences throughout the state. The primary audience included agricultural producers, but County Extension Agents, SWCD personnel, crop consultants and other individuals attended and received information on improving irrigation management skills. Surveys were completed after each conference to evaluate the efficacy of the conference and build upon future programs to ensure optimum delivery of knowledge and materials and to document "outcomes" such as behavior changes and water savings.

Achievements: Tables 7 and 8 outline Task 3 deliverables and achievements. Six individual conferences were held throughout the state between February 2008 and January 2009. Information presented at the conferences varied based on local needs. Available presentations from the conferences were made available on the Irrigation Training Program Web site, http://irrigationtraining.tamu.edu, so producers, agency personnel and agricultural professionals could access the information, organized by topic, on an as needed basis.
Attendees to the six conferences varied by occupation and included agricultural producers, crop consultants, irrigation and agricultural industry representatives, federal, state and local agency personnel including local groundwater or irrigation district managers and county Extension staff. Conference attendees were counted by occupation and agricultural producers were asked to provide estimates of acreage managed as well as irrigated acreage managed.

Surveys were also conducted at each conference to gauge the knowledge gained and assess behavior changes by participants. More information about survey results is available in Section 3. Overall, more than 90 percent of the participants found the information useful for their crop production practices and were impressed with the resources made available to them through the ITP manual.

In summary, the ITP conferences reached 532 participants, of which, an estimated 296 were agricultural producers. This more than meets the goal set forth in the beginning of the Irrigation Training Program to train at least 200 agricultural producers. And based on survey responses, attendees manage an average of 2,365 acres and of that 1,438 acres are irrigated. Using the estimate of total agricultural producers reached (296), the ITP conferences impacted approximately 700,000 acres with 425,600 acres of those being irrigated. Water saving projections are included in Section 4, but overall, TWRI estimates that the Irrigation Training Program saved a total of 93,848 AC-FT of water during the project.

Table 7. Task 4 deliverable schedule

Task & Activity	Delivery Date
Task 4 – Implement Irrigation Training Program	
Conduct ITP training programs	11/07 thru 3/09
Evaluate producer education & estimated water savings	11/07 thru 3/09
Summarize evaluation of program & estimated water savings for each training area	11/07 thru 3/09

Table 8. Task 4 project achievements

Quarter Date	Achievement
6-15-07	• A tentative schedule for each location (Amarillo, Lubbock (surrounding areas), Uvalde, Chillicothe, Mercedes, Sinton) was discussed as sites were identified.
12-15-07	• The first conference was scheduled for 2-1-08 in Lubbock, TX in conjunction with the Southwest Classic Farm Show.
3-15-08	• The first of six conferences was held on 2-1-08 in Lubbock, TX. A total of 43 participants attended the morning session, and approximately 35 to 38 participants attended the afternoon sessions. The afternoon session consisted of 2 sets of 2 breakout sessions – Applications of Center Pivot Technologies (18 attended) and Applications of Microirrigation Technologies (24 attended). Optimum Management of Forage and Grain Crops (12 attended) and Optimum Management of Cotton (25 attended).
6-15-08	• Training Dates for each site were revised as needed per the schedules of the training coordinators and trainers. o Chillicothe – August 19, 2008 o Mercedes – October 27-28, 2008 o Sinton – November 18, 2008 o Amarillo – January 14, 2009 o Uvalde – January 20, 2009 • Discussions to arrange the ITP conferences for Chillicothe, Sinton, Mercedes and Uvalde began. Each site's plans were led by site coordinators and a planning team that determined the date, agenda, location and specific trainers based on the area's needs. • A conference call to discuss the Chillicothe conference was held on 5-8-08. A draft agenda was developed during this discussion. • Discussions were held regarding the Mercedes conference. Project personnel reserved the Rio Grande Valley Livestock Show in Mercedes, Texas.
9-15-08	• The Chillicothe conference was held on 8-19-08. • A planning team meeting was held on 7-21-08 in Weslaco to plan the Mercedes conference. • A planning team meeting was held in Sinton on 7-25-08 to plan the Coastal Bend Conference. • Both the Valley and Coastal Bend conferences will be trade shows and training programs. Trade show announcements were sent out in September.
12-15-08	• The Mercedes conference was held on 10-29-08. • The Sinton conference was held on 11-18-08. • Planning efforts were underway for the Amarillo and Hondo conferences. Trade show announcements were sent out in November and September, respectively.
3-15-09	• The Amarillo conference and trade show was held on 1-14-09. • The Hondo conference and trade show was held 1-20-09. • All ITP conferences were held, including: o Southern High Plains (Lubbock) – February 1, 2008 with 43 participants o Rolling Plains (Chillicothe) – August 19, 2008 with 41 participants o Rio Grande Valley (Mercedes) – October 29, 2008 with 150 participants o Coastal Bend (Sinton) –November 18, 2008 with 37 participants o Northern High Plains (Amarillo) – January 14, 2009 with 133 attendees o South Texas (Hondo) – January 20, 2009 with 128 attendees
6-15-09	• TWRI developed a Web site, which features an interactive mode of the ITP Manual. • Additional manuals were printed.

Background

Given the large irrigated agricultural acreage and the need to improve irrigation efficiency to meet future water demands, the need for a cohesive Irrigation Training Program has been documented and discussed throughout Texas. Valuable resources and programs exist under the direction of Extension, Research, USDA-NRCS and the TSSWCB; however, a one-stop shop manual and program was not available. Recognizing that need, the TWDB provided funding to TWRI to work with multiple partners and develop the ITP manual.

When identifying its partners, TWRI took into consideration the diversity of Texas agriculture and Texas agricultural irrigation. TWRI worked with the TSSWCB, USDA-NRCS, Research and Extension to begin the process of developing an ITP manual given the TSSWCB has a network of 217 SWCDs often collocated with USDA-NRCS Field Offices, Extension has personnel in most of the 254 Texas counties, and Research has specialists at the regional and state levels. This partnership was uniquely structured to develop a program that meets local needs and yet covers the broad irrigation needs in the state. For example, each SWCD in the state is led by five elected directors engaged in farming or ranching and comprise an efficient statewide network that is keenly aware of local conservation needs. Similarly, Extension programs are prioritized by stakeholder groups at the county level. Based simply on structure, these organizations are designed to work and directly reflect the needs expressed at the local level. Therefore, when developing the ITP manual, it was a priority and a requirement that TWRI and Extension not only include the core information, but also cater the manual and conferences to local needs.

Manual Development

Initial review of available irrigation related information for Texas producers resulted in the finding of a variety of resources from Extension, Research, the TWDB, the TSSWCB, USDA-NRCS and other universities, such as Kansas State University. This was a positive benefit for the project as it clearly meant limited resources would need to be developed and rather, the manual could be built on existing, accurate resources to create one complete manual. Dr. Dana Porter, Associate Professor and Texas AgriLife Extension Agricultural Engineer Specialist, took the lead on compiling available resources and identifying data or information gaps in the resources to ensure a complete manual was delivered.

The first step involved identifying a core team (Table 9) of Research and Extension Specialists, USDA-ARS and USDA-NRCS professionals and scientists from water agencies to assist in the compilation of resources and documents related to irrigation economics (ECON), engineering (ENGR) and agronomics (AGRO).

Table 9. Core team of scientists who worked on the ITP manual.

Role	Individual
Team Leader	Dana Porter, Extension, ENGR (Lubbock)
Core Project Team	Juan Enciso, Extension, ENGR (Weslaco) Bruce Lesikar, Extension, ENGR (College Station) Nich Kenny, Extension, ENGR (Amarillo) Steve Amosson, Extension, ECON (Amarillo) Charles Stichler, Private, AGRO (Uvalde)
Technical Advisors/Reviewers	Paul Colaizzi, USDA-ARS, ENGR (Bushland) Thomas Marek, Research, ENGR (Amarillo/Etter) Terry Howell, USDA-ARS, ENGR (Bushland) Guy Fipps, Extension, ENGR (College Station) Aung Hla, TWDB, ENGR (Austin) Cleon Namken, NRCS, ENGR (Lubbock) Giovanni Piccinni, Research, AGRO (Uvalde) Brent Bean, Extension, AGRO (Amarillo) Jose Pena, Research, ECON (Uvalde) Luis Ribera, Research, ECON (Weslaco)
Training Program Coordinator	Courtney Swyden, TWRI (College Station)
Project Manager	Cecilia Wagner, TWRI (College Station)

Once a team was identified, an outline was developed to include the core engineering, agronomic and economic information necessary to create a complete manual. Several draft outlines were developed and reviewed by the team. With each review, topics were refined, amended and better organized to reflect the overall needs of the State. The final list of main topics in the manual includes:

- Economics
- Irrigation Scheduling
- Irrigation Technologies and Best Management Practices
- Water Quality Issues
- Crop-Specific Guidelines
- Additional Information/Resources

Personnel then worked to identify irrigation education resources from Extension, Research, the TWDB, the TSSWCB, USDA-NRCS and other universities, such as Kansas State University. These resources were compiled as a list within the outline and the various lead authors on each document were contacted to confirm use of their materials in the ITP manual. Individual authorship and credit were maintained as well as the individual look of each document. Appendix A contains the final manual outline approved by the core team and includes the initial list of resources compiled by topic. Additional resources were obtained as the manual was completed and the final list of resources is listed in the Irrigation Training Program manual itself.

The outline and resource list were then expanded to include the core information of the ITP manual. Based on each main section identified in the outline, Dr. Porter drafted an introduction, an overview or summary of core information and a 'test your knowledge' section within each topic. These sections were put together as the ITP manual and organized with the resource documents by topic.

The first edition of the ITP manual was developed and released at the Southern High Plains Irrigation Conference, the first of the six ITP conferences, held in Lubbock, TX on February 1, 2008. The manual was well-received as a thorough and complete resource manual for agricultural producers, crop consultants, irrigation industry professionals and agency personnel. Although 80 copies of the manual were made for the Lubbock conference, Extension received numerous requests for additional copies of the manual.

Despite the overwhelming interest, TWRI and Extension agreed the ITP manual needed to be improved regarding readability and accessibility to topics. Therefore, Courtney Swyden, TWRI Training Program Coordinator, took the original ITP manual files and refreshed the entire manual to create a user-friendly document with the same vital information and detail as presented at the Lubbock conference.

During the revision of the manual, Extension, Research, the TSSWCB, USDA-NRCS and the TWDB provided comments regarding the content and organization of the manual. For example, the TWDB requested information about production and irrigation of citrus and sugarcane (both crops produced primarily in South Texas) be added to the manual. Extension and Research pointed out that peanut production and irrigation information was only necessary for producers in North Texas. Therefore, after discussion and review, it was determined that two separate editions would be needed.

TWRI then worked to develop a North Texas and a South Texas edition to satisfy irrigation training needs in the state. Both editions are fairly similar in content and contain the core information. The difference between the two editions lies in the crops listed and in some of the resource materials provided throughout the manual. Appendix B provides electronic copies of the Irrigation Training Program Manual – North Texas edition and the Irrigation Training Program Manual – South Texas edition. Further, the manual was also made available on the Irrigation Training Program Web site, http://irrigationtraining.tamu.edu, so producers, agency personnel and agricultural professionals could access the information, organized by topic, on an as needed basis.

Because of the vast diversity of Texas agriculture, the final ITP manual included both fundamental information and region specific needs. Adapting the ITP manual locally allowed personnel to deliver innovative irrigation conservation and crop management technologies to a broad scope of agricultural producers in an effective manner. Further, by utilizing this unique manual tailored to regionally specific irrigation practices, cropping systems and climate, the ITP manual is a state-wide tool for transferring water conservation and related crop management technologies. Through planned, region-specific training conferences, the ITP was able to provide locally applicable irrigation water management training to irrigation farmers, consultants, educators and agency personnel in Texas while relying on the core and fundamental information provided in the ITP manual.

Looking Ahead: Assessing Future Need for ITP Manual and Conferences

When planning the six ITP conferences, several factors were taken into consideration. First, timing of an irrigation conference is imperative. Producers need a time when crop production is at a lull and field activity is minimal. Spring and summer should be avoided unless there is the opportunity to catch a brief break between two phases of production as Extension did with the Rolling Plains conference. Most producers can attend in late fall or late winter depending on their location in the state and therefore, these times tend to be more popular for producer education.

A second factor to consider is the amount of time for the individual program. While efforts are made to cover all of the topics needed, it is also important to realize that producers are not going to give more than a day or two of their time. When planning the ITP conferences, TWRI and Extension discussed this consideration with the TWDB. A multi-day event would have provided the option to cover more material, but it was determined that attendance would have been negatively impacted by a longer conference. Thus, a one-day event with a meal was the final program format decided upon and it was discussed that additional programs would be held in following years to cover the material not taught during the abbreviated session.

Finally, a third factor to consider is the willingness of the producers to attend and learn at such an event. It is often best to get buy-in from the leading producers in the area in order to get interest from other local producers. Extension followed this model when planning the six ITP conferences. Planning meetings that were held included prominent producers from each area that provided input on grower needs and the information that would bring the most benefit locally.

Therefore, considering these factors and the various needs and wants of Texas producers, it is difficult to develop a one-size fits all recommendation for future irrigation training needs in Texas. The need is definitely there as the agricultural industry is expected to reduce its consumption of irrigation water by 16 percent over the next fifty years (TWDB 2007). However, it is also important to consider what agricultural producers will attend and adopt.

When polling the ITP conference trainers, the general consensus was that a similar program that provided a broad handbook of

resources such as the ITP manual along with detailed and hands-on presentations addressing local issues was needed at least on a biennial (every other year) basis. For example, Dr. Juan Enciso, Associate Professor and Texas AgriLife Extension Specialist in Irrigation and Water Management, mentioned several programs are already offered on a more frequent basis where irrigation efficiency is one of the topics addressed and CEUs are provided to attendees. Dr. Enciso stated an event solely focusing on irrigation would be adequate at most, once per year. An Irrigation Expo is already being planned for October, 2010 in the Rio Grande Valley. This will happen almost exactly two years after the ITP conference held in Mercedes.

Producers overall were happy and pleasantly surprised by the quality and thoroughness of the ITP manual. Producers, crop consultants, industry representatives and agency personnel welcomed having the materials and resources all available in one simple location. The funding provided by the TWDB to develop the ITP manual was well-spent in that this manual can now serve future irrigation training programs in Texas. Extension has already discussed using it as a 'train the trainer' manual for professional development activities with its County Extension Agent staff. Further, the format of the manual provides specialists and agency personnel the option to simply update or take out dated-material. The organization also provides for the ability to focus training conferences on one specific topic if need be.

After three years of project activities, the development of two editions of an inclusive 500-plus page manual and six irrigation conferences across Texas, TWRI recommends additional funding for training conferences and related field demonstrations. The ability for agriculture to improve efficiency will take time and with each program, more producers will be reached and more producers will then adopt new and more efficient technologies. As stated by the TWDB Deputy Executive Administrator of Water Science and Conservation, Robert Mace, when asked about the need for future or additional trainings, "The more producers reached the better."

For example, subsurface drip irrigation (SDI) in the Rolling Plains area is not the prominent form of irrigation. Cost-share programs were introduced by USDA-NRCS and the TSSWCB in 2005 to encourage producers to shift to more efficient irrigation systems. Rather than upgrading from furrow irrigation to SDI, many producers chose to upgrade their center pivot systems or switch from furrow irrigation to center pivot. A couple of producers, however, have installed SDI systems in the area and have become advocates for the efficient water delivery system. One producer, according to local AgriLife Research Specialist John Sij, is already discussing expanding their SDI system to additional acreage due to the exceptional cost savings (water and power). It is producers like this serving as personal advocates coupled with additional training conferences that will eventually lead to increased adoption of more efficient irrigation systems.

The needs for USDA-NRCS and the TSSWCB to provide cost-share programs and for Extension to provide education related to the cost-share programs were also expressed by the ITP trainers. Cooperation among the agencies to promote adoption of more efficient systems, assist producers in taking advantage of the cost-share available and provide technical assistance to effectively use and maintain efficient systems is needed. A program facilitating this relationship and conferences focusing on these topics would be ideal for Texas.

Background

Both Extension and USDA-NRCS have a long history of providing education and technical assistance to producers in a one-on-one fashion where agriculturalists are able to gain hands-on training and information at the local level. It was the success of this type of program that led the Irrigation Training Program to more than development of a comprehensive ITP manual. In addition to the manual, this project also worked to create a network of six irrigation training conferences throughout the state to address agricultural producer's education and information needs.

ITP Conference Planning

The format of the training conferences was discussed in detail during project planning. It was noted that conferences would vary by site and the exact structure of the event would depend upon local interest and need. Generally speaking though, it was determined the conferences were to be one to two days in length with a similar basic curriculum and also include specialized information tailored to individual regions.

Initially, the six conference locations included Amarillo, Floydada, Southern High Plains, Rolling Plains, Uvalde and Lower Rio Grande Valley. After the project began and the TSSWCB, USDA-NRCS, Extension and TWRI were able to discuss location options, other areas were identified as potential sites. Following much discussion, it was determined the six ITP conferences would be located within the larger agricultural regions of Texas where irrigation production is predominant, including the Northern High Plains, Southern High Plains, Rolling Plains, South Texas, Coastal Bend and Rio Grande Valley. Availability of facilities and date dictated actual location within these regions and after the TSSWCB and Extension worked with local contacts, the six locations included Amarillo, Lubbock, Chillicothe, Hondo, Sinton and Mercedes, respectively. (Figure 1)

Each location was then catered to fit the local producer needs. In an effort to create a sustainable program, the conferences were incorporated into ongoing Extension, USDA-NRCS, the TSSWCB and industry events and programs, which boosted attendance and awareness of the event. In some areas, the ITP conference took the place of the annual irrigation program for that region.

To ensure local needs were met, many of the conferences were organized by a planning team, which included leading farmers in the area. County Extension Agents, Extension and Research Specialists, Agency representatives and local producers gathered in preparation for the training at Chillicothe, Sinton, Uvalde, and Mercedes. At each planning meeting, producers expressed topics of concern or areas of interest. These items were noted and then often included on conference agendas. Specialists or agency personnel with expertise in these areas were then identified to speak at the individual conferences.

Once the agenda was finalized, TWRI and Extension prepared flyers (Appendix C) and wrote news releases (Appendix D) to promote the conferences, drafted conference surveys to assess producer knowledge and acceptance of the event and worked with AgriLife Copy Services to print the ITP manual. Extension personnel familiar with previous irrigation events in the area provided estimates to TWRI regarding the number of manuals needed. Extension also worked to secure continuing education units (CEUs) for the attendees. Refreshments and other facilities were handled by the TSSWCB, Extension, or Research depending on the site. The Rio Grande Valley conference also required the facilitators (the TSSWCB and Extension) to plan for and secure a translating service as the conference was opened up to international participants.

Figure 1. Six regional irrigation conferences were held in Texas between February 2008 and January 2009.

ITP Conference Events

The six ITP conferences were held over one year and spanned from one tip of Texas to the other. The date, location and total attendees for each event are included in Table 10. Information presented at the conferences varied based on local needs. Available presentations from the conferences were made available on the Irrigation Training Program Web site, http://irrigationtraining.tamu.edu, so producers, agency personnel and agricultural professionals could access the information, organized by topic, on an as needed basis.

Table 10. Summary of ITP conference location, date and attendees.

Region	Location	Date	Participants
Southern High Plains	Lubbock	February 1, 2008	43
Rolling Plains	Chillicothe	August 19, 2008	41
Rio Grande Valley	Mercedes	October 29, 2008	150
Coastal Bend	Sinton	November 18, 2008	37
Northern High Plains	Amarillo	January 14, 2009	133
South Texas	Hondo	January 20, 2009	128

The Southern High Plains Conference (Lubbock) was held in conjunction with the Southwest Classic Farm Show. The Agenda for the training is included in Appendix E and topics focused on using subsurface drip and center pivot technologies. Speakers included members from the Texas Agricultural Irrigation Association (TAIA) and industry representatives. The Irrigation Association gave the Certified Irrigation Designer and Certified Agricultural Irrigation Specialist professionals as much as 6 CEUs for the Lubbock event (if attended the whole day). The Certified Crop Advisors received 4 CEUs for soil and water and 1 CEU for crop management.

The Rolling Plains Irrigation Conference (Chillicothe) was held on August 19, 2008 as a stand-alone event. The agenda, included in Appendix E, included an afternoon field day to a local producer's center pivot system and the Chillicothe Research Center's subsurface drip irrigation drip demonstration site. Unfortunately, rain kept participants out of the field and in place of the field trip, producers heard talks from leading industry representatives on both subsurface and pivot irrigation systems. To support refreshments and the meal, the TSSWCB and Research worked to get local sponsors for the conference. CEUs were provided to producers who signed up and attended the entire event.

The Rio Grande Valley Irrigation Conference and Trade Show (Mercedes), held on October 29, 2008, had a large participation group from both Texas and Mexico. The agenda (Appendix E) was even provided in both an English and Spanish version. Given the long history of irrigation events in the Valley, this conference was titled as the seventh annual irrigation conference and trade show and was the first of the six irrigation conferences to be both a trade show and educational conference. Producers learned about water conservation and managing their irrigation systems more efficiently. CEUs were provided to producers who signed up and attended the entire event.

The Coastal Bend Irrigation Conference and Trade Show, located in Sinton and held on November 18, 2008, also included a trade show for producers to view and experience leading-edge irrigation technology and systems. During the planning meeting for the Coastal Bend conference, producers expressed a concern regarding water quality and groundwater salt contamination from natural and man-made circumstances. Therefore, the conference included speakers from the Bureau of Economic Geology (BEG) and the Railroad Commission to address the gulf coast aquifer and oil brine contamination, respectively. Other topics on the conference agenda, included in Appendix E, dealt with irrigation system maintenance and using soil moisture devices for proper evapotranspiration (ET) management. Extension provided CEUs for producers who attended the Coastal Bend conference.

The Northern High Plains conference (High Plains Irrigation Conference and Trade Show) was held on January 14, 2009 at the Amarillo Civic Center. This conference, also promoted as both a trade show and educational meeting, focused on regional issues such as the state of the Ogallala Aquifer, the impact of dairies on water use and the water quality in the High Plains. Well-known speakers from multiple agencies and universities provided expertise on a variety of topics at the Amarillo conference (Appendix E). CEUs were provided to producers who signed up and attended the entire event.

The final irrigation conference, promoted as the South Texas Irrigation Conference and Trade Show, was held in Hondo, Texas, on January 20, 2009. Irrigation economics and crop water use as well as updates from several active irrigation agencies in the area were highlighted on the conference agenda (Appendix E). As with the other events, producers were able to obtain CEUs if needed.

While each conference contained a local spin, all of the events included applicable programs on crop water use, cost-share programs to enhance current irrigation systems, maintenance and operation of irrigation systems and economics of irrigation and production. Additionally, a local water agency, such as an irrigation district or a groundwater district, provided an update on local policies and issues at each conference. With these topics covered, each event provided a thorough program for producers to immediately gain pertinent, focused knowledge and take home additional detail in their ITP manuals.

ITP Conference Evaluation

Each ITP conference included an evaluation instrument for participants to complete after the event. While the evaluation instruments did vary by site, the materials were similar in scope in that each evaluation gauged knowledge gained in the topics presented at the conference.

Given the Lubbock conference was first, project personnel learned several lessons from the event and assessed impacts from it. First, based on the survey presented, Extension did not have a way to determine participant occupation and thus, did not have a way to quantify the number of agricultural producers reached. This was an imperative number to determine impacts so future surveys were revised to include a question about participant's primary occupation. Secondly, the Lubbock survey did not inquire about improving water use efficiency or water conservation. This question was also added to future surveys. And finally, a breakdown of total acreage compared to irrigated acreage was an additional question added to the future surveys.

The following provides a summary of evaluation results by conference location. Detailed summaries are included in Appendix F.

Overall, during the six conferences, Extension reached a total of 532 individuals. Based on the survey response rate and the question asking participants to select their occupation, Extension estimated the number of producers, crop consultants, agency personnel, etc. reached through the ITP conference. Of the 532 attendees, Extension estimates that 296 of the attendees were agricultural producers, 18 were crop consultants, 37 represented AgriLife Extension, 118 of the participants were local, state or federal agency personnel including local districts such as groundwater or irrigation districts, 62 attendees were irrigation dealers and 52 chose 'other' as their occupation. It is important to

note that some participants marked two occupations on their survey. For example, many agricultural producers have second jobs for an agency, as a crop consultant or irrigation dealer.

In addition to participant occupation, Extension also asked attendees to provide the acreage they manage as well as the amount of irrigated acreage managed. Again, the Lubbock conference survey did not include irrigated acreage, but did include overall acreage. Based on the six conferences, attendees manage an average of 2,365 acres and of that 1,438 acres are irrigated. Using the estimate of total agricultural producers reached (296), the ITP conferences impacted approximately 700,000 acres with 425,600 acres of those being irrigated.

Based on historical knowledge of participant survey response, it is fairly typical that agricultural producers do not complete surveys after events. Therefore, Extension assumes total acreage impacted was likely greater as well as total number of agricultural producers reached.

Southern High Plains Evaluation Results

For the Lubbock conference, a total of 43 participants attended the morning session, and 35 participants attended the afternoon session. As a result of the meeting, the participants responding to an evaluation (21% response) indicated that 100% of them considered the information useful for the upcoming 2008 crop year, and 100% indicated that they intended to implement changes in their irrigation practices based on the program. Participants indicated that they increased their knowledge of crop water requirements; soil moisture management; irrigation efficiency and economics; and information resources available. Finally, producers indicated intent to adopt various practices ranging from subsurface drip irrigation (66%) to conservation tillage (33%).

The survey conducted at the Lubbock conference did not include inquiry regarding occupation of participants. TWRI assessed total savings and total acreage affected assuming 50 percent of the attendees were agricultural producers (21 of the 43 attendees). Respondents indicated that the average acreage they managed was 2,468 acres. If this number was applied to all agricultural producers who participated in the conference, the total acreage managed by conference participants exceeded an estimated 51,828 acres.

Rolling Plains Evaluation Results

A total of 41 participants attended the conference located in Chillicothe, Texas. Based on the percentage of producers that completed the survey (12 out of 25), it is estimated that 19 of the 41 participants were agricultural producers. As a result of the meeting, the participants responding to an evaluation (61 percent response) indicated that 100 percent of them considered the information useful for the 2008 crop year. Participants indicated that they increased their knowledge of crop water requirements (31%); soil moisture management (60%); center pivot irrigation systems (38%); subsurface drip irrigation systems (74%); irrigation best management practices to improve water use efficiency (49%); and information resources available (56%). Respondents indicated that the average acreage they managed was 3,113 acres with an average 634 of those acres being irrigated. If this number was applied to all producers who participated, the total acreage managed by all conference participants exceeded an estimated 59,147 acres, of which an average 12,046 acres would be irrigated. Overall, 100 percent of respondents anticipate benefiting economically and increasing profitability as a direct result of what they learned from the conference. And, 100 percent of the respondents indicated an increase in water use efficiency and the ability to conserve water as a result of the ITP conference. Finally, producers indicated intent to adopt various practices ranging from subsurface drip irrigation (7%) to better irrigation scheduling (14%).

Rio Grande Valley Evaluation Results

A total of 150 participants attended the Rio Grande Valley Irrigation Conference and Trade Show. Based on the percentage of producers that completed the survey (37 out of 55), it is estimated that 100 of the 150 participants were agricultural producers. As a result of the meeting, the participants responding to an evaluation (37 percent response) indicated that 98 percent of them considered the information useful for the upcoming 2009 crop year. Participants indicated that the conference increased their knowledge of evapotranspiration (ET) (53%); soil moisture management and metering (59%); irrigation technology selection (60%); furrow irrigation systems (60%); fertigation (74%), recycling of agricultural plastics (86%), the current water supply situation (69%) and the irrigation information resources available (72%). Respondents indicated that the average acreage they managed was 937 acres with 761 of those acres being irrigated on average. If this number was applied to all producers who participated, the total acreage managed by all conference participants exceeded an estimated 93,740 acres, of which an average 76,050 acres would be irrigated. Overall, 52 percent of respondents plan to take actions or make changes based on conference information and 78 percent of respondents anticipate benefiting economically as a direct result of what they learned from the conference.

Coastal Bend Evaluation Results

The Coastal Bend Irrigation Conference and Trade Show was attended by 37 participants. Based on the percentage of producers that completed the survey (6 out of 13), it is estimated that 17 of the 37 participants were agricultural producers. As a result of the meeting, the participants responding to an evaluation (35 percent response) indicated that 91 percent of them considered the information useful for the upcoming 2009 crop year. Participants indicated that they increased their knowledge of current water supply (18%), soil moisture management and metering (43%); pumping plant efficiency (55%); flood and furrow irrigation systems (70%); center pivot irrigation systems (36%), salinity management (64%) and oil brine concerns (57%). Respondents indicated that the average acreage they managed was 917 acres with 135 of those acres being irrigated on average. If this number was applied to all producers who participated, the total acreage managed by all conference participants exceeded an estimated 15,589

acres, of which an average 2,295 acres would be irrigated. Overall, 50 percent of respondents plan to take actions or make changes based on conference information and 58 percent of respondents anticipate benefiting economically as a direct result of what they learned from the conference. Finally, 46 percent of the respondents indicated an increase in water use efficiency, while 54 percent were undecided.

Northern High Plains Evaluation Results

The High Plains Irrigation Conference and Trade Show, held in Amarillo, included a total of 133 participants. Based on the percentage of producers that completed the survey (20 out of 62), it is estimated that 43 of the 133 participants were agricultural producers. As a result of the meeting, the participants responding to an evaluation (47 percent response) indicated that 84 percent of them considered the information useful for the upcoming 2009 crop year. Participants indicated that they increased their knowledge of current and historic conditions of the Ogallala aquifer (79%); modeling methods in the Ogallala aquifer (74%), factors contributing to pumping plant efficiency (68%), maximizing profit by managing limited water (52%), remote sensing and automated irrigation systems (54%), soil moisture measuring devices and methods (51%), managing irrigation in virus effected crops (62%), and the impact of water use by dairies in the area (76%). Respondents indicated that the average acreage they managed was 4,603 acres with 4,146 of those acres being irrigated on average. If this number was applied to all producers who participated, the total acreage managed by all conference participants exceeded an estimated 197,929 acres, of which an average 178,278 acres would be irrigated. Overall, 46 percent of respondents plan to take actions or make changes based on conference information and 53 percent of respondents anticipate benefiting economically as a direct result of what they learned from the conference. Finally, 46 percent of the respondents indicated an increase in water use efficiency, while 34 percent were undecided.

South Texas Evaluation Results

A total of 128 participants attended the South Texas Irrigation Conference and Trade Show. Based on the percentage of producers that completed the survey (49 out of 65), it is estimated that 96 of the 128 participants were agricultural producers. As a result of the meeting, the participants responding to an evaluation (37 percent response) indicated that 85 percent of them considered the information useful for the upcoming 2009 crop year. Participants indicated that they increased their knowledge of crop water use and fertilizers (68%); benefits of irrigation technology (65%), pumping plant efficiency (70%), irrigation economics (60%), drip irrigation (59%), center pivot irrigation (64%) and current water issues (74%). Respondents indicated that the average acreage they managed was 2,153 acres with 488 of those acres being irrigated on average. If this number was applied to all producers who participated, the total acreage managed by all conference participants exceeded an estimated 206,688 acres, of which an average 46,848 acres would be irrigated. Overall, 56 percent of respondents plan to take actions or make changes based on conference information and 71 percent of respondents anticipate benefiting economically as a direct result of what they learned from the conference. Finally, 85 percent of the respondents indicated an increase in water use efficiency, while only 11 percent were undecided.

Background

TWRI is a unit of the two lead agencies in Texas that deal with agricultural research and education. Texas AgriLife Research, the state's premier research agency in agriculture, natural resources and life sciences, and Texas AgriLife Extension Service, an agency dedicated to improving the lives of people, businesses and communities across Texas and beyond through high-quality, relevant education, are parent organizations over TWRI and therefore, TWRI has a close working relationship with both agencies and its personnel. As the lead institute in Texas dealing with water quality and quantity issues, TWRI was able to administer the multi-disciplinary, statewide Irrigation Training Program.

Activities

As the administrator of ITP, TWRI handled administrative reporting and activities throughout the project (Table 11). In this role, TWRI maintained constant communication with the project partners (Research, Extension, the TSSWCB, and USDA-NRCS) and with the funding agency, the TWDB. TWRI also worked with the partners to schedule regular meetings to foster communication among project participants. TWRI facilitated annual contract meetings with the TWDB in the fall each year to discuss project activities and satisfaction with deliverables in progress. When necessary, TWRI communicated issues with the TWDB and rescheduled or refined deliverable dates to accommodate special circumstances. Quarterly reports were submitted in a timely fashion to the TWDB. Finally, TWRI allocated funds to project participants and administered a subcontract with the TSSWCB to ensure grant dollars were spent correctly and adequately.

Table 11. Administrative tasks and deliverables related to the ITP Project.

Quarter Date	Achievement
9-15-06	• Submitted year 1, quarter 1 progress report on 9-15-06.
12-15-06	• Submitted year 1, quarter 2 progress report on 12-15-06. • TWRI developed a draft timeline and circulated among project participants. • The TWDB reported that they were not receiving quarterly invoices for the ITP Project. After review, it was determined that the invoices needed to be broken down by task. To accomplish this effort, tasks were divided by the time period in which their activities will be conducted. This format was provided to AgriLife Contracts and Grants for their use to ensure future invoices will be delivered in a timely fashion. • TWRI held a contractual meeting on 10-19-06 with Extension, Research, the TSSWCB and the TWDB to discuss the TWDB expectations, project coordination and program delivery. • Extension held an internal discussion regarding execution of the work plan.
3-15-07	• Submitted year 1, quarter 3 progress report on 3-15-07.
6-15-07	• Submitted year 1, quarter 4 progress report on 6-15-07. • TWRI revised the timeline and provided it to the TWDB. • The subcontract between TWRI and the TSSWCB was signed and approved during this quarter.
9-15-07	• Submitted year 2, quarter 1 progress report on 9-15-07. • TWRI received comments from the TWDB on the draft timeline and finalized it.
12-15-07	• Submitted year 2, quarter 2 progress report on 12-15-07. • TWRI held a contractual meeting on 10-31-07 with Extension, Research, the TSSWCB and the TWDB to discuss the progress of the ITP Manual development. The general outline for the manual and supporting materials were submitted to the TWDB, who provided comments to Extension during and in follow up to the meeting.
3-15-08	• Submitted year 2, quarter 3 progress report on 3-15-08.
6-15-08	• Submitted year 2, quarter 4 progress report on 6-15-08.
9-15-08	• Submitted year 3, quarter 1 progress report on 9-15-08.
12-15-08	• Submitted year 3, quarter 2 progress report on 12-15-08. • TWRI held a contractual meeting on 10-17-08 with Extension, Research, the TSSWCB and the TWDB to discuss the progress of the ITP conferences. The TWDB provided comments regarding the agendas and participation in the conferences. The TWDB also suggested changes to the conference survey to assess participant occupation and irrigated acreage managed by participants. • The TSSWCB discussed dissolving their subcontract with TWRI and given only 2 conferences remained where services would be needed, TWRI agreed. Administration with both agencies took the necessary steps in to dissolve the subcontract and the remaining funds were returned to TWRI. By the end of the quarter, papers were signed to make the transition official.
3-15-09	• Submitted year 3, quarter 3 progress report on 3-15-09. • TWRI met with the TWDB on 2-11-09 to discuss final activities and additional tasks to include drafting a TWRI Web site that will include both editions of the manual and presentations from the conferences and TWRI will print additional hard copies and electronic copies of the manual. • TWRI worked with the TWDB to obtain a no-cost extension for the project to 11-30-09 and amend the scope of work per the additional tasks discussed on 2-11-09. • TWRI worked with the TWDB on a budget revision request following the meeting on 2-11-09.
6-15-09	• Submitted year 3, quarter 4 progress report on 6-15-09. • TWRI submitted a budget revision request to the TWDB on 6-2-09.
9-15-09	• Submitted draft final report in October 2009. • TWRI submitted a budget revision request to the TWDB on 9-23-09.

TWRI handled the printing and compilation of the ITP manuals for each location. Many hours went into compiling the over 500-page manual for each ITP conference (Table 12). In addition to the hard copies of the manuals, TWRI made and distributed additional electronic copies of the manual on CD. Each manual contained an electronic copy and additional electronic copies were sent to each conference to offer producers a preference. Work also went into developing and printing the agenda, flyers and surveys for each conference. TWRI drafted and/or provided background materials and contact information for several news releases (Appendix D) advertising and promoting the ITP conferences. This included contacting AgriLife Communications and contacting local Extension, the TSSWCB and USDA-NRCS offices who put up flyers announcing and promoting the conferences. Finally, TWRI arranged for all of the manuals, agendas, surveys, and CDs be delivered to each ITP conference across the state.

In concluding the project, TWRI created the Irrigation Training Program Web site, http://irrigationtraining.tamu.edu, which contains both editions of the ITP manual organized by topic and available presentations from the six irrigation conferences. Organization of the site makes it easy for producers, agency personnel and agricultural professionals to access the information by clicking through the various topics in the manual. The Web site was advertised on the irrigation listserv, Consortium of Irrigation Research and Education and the TWRI electronic newsletter, *New Waves*; was linked to existing Web sites such as the TWRI home page and the TWDB Agricultural Water Conservation home page; and was promoted via a news release drafted by TWRI. It is the intention of TWRI to provide this site for use by Extension, the TSSWCB, USDA-NRCS and other agencies for future trainings, add

materials as they need to be updated or revised and maintain its status to be a one-stop shop Web site for irrigation training needs.

Table 12. Number of ITP manuals and CDs printed for each ITP conference.

ITP Conference	Manuals Printed	CDs Printed
Southern High Plains	60	0
Rolling Plains	60	90
Rio Grande Valley	100	150
Coastal Bend	60	100
Northern High Plains	100	150
South Texas	100	150

Summary of Project Costs

Initial project expenditures were delayed due to the project activities not immediately starting. Delay in the set up of the subcontract and support accounts also led to a delay in expenditures and project activities. In fact, project invoices remained much the same until the second quarter in FY08. It was during this quarter that the first ITP conference was held in Lubbock and the first round of manuals were printed. After this started, project expenditures began to increase.

Billing by tasks and category was an arduous process especially considering the differences between nomenclature of categories for AgriLife Extension and the TWDB. Many of the invoicing discrepancies experienced throughout the project were simply due to the differences in category names between the two agencies. Numerous budget revisions took place towards the end of the project to account for the differences in category names and to account for errors in invoicing by task.

Further complicating the issue was the dissolution of the subcontract to the TSSWCB (Task 1) during the midst of the project. The TSSWCB intended to handle all facilities for the conferences. However, once the planning and organization began, project personnel realized it was much easier for the conference facilitators to handle this on their own and often times, this meant, Extension was handling the facilities instead of the TSSWCB. Recognizing this, the TSSWCB contacted TWRI and expressed a continued interest in being involved in ITP, but to ensure adequate use of funds, suggested that the subcontract be dissolved and those dollars go toward ITP conferences and manuals. While this step was a move to a more efficient use of funds, it did complicate the invoicing issue further as it completely removed task 1 from the invoicing, but this task remained in the project scope of work.

Tables 13 and 14 provide a summary of the project budget by task and category, respectively, including budgeted amounts, total expenditures and remaining funds as of the latest invoice (through November 30, 2009). TWRI intends to expend the majority of remaining funds (0.60 percent) on preparation and completion of the project final report through printing, personnel costs and submission to the TWDB, which will be invoiced on the final project invoice to be submitted through February 2010.
Total budget listed in both Tables 13 and 14 represents the project budget after budget transfers were made by the TWDB at the request of TWRI. Due to the dissolution of the subcontract, initial estimates of task budgets (as listed in the original proposal) were off for task 1. The excess funds originally budgeted for that task were expended within task 4, which required a budget shift of funds from task 1 to task 4. As Table 13 shows, a little over $6,000 was spent on task 1, including facilities and involvement of the TSSWCB and USDA-NRCS in the Irrigation Training Program. However, task 4 funds were also used on facilities, materials, speaker travel and related conference expenses. Therefore, task 1 and task 4 activities were very similar in scope.

The primary use of project funds paid personnel to facilitate and develop the ITP manual as well as put on the ITP conferences. Printing costs of the ITP manual were the secondary use of funds and with the release of the project Web site as well as CD copies, costs related to reproduction will likely be less for this type of project in the future. Minimal funds were expended on travel and technical support such as computer accessories (e.g. CDs), ITP manual supplies (e.g. notebook, dividers, labels) and ITP conference services (e.g. chair rental, translation services).

Table 13. Budgeted amounts, expenditures and funds remaining by task for the Irrigation Training Program.

	Total Budget	Total Expenses	Balance Remaining*
Task 1	$6,269.00	$6,269.50	-$0.50
Task 2	$40,000.00	$40,000.00	$0.00
Task 3	$90,923.00	$91,020.52	-$97.52
Task 4	$112,808.00	$111,208.67	$1,599.33
Total	$250,000.00	$248,498.69	$1,501.31

*Percent Remaining of the total funds is 0.60 percent.

Table 14. Budgeted amounts, expenditures and funds remaining by category for the Irrigation Training Program.

	Total Budget	Total Expenses	Balance Remaining*
Salaries & Wages	$143,061.88	$142,330.59	$731.29
Fringe	$31,710.32	$31,544.53	$165.79
Travel	$7,564.94	$7,564.94	$0.00
Reproduction	$51,052.73	$50,502.73	$550.00
Subcontractor	$0.00	$0.00	$0.00
Other Expenses	$16,610.13	$16,555.90	$54.23
Tech/Computer	$0.00	$0.00	$0.00
Total	$250,000.00	$248,498.69	$1,501.31

*Percent Remaining of the total funds is 0.60 percent.

Projected Water Savings

Actual irrigation water savings are variable as producers will likely adopt various practices and some may not adopt any at all as a result of the irrigation conferences. Obviously, the adoption of a new more efficient technology would lead to substantial water conservation, while producers' simply adopting better soil moisture management would result in some water savings, but not the level gained from the installation of a more efficient irrigation system. Climatic variation, cropping practices utilized, and soil types also affect the actual amount of water savings achieved by various practices. Therefore, the projected water savings from the Irrigation Training Program does not reflect actual water savings, but rather a sound estimate based on crop, irrigation system and conference location data, producer response to evaluation surveys and typical production practices.

Six irrigation conferences were held (Table 10) in conjunction with the Irrigation Training Program. Manuals were printed for all six conferences and extra electronic copies on CDs were also provided. At each conference, participants were asked to complete a survey quantifying their knowledge gained and their potential to increase water use efficiency as a result of the conference. It is these survey results from the six conferences that annual water saving estimates are based upon.

A total of 532 participants attended the six conferences. And of the 532 participants, Extension received a 43 percent response rate as 229 participants turned in a survey. Using this response rate and the number of agricultural producers that completed surveys, 296 of the 532 participants were agricultural producers. The average land managed by producers who attended was 2,365 acres with 1,438 of that being irrigated acreage. The six ITP conferences impacted over 700,000 acres of which 425,600 acres were irrigated in Texas.

Southern High Plains: A total of 43 participants attended the morning session, and 35 participants attended the afternoon session. As a result of the meeting, the participants responding to an evaluation (21% response) indicated that 100 percent of them considered the information useful for the upcoming 2008 crop year, and 100 percent indicated that they intended to implement changes in their irrigation practices based on the program. Participants indicated that they increased their knowledge of crop water requirements; soil moisture management; irrigation efficiency and economics; and information resources available. Given these practices were discussed as well as improvements in center pivot and subsurface irrigation and participants responded an increase in knowledge in these areas, the percent efficiency gained at the Southern High Plains conference was 20 percent.

The survey conducted at the Lubbock conference did not include inquiry regarding occupation of participants. TWRI assessed total savings and total acreage affected assuming 50 percent of the attendees were agricultural producers (21 of the 43 attendees). Respondents indicated that the average acreage they managed was 2,468 acres. If this number was applied to all participants, the total acreage managed by all conference participants exceeded an estimated 51,828 acres. According to Texas AgriLife Extension Program Specialist, Nich Kenny, the South Plains

cotton producer uses approximately 10 inches of water per acre (0.83 AC-FT) annually, which equates to 43,190 AC-FT applied on all of the acreage impacted by the ITP conference. Based on a 20 percent efficiency gain, this will result in a savings of 8,638 AC-FT annually.

Rolling Plains: At the Rolling Plains conference in Chillicothe, 41 participants attended the event and we estimate 19 of the 41 participants were agricultural producers. According to the survey, 100 percent of the respondents indicated an increase in water use efficiency and the ability to conserve water as a result of the ITP conference. Additionally, 100 percent of respondents anticipate benefiting economically and increasing profitability as a direct result of what they learned from the conference. In reviewing the practices (subsurface drip irrigation, irrigation scheduling, center-pivot irrigation) discussed at the conference and the survey results, we conservatively estimate a 20 percent gain in water use efficiency. According to the respondents, the average acreage irrigated by producers was 634 and given 19 participants were agricultural producers, total irrigated acreage reached at the Rolling Plains conference was 12,046. According to Dr. John Sij, Professor with Texas AgriLife Research, the average cotton producer uses 14 inches of water per acre (1.17 AC-FT) annually, which equates to 14,054 AC-FT applied on all of the acreage impacted by the ITP conference. Based on a 20 percent efficiency gain, this will result in a savings of 2,811 AC-FT annually.

Rio Grande Valley: A total of 150 participants attended the Rio Grande Valley conference and it is estimated that 100 of the 150 participants were agricultural producers. Based on survey responses, 78 percent anticipate benefitting economically as a direct result of the ITP conference. Further, 52 percent of the respondents plan to take actions or make changes based on the conference. In reviewing the practices (furrow irrigation improvement, soil moisture management, ET) discussed at the conference and the survey results, we conservatively estimate a 15 percent gain in water use efficiency. According to the respondents, the average acreage irrigated by producers was 761 and given 100 participants were agricultural producers, total irrigated acreage reached at the Rio Grande conference was 76,050. In communication with Dr. Juan Enciso, Associate Professor and Texas AgriLife Extension Specialist in Irrigation and Water Management, TWRI quantified water use for both cotton and grain sorghum producers as these are equally predominant crops produced in the Rio Grande Valley. Enciso estimated the average cotton producer uses 25 inches of water per acre (2.08 AC-FT) annually, which equates to 79,219 AC-FT. Based on a 15 percent efficiency gain, this will result in a savings of 11,883 AC-FT annually. Enciso further estimated the average sorghum producer uses 15 inches of water per acre (1.25 AC-FT) annually, which equates to 47,531 AC-FT. Based on a 15 percent efficiency gain, this will result in a savings of 7,130 AC-FT annually.

Coastal Bend: At the Coastal Bend (Sinton) conference, 17 of the 37 participants were agricultural producers, and 46 percent of the participants said they would increase their water use efficiency using information presented at the ITP conference. Further, 50 percent of the respondents plan to take actions or make changes based on the conference. In reviewing the practices (center pivot irrigation, furrow irrigation improvement) discussed at the conference and the survey results, we conservatively estimate a 20 percent gain in water use efficiency. According to the respondents, the average acreage irrigated by producers was 135 and given 17 participants were agricultural producers, total irrigated acreage reached at the Coastal Bend conference was 2,295. Duane Campion, AgriLife County Extension Agent for San Patricio County, stated the average cotton producer uses 8 inches of water per acre (0.67 AC-FT) annually, which equates to 1,530 AC-FT applied on all of the acreage impacted by the ITP conference. Based on a 20 percent efficiency gain, this will result in a savings of 306 AC-FT annually.

Northern High Plains: A total of 133 participants attended the Northern High Plains conference and it is estimated that 43 of the 133 participants were agricultural producers. Based on responses, 46 percent of the participants said they would increase their water use efficiency using information presented at the ITP conference and the same percent of respondents plan to take actions or make changes based on the conference. In reviewing the practices (soil moisture measurement, automated irrigation systems) discussed at the conference and the survey results, we conservatively estimate a 15 percent gain in water use efficiency. According to the respondents, the average acreage irrigated by producers was 4,146 and given 43 participants were agricultural producers, total irrigated acreage reached at the Northern High Plains conference was 178,278. According to Texas AgriLife Extension Program Specialist, Nich Kenny, the average corn producer uses 22 inches of water per acre (1.83 AC-FT) annually, which equates to 326,843 AC-FT applied on all of the acreage impacted by the ITP conference. Based on a 15 percent efficiency gain, this will result in a savings of 49,026 AC-FT annually.

South Texas: The South Texas conference had 128 participants and of that 96 were agricultural producers. Based on responses, 85 percent of the participants said they would increase their water use efficiency using information presented at the ITP conference and 56 percent of respondents plan to take actions or make changes based on the conference. In reviewing the practices (subsurface drip irrigation, center pivot irrigation) discussed at the conference and the survey results, we conservatively estimate a 20 percent gain in water use efficiency. According to the respondents, the average acreage irrigated by producers was 488 and given 96 participants were agricultural producers, total irrigated acreage reached at the South Texas conference was 46,848. TWRI communicated with the Texas AgriLife Extension Service Medina County Extension Agent, Jason Ott, to assess the water use and predominant crop for the South Texas region. Ott estimates the average corn producer uses 18 inches of water per acre (1.5 AC-FT), which equates to 70,272 AC-FT applied on all of the acreage impacted by the ITP conference. Based on a 20 percent efficiency gain, this will result in a savings of 14,054 AC-FT annually.

Using each of the conference sites as a sound estimate of water savings, total water savings of the Irrigation Training Program is 93,848 AC-FT. Table 15 provides an overview of each conference site and total irrigation water saved as a result of the Irrigation Training Program.

Table 15. Annual water application and savings for the predominant crop(s) for reach region where an Irrigation Training Program conference was held.

	Crop	AC-FT Applied	Total Acres	AC-FT applied	Percent Efficiency	AC-FT Savings
Southern High Plains	Cotton	0.83	51,828	43,190	20%	8,638
Rolling Plains	Cotton	1.17	12,046	14,054	20%	2,811
Rio Grande Valley	Cotton	2.08	38,025	79,219	15%	11,883
	Sorghum	1.25	38,025	47,531	15%	7,130
Coastal Bend	Cotton	0.67	2,295	1,530	20%	306
Northern High Plains	Corn	1.83	178,278	326,843	15%	49,026
South Texas	Corn	1.50	46,848	70,272	20%	14,054
Total						**93,848**

Conclusion and Recommendations

In review of the process followed to develop the inclusive Irrigation Training Manual and the site-specific irrigation conferences, TWRI notes a level of success and achievement to accomplish this state-wide effort including six large irrigation conferences and two separate editions of an inclusive 500-plus page manual. With such a large project that included numerous faculty, agencies and disciplines, the use of an external project administrator, such as TWRI, benefited the project team and achievements. TWRI served as the liaison between the TWDB and the scientists for all tasks related to this program. TWRI's role allowed the project researchers and scientists the ability to focus on specific tasks and project deliverables while maintaining communication and cooperation with other members of the project team and the TWDB. Additionally, multiple agencies and scientists from various disciplines were able to provide their input, expertise and professional guidance to a single program that benefited agricultural producers statewide.

The need for future conferences and a continued process to update the Irrigation Training Program manual definitely exists as the agricultural industry is expected to reduce its consumption of irrigation water by 16 percent over the next fifty years (TWDB 2007). However, it is also important to consider what agricultural producers will attend and adopt. Factors such as timing of the conference, the length of the actual program and willingness of producers to adapt to new technologies and systems are important considerations when planning future events. When polling the ITP conference trainers, the general consensus was that a similar program that provided a broad handbook of resources such as the ITP manual along with detailed and hands-on presentations addressing local issues was needed at least on a biennial (every other year) basis.

An existing benefit is that AgriLife Extension, USDA-NRCS, the TSSWCB and AgriLife Research already provide outreach and education activities, technical assistance, cost-share programs and the latest information gained through innovative research studies to agricultural producers in Texas. The Irrigation Training Program simply compiled much of this information into a one-stop shop manual and Web site and created venues for producers to gain additional local in-sight.

Therefore, Extension is encouraged to continue outreach activities, such as the irrigation conferences held during this program, using the existing or updated irrigation training manual. Cost-share programs to promote adoption of more efficient systems or upgrade existing older systems are needed from agencies such as the TSSWCB and USDA-NRCS. And a cooperative program between these three agencies assisting producers to take advantage of cost-share available and provide technical assistance to effectively use and maintain efficient systems is needed and recommended.

TWRI recommends additional funding for training conferences and related field demonstrations. The ability for agriculture to improve efficiency will take time and with each program, more producers will be reached and more producers will then adopt new and more efficient technologies. As stated by the TWDB Deputy Executive Administrator of Water Science and Conservation, Robert Mace, when asked about the need for future or additional trainings, "The more producers reached the better."

Acknowledgments

The Texas Water Resources Institute (TWRI) prepared this report with input and information from the Texas AgriLife Extension Service (Extension), Texas AgriLife Research (Research), Texas State Soil and Water Conservation Board (TSSWCB) and United Stated Department of Agriculture-Natural Resource Conservation Service (USDA-NRCS). Cecilia Wagner, TWRI Project Manager, served as the primary author, and expresses her gratitude to Danielle Supercinski, TWRI Project Manager, who provided much-needed expertise and guidance during the development and completion of this report.

Many other TWRI staff members contributed to the success of this project. We acknowledge Courtney Swyden, TWRI Training Program Coordinator, who spent endless hours formatting and designing the Irrigation Training Program manual. Her dedication led to the development of a well-organized and easy-to-use manual for Texas irrigators. Thank you to Sarah Seidel, TWRI Business Coordinator, who worked endlessly on budget revisions, invoicing by task, reimbursements of speakers and project related purchases to ensure fiscal requirements were followed and met. We also appreciate Jaclyn Tech, TWRI Software Applications Developer, who created and maintains the Irrigation Training Program Web site, and Kathy Wythe, TWRI Communications Coordinator, who assisted with the formatting of the final project report and overall, made this report look good. Finally, the administration at TWRI, Dr. Bill Harris and Mr. Kevin Wagner, provided the leadership and guidance needed to ensure a successful Irrigation Training Program was developed for Texas.

Dr. Dana Porter, Associate Professor and Texas AgriLife Extension Agricultural Engineer Specialist, contributed many hours to compiling and organizing the resources for the Irrigation Training Program (ITP) Manual. She also took time to summarize core topics and created a 'test your knowledge' section to enhance the producers' use of the manual. Her effort and dedication was the success behind this program. Dr. Porter served as the primary contact for all of the Research and Extension personnel and attended annual meetings with TWRI and the TWDB to maintain communication.

Of course, Dr. Porter relied on the expertise and input from many colleagues, which contributed to the ITP manual as individual or supporting authors to one or more of the many excellent resource documents listed. Contributing authors for the ITP manual include Archie Abrameit, Mahbub Alam, Lal Almas, Steve Amosson, David Bade, Todd Baughman, Paul Baumann, Brent Bean, Mark Black, Randy Boman, Jim Bordvosky, Fran Bretz, Josh Bynum, Edsel Bynum, Paul Calaizzo, Tom Cothren, Gregory Cronholm, Clyde Crumley, Frank Dainello, Steven Davis, Peter Dotray, Juan Enciso, Guy Fipps, James Grichar, Aung Hla, Terry Howell, Thomas Isikiet, John Jackman, Freddie Lamm, Thomas Lee, Robert Lemon, Steve Livingston, Thomas Marek, Mark McFarland, Travis Miller, Leon New, Gale Norman, Carl Patrick, Xavier Peries, Giovanni Piccinni, Dana Porter, Patrick Porter, Danny Rogers, Scott Russell, Christopher Sansone, Steve Santistevan, Greta Schuster, William Sothers, Douglass Stevenson, Charles Stichler, Calvin Trostle, Noel Troxclair, Billy Warrick, the TWDB and USDA-NRCS.

TWRI also appreciates the dedication and input from the ITP conference facilitators. The Southern High Plains conference was put on by Dr. Dana Porter and Mark Brown, both with Extension. Dr. John Sij (Research), Judy Albus (TSSWCB), Brad Easterling, Steven Sparkman and Dr. Dana Porter (Extension) put together the Rolling Plains conference. For the Rio Grande Valley conference, Dr. Guy Fipps, Charles Swanson, Brad Cowan and Dr. Juan Enciso (Extension) worked together. And Charles Swanson, Duane Campion and Jeff Stapper (Extension) organized the Coastal Bend conference. The Northern High Plains conference was facilitated by Nich Kenny

(Extension). And the final conference, the South Texas conference, was organized by Dr. Guy Fipps, Charles Swanson and Jason Ott (Extension).

Finally, and most importantly, TWRI thanks the TWDB Agricultural Water Conservation Section for their support of this important outreach and education project. Thank you to Whitney Milberger-Laird, TWDB project officer, who provided an understanding and cooperative ear throughout this project. Her support and willingness to help created an enjoyable and successful project relationship. Thank you also to the other members of Agricultural Water Conservation Division as they provided assistance and support when needed. Current members of the group are Comer Tuck (Director), Aung Hla (Team Lead) Mark Michon and Cameron Turner. Finally, without the financial support from the TWDB, this project could not have happened.

References

Texas Water Development Board. January 2007. Water for Texas 2007. Document No. GP-8-1.

Appendices

Irrigation Training Program Manual Outline and Resource List

Economic Issues in Irrigation

Economics of Irrigation Systems. Texas Cooperative Extension Fact Sheet Fact Sheet B-6050.
[Amosson, Stephen H., Leon New , Lal Almas , Fran Bretz and Thomas Marek. 2002. Economics of Irrigation Systems. Texas Cooperative Extension Fact Sheet Fact Sheet B-6050. Texas Cooperative Extension Fact Sheet B-6113. Texas A&M University System, College Station, TX. 20 pp. http://tcebookstore.org/tmppdfs/17760300-1531.pdf]

Calculating Horsepower Requirements and Sizing Irrigation Supply Pipelines. Texas Cooperative Extension Fact Sheet Fact Sheet B-6011.
[Fipps, Guy. 1995. Calculating Horsepower Requirements and Sizing Irrigation Supply Pipelines. Texas Cooperative Extension Fact Sheet Fact Sheet B-6011. Texas Cooperative Extension Fact Sheet Fact Sheet B-6050. Texas Cooperative Extension Fact Sheet B-6113. Texas A&M University System, College Station, TX. 11 pp. http://itc.tamu.edu/documents/extensionpubs/B-6011.pdf]

Irrigation Scheduling:
Evapotranspiration

This topic will expand on the crop water demand concepts to include effects of atmospheric conditions as well as crop type, growth stage, etc. Evapotranspiration networks and related tools and information can be very useful in irrigation management. This topic will be adapted to emphasize locally available information resources, as appropriate.

What is Evapotranspiration?

The Texas High Plains Evapotranspiration Network Website and User Manual
http://txhighplainset.tamu.edu/
http://txhighplainset.tamu.edu/usermanual.pdf

What is ET?
http://txhighplainset.tamu.edu/terminology.jsp

GROWER'S GUIDE: Using PET for Determining Crop Water Requirements and Irrigation Scheduling
http://texaset.tamu.edu/growers.php

Applying Evapotranspiration to Improve Irrigation Scheduling

GROWER'S GUIDE: Using PET for Determining Crop Water Requirements and Irrigation Scheduling
http://texaset.tamu.edu/growers.php

Additional "how to" manual is under development by staff of the Texas High Plains Evapotranspiration Network.

Evapotranspiration Networks in Texas

Texas High Plains Evapotranspiration Network - http://txhighplainset.tamu.edu/
- North Plains ET Network - http://amarillo2.tamu.edu/nppet/petnet1.htm
- South Plains ET Network - http://lubbock.tamu.edu/irrigate/weatherdata.php

Texas Evapotranspiration Network - http://texaset.tamu.edu/
Precision Irrigators Network - http://uvalde.tamu.edu/

Demonstrations of data access, applications, tools available, etc. for local evapotranspiration networks will be incorporated into the conference, as appropriate to the location and audience.

Irrigation Scheduling:
Soil Moisture Management and Monitoring

Introduction to Soil Properties and Soil Moisture Relationships (and How They Affect Irrigation Management)

Texture, structure, layers, etc. (root zone depth and soil moisture basics)
Introduction to the NRCS Soil Surveys
Permeability (infiltration, runoff, Irrigation management considerations)
Hydraulic conductivity (soil water movement and distribution)
Soil moisture release curves (soil water content and potential)
- Saturation
- Field capacity
- Permanent wilting point
- Plant available water

Applying Knowledge of Soils to Improve Soil Moisture Management

Plant available water storage capacity with depth in root zone (general guidelines and example calculations for major soil series groups by region)
Soil moisture monitoring methods

Reference Resources:

Irrigation Monitoring with Soil Water Sensors. Texas Cooperative Extension Fact Sheet B-6194.
[Enciso, Juan M., Dana Porter and Xavier Périès. 2007. Irrigation Monitoring with Soil Water Sensors. Texas Cooperative Extension Fact Sheet B-6194. A&M University System, College Station, TX. 12 pp. http://tcebookstore.org/tmppdfs/18017893-2411.pdf]

Pre-plant Irrigation Management

[Porter, Dana. 2003. Pre-plant Irrigation Management. In: FOCUS on Entomology for South Plains Agriculture. S5-02/03. April 11, 2003. Texas A&M University Agricultural Research and Extension Center, Lubbock, TX.
http://lubbock.tamu.edu/irrigate/usefulPublications/prePlantIrrigation.pdf]

Soil Properties Affecting Soil Moisture Dynamics

Summaries for predominant soils under irrigated production are being developed for the regions. Some of these are completed.

USDA-NRCS Soil Surveys

Print Soil Surveys (where available) or printouts of electronically available soil survey data will be used in exercises (where appropriate) to calculate soil water holding capacity, etc. for soils of particular interest to participants.

Interactive Web Soil Survey http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

Website and association tools will be demonstrated. Key soils for the area will be used in exercises.

Online Soil Surveys for Texas

http://soils.usda.gov/survey/online_surveys/texas/

Soil Moisture Management. Texas Cooperative Extension Fact Sheet B-1670.

[Fipps, Guy. 1995. Soil Moisture Management. Texas Cooperative Extension Fact Sheet B-1670. Texas A&M University System, College Station, TX. 8pp.
http://itc.tamu.edu/documents/extensionpubs/B-1670.pdf]

Irrigation Technologies and Best Management Practices:
Surface Irrigation

Surface Methods: Furrow, flood, level basin
Distribution and delivery systems
Selection and applications
- Irrigation districts
- Soil and topography considerations
- Energy and labor considerations
- Relative efficiency
- Distribution uniformity issues

Surface Method Best Management Practices

Examples: Field layout; tailwater re-use systems; cut back flow management; surge irrigation; alternate furrow application; land grading/leveling; high flow turnouts; canal lining; underground pipeline distribution; flexible (poly) pipe; gated pipe, etc.)

Reference Resources:

Irrigation District Engineering and Assistance Program: http://idea.tamu.edu/

Selected materials from the IDEA program will be incorporated into the Irrigation Training Program for some audiences as appropriate.

Using Flexible Pipe (poly-pipe) with Surface Irrigation. Texas Cooperative Extension Fact Sheet L-5469.

[Enciso, Juan, and Xavier Peries. 2005. Using Flexible Pipe (poly-pipe) with Surface Irrigation. Texas Cooperative Extension Fact Sheet L-5469. Texas A&M University System, College Station, TX. 4 pp. http://primera.tamu.edu/faculty/Juan_Enciso/Website/Exten%20pubs/L-5469.pdf]

Potential Water Savings in Irrigated Agriculture for the Rio Grande Planning Region (Region M)

[Fipps, Guy. 2000. Potential Water Savings in Irrigated Agriculture for the Rio Grande Planning Region (Region M). Report submitted to the Texas Water Development Board. http://www.twdb.state.tx.us/rwp/m/Submitted_Files/02-Volume%20II/05%20-%20Tech%20Memos/10%20-%20Fipps-IrrAg/00%20-%20Report.doc]

USDA-NRCS Conservation Practice Standards

http://www.nrcs.usda.gov/technical/Standards/nhcp.html

Examples of USDA-NRCS materials related to surface irrigation:

Irrigation Canal or Lateral

ftp://ftp-fc.sc.egov.usda.gov/NHQ/practice-standards/standards/320.pdf

ftp://ftp-fc.sc.egov.usda.gov/NHQ/practice-standards/cppe/examples/320info.pdf

Irrigation Field Ditch

ftp://ftp-fc.sc.egov.usda.gov/NHQ/practice-standards/standards/388.pdf

ftp://ftp-fc.sc.egov.usda.gov/NHQ/practice-standards/standards/388.pdf

Irrigation Land Leveling

ftp://ftp-fc.sc.egov.usda.gov/NHQ/practice-standards/standards/464.pdf

ftp://ftp-fc.sc.egov.usda.gov/NHQ/practice-standards/standards/464.pdf

Tailwater Recovery (Reuse) System

ftp://ftp-fc.sc.egov.usda.gov/NHQ/practice-standards/standards/447.pdf

ftp://ftp-fc.sc.egov.usda.gov/NHQ/practice-standards/cppe/examples/447info.pdf

Irrigation Technologies and Best Management Practices:
Center Pivot Irrigation

Center Pivots and Linear Systems: Overview

High Pressure & Low Pressure Systems

How the equipment works

Electric & hydraulic move systems

Components

Add-ons (end guns, chemigation equipment, etc.)
Safety issues

Low Pressure Center Pivot and Linear Systems

Low Energy Precision Application (LEPA)
Package deal (furrow dikes, planting patterns, etc.)
Low Elevation Spray Application (LESA)
Mid-Elevation Spray Application (MESA)
Low Pressure In-Canopy Application (LPIC)
Nozzle Packages, equipment options (including pressure regulators)
Irrigation management
System maintenance, trouble-shooting
Soil and topography considerations
Energy and labor considerations
Application efficiency
Distribution uniformity

Reference Resources:

Center Pivot Irrigation. Texas Cooperative Extension Fact Sheet B-6096.
[New, Leon and Guy Fipps. 2000. Center Pivot Irrigation. Texas Cooperative Extension Fact Sheet B-6096. Texas Cooperative Extension Fact Sheet L-5469. Texas A&M University System, College Station, TX. 20 pp. http://itc.tamu.edu/documents/extensionpubs/B6096.pdf]

Center Pivot Irrigation Workbook. Texas Cooperative Extension Fact Sheet B-6162.
[Fipps, Guy, and Leon New. 2005 Center Pivot Irrigation Workbook. Texas Cooperative Extension Fact Sheet B-6162. Texas A&M University System, College Station, TX. 35 pp.]

USDA-NRCS Conservation Practice Standards
http://www.nrcs.usda.gov/technical/Standards/nhcp.html
USDA-NRCS Sprinkler Irrigation Standard:
ftp://ftp-fc.sc.egov.usda.gov/NHQ/practice-standards/standards/442.pdf

Irrigation Technologies and Best Management Practices:
Microirrigation

Subsurface Drip Irrigation
Surface Drip Irrigation
Microspray Irrigation
Essential components

(Pump(s), distribution lines, filter station components, chemical injection equipment, controllers, manifolds, flush lines and valves, pressure and vacuum relief valves, lateral lines, emitters)
Planning, layout, water quality considerations (things to consider before system design)
Microirrigation System Management and Maintenance
Irrigation management
Managing root zone moisture with irrigation frequency/duration
System maintenance, trouble-shooting
Monitoring pressure and flow
Acid injection, flushing, chlorination
Filter maintenance

Reference Resources:

Basics of Microirrigation. Texas Cooperative Extension Fact Sheet B-6160.
[Enciso, Juan, and Dana Porter. 2005. Basics of Microirrigation. Texas Cooperative Extension Fact Sheet B-6160. Texas A&M University System, College Station, TX. 16 pp.]

Installing a Subsurface Drip Irrigation System for Row Crops. Texas Cooperative Extension Fact Sheet B-6151.
[Enciso, Juan. 2004. Installing a Subsurface Drip Irrigation System for Row Crops. Texas Cooperative Extension Fact Sheet B-6151. Texas Cooperative Extension Fact Sheet B-6160. Texas A&M University System, College Station, TX. 7 pp. http://tcebookstore.org/tmppdfs/17760300-1981.pdf]

Maintaining Subsurface Drip Irrigation Systems. Texas Cooperative Extension Fact Sheet L-5406.
[Enciso, Juan, Dana Porter, Jim Bordovsky and Guy Fipps. 2001. Maintaining Subsurface Drip Irrigation Systems. Texas Cooperative Extension Fact Sheet L-5406. Texas A&M University System, College Station, TX. 6 pp.
http://itc.tamu.edu/documents/extensionpubs/L5406.pdf]

USDA-NRCS Conservation Practice Standards
http://www.nrcs.usda.gov/technical/Standards/nhcp.html
USDA-NRCS Microrrigation Standard:
ftp://ftp-fc.sc.egov.usda.gov/NHQ/practice-standards/standards/441.pdf

Best Management Practices

Agricultural Water Conservation Practices
http://www.twdb.state.tx.us/assistance/conservation/ConservationPublications/AgBrochure.pdf

Water Conservation Best Management Practices (BMP) Guide for Agriculture in Texas
http://www.tsswcb.state.tx.us/files/contentimages/water_conservation_bmp.pdf

USDA-NRCS National Conservation Practice Standards
http://www.nrcs.usda.gov/technical/Standards/nhcp.html

Best Management Practices:
Conservation Tillage

Texas Cooperative Extension Conservation Tillage Website
http://conservationtillage.tamu.edu/

Best Management Practices for Conservation/Reduced Tillage. Texas Cooperative Extension Fact Sheet B-6189.
[Abrameit, Archie , Charles Stichler and Mark L. McFarland. 2006. Best Management Practices for Conservation/Reduced Tillage. Texas Cooperative Extension Fact Sheet B-6189. Texas A&M University System, College Station, TX. 8 pp. http://tcebookstore.org/pubinfo.cfm?pubid=2313]

Southern Conservation Agricultural Systems Conference
http://www.ag.auburn.edu/auxiliary/nsdl/sctcsa/index.html

USDA-NRCS National Conservation Practice Standards
http://www.nrcs.usda.gov/technical/Standards/nhcp.html

Water Quality Issues in Irrigation:
Salinity Management

Emphasis upon salinity management will depend upon the relative local importance of the issue.

Irrigation Water Quality Standards and Salinity Management Strategies. Texas Cooperative Extension Fact Sheet B-1667.
[Fipps, Guy. 2003. Irrigation Water Quality Standards and Salinity Management Strategies. Texas Cooperative Extension Fact Sheet B-1667. Texas A&M University System, College Station, TX. 20 pp. http://itc.tamu.edu/documents/extensionpubs/B-1667.pdf]

Irrigation Water Quality: Critical Salt Levels for Peanuts, Cotton, Corn and Grain Sorghum. Texas Cooperative Extension Fact Sheet L-5417.
[McFarland, Mark, Robert Lemon and Charles Stichler. 2003. Irrigation Water Quality: Critical Salt Levels for Peanuts, Cotton, Corn and Grain Sorghum. Texas Cooperative Extension Fact Sheet L-5417. Texas A&M University System, College Station, TX. 4 pp. http://itc.tamu.edu/documents/extensionpubs/L-5417.pdf]

Irrigation Management with Saline Water.
[Porter, Dana and Thomas Marek. 2006. Irrigation Management with Saline Water. 2006. In: Proceedings of the 2006 Central Plains Irrigation Conference, Colby, KS, February 21-22, 2006. http://www.oznet.ksu.edu/irrigate/OOW/P06/Porter06.pdf]

Water Quality Issues in Irrigation:
Protecting Water Resources from Contamination

Specific emphasis within this topic will depend upon local issues.

Pesticide Properties that Affect Water Quality. Texas Cooperative Extension Fact Sheet Fact Sheet B-6050.
[Stevenson, Douglass E., Paul Baumann, and John A. Jackman. 1997. Pesticide Properties that Affect Water Quality. Texas Cooperative Extension Fact Sheet Fact Sheet B-6050. Texas Cooperative Extension Fact Sheet L-5417. Texas A&M University System, College Station, TX. 16 pp. http://publications.tamu.edu/publications/Water/b6050.pdf]

Best Management Practices for Water Quality Protection in Agriculture.
[Porter, Dana O. 2004. *TCE Best Management Practices Education and Training Program. Curriculum and support materials to promote BMP adoption to prevent groundwater contamination by pesticides. Selected relevant materials from this package will be incorporated into the Irrigation Training Program Package.]*

Crop-Specific Irrigation Guidelines

Items to be addressed for major crops (such as corn, cotton, sorghum, hay/forage) include:

Critical growth stages
Crop water use curves; yield response curves
Effective root zone depth
Crop physiology
Water quality (salinity tolerance) concerns
Crop-Specific water management

Irrigation guidelines and related information for additional crops will be included in the appendices. Specific crops addressed in each conference will be adapted to address local needs.

How Plants Use Water

This topic introduces irrigation management from a crop physiology perspective. We start by asking the questions, "How does the plant use water? How does it respond to drought stress or to too much water? How do we manage water and fertility to get optimum results from the crop?" Items to be addressed on a crop specific basis within each section.

Publications for inclusion and references

B-6189 -- Best Management Practices for Conservation/Reduced Tillage; Charles Stichler, Archie Abrameit and Mark McFarland

L-5436 - Reduced/Conservation Tillage in South and Central Texas; Charles Stichler and Steve Livingston

SCS – 1999-17 Water Conservation in Field Crops in South West Texas; Travis Miller (This is a Soil and Crop Science publication located on their website – it is not available through Ag. Com.)

B-6048 - Irrigated and Dryland Sorghum Production in South and Southwest Texas; Charles Stichler; Cloyce Coffman;

L-5434 - Irrigating Sorghum in South and South Central Texas: Charles Stichler, Guy Fipps

L-5417 - Irrigation Water Quality; Critical Salt Levels for Peanuts, Cotton, Corn and Grain Sorghum; Mark McFarland, Robert Lemon, Charles Stichler

B-6053 -- Crop Nutrient Needs in South and Southwest Texas; Charles Stichler, Mark McFarland

Irrigation Management for Corn Production

Texas Corn Production Emphasizing Pest Management and Irrigation. Texas Cooperative Extension Fact Sheet B-6177 and Companion Website: http://lubbock.tamu.edu/cornIPM/

[Porter, P., G. Schuster, D. Porter, N. Troxclair, E. Bynum, G. Cronholm, C. Patrick and S. Davis. 2005. Texas Corn Production Emphasizing Pest Management and Irrigation. Texas Cooperative Extension Fact Sheet B-6177. Texas A&M University System, College Station, TX. 72 pp. Companion Website: http://lubbock.tamu.edu/cornIPM/]

Irrigation Management for Cotton Production

2005 Cotton Resource CD and Website

http://lubbock.tamu.edu/cottoncd/

The Cotton-CD project was coordinated by Dr. Robert Lemon, State Extension Cotton Specialist at College Station; and Dr. Randy Boman, Extension Agronomist-Cotton at Lubbock; Texas Cooperative Extension, Department of Soil and Crop Sciences, Texas A&M University System. The Cotton-CD contains information on several key areas of cotton production and management, including irrigation management and related topics. Selected items from the Cotton Resource CD will be incorporated into the Irrigation Training Program package.

Irrigation Management for Sorghum Production

Grain Sorghum Irrigation. Texas Cooperative Extension Fact Sheet B-6152.

[New, Leon. 2004. Grain Sorghum Irrigation. Texas Cooperative Extension Fact Sheet B-6152. Texas A&M

University System, College Station, TX. 8 pp.
http://tcebookstore.org/tmppdfs/18017893-B6152.pdf]

Irrigating Sorghum in South and South Central Texas. Texas Cooperative Extension Fact Sheet L-5434.
[Stichler, Charles and Guy Fipps. 2003. Irrigating Sorghum in South and South Central Texas. Texas Cooperative Extension Fact Sheet L-5434. Texas A&M University System, College Station, TX. 6 pp. http://itc.tamu.edu/documents/extensionpubs/L-5434.pdf]

Irrigation Management for Forage Production

Irrigation of Forage Crops. Texas Cooperative Extension Fact Sheet B-6150.
[Enciso, Juan, Dana Porter, Guy Fipps and Paul Colaizzi. 2004.
Irrigation of Forage Crops. Texas Cooperative Extension Fact Sheet B-6150. Texas A&M University System, College Station, TX. 8 pp.
http://primera.tamu.edu/faculty/Juan_Enciso/Website/Exten%20pubs/B6150.pdf]

Irrigation Management for Peanut Production

Texas Peanut Production Guide. Texas Cooperative Extension Fact Sheet B-1514.
[Lemon, Robert G., Editor. 2001. Texas Peanut Production Guide. Texas Cooperative Extension Fact Sheet B-1514. Texas A&M University System, College Station, TX. 84 pp. http://itc.tamu.edu/documents/extensionpubs/B-1514.pdf]

Production of Virginia Peanuts in the Rolling Plains and Southern High Plains of Texas. Texas Cooperative Extension Fact Sheet B-1514.
[Lemon, Robert G., and Chip Lee. 1995. Production of Virginia Peanuts in the Rolling Plains and Southern High Plains of Texas. Texas Cooperative Extension Fact Sheet B-1514. Texas A&M University System, College Station, TX. 4 pp.
http://itc.tamu.edu/documents/extensionpubs/L-5140.pdf]

Additional Information Resources

Texas A&M University System
Irrigation Technology Center
http://itc.tamu.edu/
Texas Water Resources Institute
http://twri.tamu.edu/
Texas A&M Agricultural Research and Extension Centers
Amarillo: http://amarillo.tamu.edu/
Lubbock: http://lubbock.tamu.edu/

San Angelo: http://sanangelo.tamu.edu/
Temple (Blackland): http://www.brc.tamus.edu/
Uvalde: http://uvalde.tamu.edu/
Vernon: http://vernon.tamu.edu/
Weslaco: http://www.taes-weslaco.net/

Texas A&M University Water Program
http://texaswater.tamu.edu/

Texas State Soil and Water Conservation Board
http://www.tsswcb.state.tx.us/

Texas Water Development Board
http://www.twdb.state.tx.us/home/index.asp
Agricultural Water Conservation
http://www.twdb.state.tx.us/assistance/conservation/agricons.asp
Water Planning (including state and regional water plans)
http://www.twdb.state.tx.us/rwpg/planning_page.asp

United States Department of Agriculture
USDA-Natural Resources Conservation Service
http://www.nrcs.usda.gov/
(Access to excellent technical and non-technical resources related to water conservation, irrigation practices, soils, plants, farm programs, conservation cost-share programs, etc.)
USDA-Agricultural Research Service
Conservation and Production Research Laboratory – Bushland, TX
http://www.cprl.ars.usda.gov/
Soil & Water Management Research Unit
http://www.cprl.ars.usda.gov/swmru_research.htm
(excellent information on irrigation technology evaluations and crop-specific irrigation research)
Grassland Soil and Water Research Laboratory – Temple, TX
http://www.ars.usda.gov/spa/gswrl
USDA-ARS National Water and Climate Center
http://www.wcc.nrcs.usda.gov/
USDA-ARS George E. Brown Salinity Laboratory
http://www.ars.usda.gov/Services/docs.htm?docid=8908
USDA-National Agricultural Statistics Service
http://www.nass.usda.gov/index.asp
USDA-Economics Research Service
http://www.ers.usda.gov/

United States Geological Survey
http://www.usgs.gov/
Texas Alliance of Groundwater Conservation Districts
http://www.texasgroundwater.org/
Texas Agricultural Irrigation Association
http://www.taia.org/
The Irrigation Association
http://www.irrigation.org/

Irrigation Training Program Manual
Electronic Editions

Irrigation Training Program Manual – North Texas Edition

Irrigation Training Program Manual – South Texas Edition

Irrigation Training Program Conference Flyers

TEXAS A&M AgriLIFE
Teaching • Research • Extension • Service

IRRIGATION TRAINING PROGRAM

TUESDAY, AUGUST 19, 2008
8 A.M. TO 3:30 P.M.
FIRST UNITED METHODIST CHURCH
301 S AVENUE J
CHILLICOTHE, TX

DON'T MISS:

- ***Learn more about efficient tools & techniques of irrigation management***
- ***Presentations on: soil moisture management, irrigation timing, cost-share programs & water issues legislation***
- ***Afternoon Field Demonstrations (center-pivot & drip irrigation systems)***
- ***BBQ lunch provided***

Interested participants can register online at **http://watereducation.tamu.edu**
or by calling **Heather Easterling** at (940) 552-9941 ext. 252
(Pre-registration is requested but not necessary)

Continuing Education Units will be available

Please support our Program Co-Sponsors:
First Priority Irrigation, Wellington
Goldenspread International Services, Inc., Memphis
Waggoner & Son Electric, Inc., Vernon
Kuehler Irrigation Company, Inc., Munday

Soil Water TSSWCB

Texas Water Resources Institute
make every drop count

TEXAS WATER DEVELOPMENT BOARD

TEXAS A&M *Agri*LIFE

Teaching • Research • Extension • Service

7TH RIO GRANDE VALLEY IRRIGATION CONFERENCE & TRADE SHOW

WEDNESDAY, OCTOBER 29, 2008
7:30 A.M. TO 3:30 P.M.
RIO GRANDE VALLEY LIVESTOCK SHOW
1000 NORTH TEXAS AVE.
MERCEDES, TX

DON'T MISS:

- **Learn more about efficient tools & techniques of irrigation management, cost-share programs, irrigation district rehabilitation and modernization & current water supply for the Valley**
- **Earn Continuing Education Units**
- **Visit Trade Show exhibits**

Registration at the door. $10 registration includes breakfast, lunch & admission to trade show and conference.

For more information, contact your county Extension agent.

Hidalgo County	Brad Cowan	956-383-1026
Cameron County	Dr. Enrique Perez	956-361-8236
Starr County	Omar Montemayor	956-487-2306
Willacy County	Lucas Garcia	956-689-2412

Conference Sponsors
Texas Water Development Board, Texas AgriLife Extension Service, Irrigation Technology Center, Texas Water Resources Institute, Texas State Soil and Water Conservation Board and Lower Rio Grande Valley Water District Managers Association

TEXAS A&M AgriLIFE
Teaching • Research • Extension • Service

GULF COAST IRRIGATION CONFERENCE & TRADE SHOW

TUESDAY, NOVEMBER 18, 2008
8:30 A.M. TO 3:30 P.M.
SAN PATRICIO COUNTY FAIRGROUNDS AND CIVIC CENTER
219 5TH STREET
SINTON, TX

DON'T MISS:

- Learn more about efficient tools & techniques of irrigation management, cost-share programs, regional water planning, oil brine contamination and Gulf Coast Aquifer water quality
- Earn Continuing Education Units
- Visit Trade Show exhibits

Registration

$15 in advanced; $20 at the door
Registration includes lunch & admission to trade show and conference.
To register, contact Duane Campion, San Patricio County Extension office, at (361)-364-6234.

Conference Sponsors
Texas Water Development Board, Texas AgriLife Extension Service, Irrigation Technology Center, Texas Water Resources Institute, and Texas State Soil and Water Conservation Board

TEXAS A&M AgriLIFE

Teaching • Research • Extension • Service

HIGH PLAINS IRRIGATION CONFERENCE & TRADE SHOW

WEDNESDAY, JANUARY 14, 2009

8:30 A.M. TO 4:00 P.M.

AMARILLO CIVIC CENTER
(NORTH EXHIBIT HALL)

401 SOUTH BUCHANAN STREET

AMARILLO, TX

DON'T MISS:

- Learn more about the Ogallala Aquifer, impacting irrigation finances, application of irrigation technologies, & other regional topics
- Earn Continuing Education Units:
  - Irrigation Association CID *(4.5 CEUs)*
  - Certified Crop Advisor *(5 Soil and Water Management CEUs)*
  - Pesticide Applicator *(2 CEUs)*
- Visit Trade Show exhibits including industry, groundwater districts, & educational exhibits

Registration is $15 at the door and includes lunch & admission to trade show and conference. *(No pre-registration required)*

For more information, contact Nich Kenny at (806) 677-5600.

Sponsors

Texas Water Development Board, Texas AgriLife Extension Service, Texas Agricultural Irrigation Association, Texas State Soil and Water Conservation Board, USDA-Natural Resources Conservation Service, Texas Water Resources Institute

TEXAS A&M AgriLIFE
Teaching • Research • Extension • Service

SOUTH TEXAS IRRIGATION CONFERENCE & TRADE SHOW

TUESDAY, JANUARY 20, 2009
8:30 A.M. TO 4:00 P.M.
MEDINA COUNTY FAIR HALL
FM 462 NORTH
HONDO, TX

DON'T MISS:

- Learn more about efficient tools & techniques of irrigation management, irrigation finances, cost-share & water conservation programs & other regional topics
- Earn Continuing Education Units
- Visit Trade Show exhibits

Registration is $15 in advance, $20 at the door. Registration includes lunch & admission to trade show and conference. To pre-register, contact Texas AgriLife Extension Service office in Medina County at 830-741-6180.

Sponsors
Evergreen Groundwater Conservation District, Medina County Groundwater Conservation District, Uvalde County Groundwater Conservation District, Edwards Aquifer Authority, Texas Agricultural Irrigation Association, Irrigation Technology Center, Texas AgriLife Extension Service, Texas Water Resources Institute, Texas Water Development Board, Texas State Soil & Water Conservation Board

Irrigation Training Program Conference News Releases

Agnews News & Public Affairs
A Service of Texas A&M AgriLife

Irrigation Training Program Set for Chillicothe

July 25, 2008
Writer(s): *Kay Ledbetter, 806-677-5600,SKledbetter@ag.tamu.edu*
Contact(s): *Dr. John Sij, 940-552-9941, jsij@ag.tamu.edu*
Dr. Dana Porter, 806-746-6101, dporter@ag.tamu.edu

CHILLICOTHE – Efficient irrigation tools and techniques will be the spotlight of a one-day irrigation training Aug. 19 at Chillicothe.

The program will run from 8 a.m. to 3:30 p.m., with the morning portion held at the First United Methodist Church, 301 S. Avenue J. It will offer both certified crop advisor and pesticide applicator continuing education credits.

The event is hosted by the Texas AgriLife Extension Service, Texas AgriLife Research and Texas A&M AgriLife's Texas Water Resources Institute.

Only about 10 percent of Rolling Plains cropland is irrigated, but it accounts for a consistent portion of the agricultural income for the region, said Dr. John Sij, Texas AgriLife Research agronomist in Vernon, who is coordinating the event with Dr. Dana Porter, AgriLife Extension agricultural engineer in Lubbock.

Irrigation is found primarily in the southern portion of the Rolling Plains and into southwest Oklahoma, he said. "This workshop is part of a six-workshop series being conducted around the state," Porter said. "With increasing commodity prices, we have seen a greater interest in irrigation in that part of the state."

During the program, participants will hear about soil-moisture management, irrigation timing, applications of center-pivot and drip-irrigation technologies and updates on cost-share programs and water-issues legislation. The afternoon will include field tours on and around the AgriLife Research station south of Chillicothe, Sij said. The first stop will be at a center-pivot system, and concluding the day's activities will be a stop at the Chillicothe station's new sub-surface drip irrigation research. There participants will see cotton, sorghum, corn, sesame and four forage varieties growing under drip irrigation.

Industry personnel will be available at both locations to answer questions on the equipment and maintenance, he said.

Interested participants can register online at http://watereducation.tamu.edu or by calling Heather Easterling at 940-552-9941, ext 252. Pre-registration is not necessary, but will help sponsors plan for the free barbecue lunch.

The Chillicothe event is the second of six irrigation training program events being held around the state. Each event will offer region-specific information about irrigation practices, cropping systems and climates.

The first training was at Lubbock, with others scheduled at Mercedes in October, San Patricio County in November, Uvalde in November and Amarillo in January.

Other agencies involved in the statewide program are: Texas State Soil and Water Conservation Board and Natural Resources Conservation Service. The project is funded by the Texas Water Development Board's Agricultural Water Conservation Grant.

For more information about upcoming programs, contact Cecilia Wagner at cawagner@ag.tamu.edu or 979-845-1851.

Web Page Address: http://agnews.tamu.edu/showstory.php?id=602

Irrigation training program set for Chillicothe

Aug 1, 2008 8:18 AM, By Kay Ledbetter
Texas A&M University

Efficient irrigation tools and techniques will be the spotlight of a one-day irrigation training Aug. 19 at Chillicothe.

The program will run from 8 a.m. to 3:30 p.m., with the morning portion held at the First United Methodist Church, 301 S. Avenue J. It will offer both certified crop advisor and pesticide applicator continuing education credits.

The event is hosted by the Texas AgriLife Extension Service, Texas AgriLife Research and Texas A&M AgriLife's Texas Water Resources Institute.

Only about 10 percent of Rolling Plains cropland is irrigated, but it accounts for a consistent portion of the agricultural income for the region, said Dr. John Sij, Texas AgriLife Research agronomist in Vernon, who is coordinating the event with Dr. Dana Porter, AgriLife Extension agricultural engineer in Lubbock.

Irrigation is found primarily in the southern portion of the Rolling Plains and into southwest Oklahoma, he said. "This workshop is part of a six-workshop series being conducted around the state," Porter said. "With increasing commodity prices, we have seen a greater interest in irrigation in that part of the state."

During the program, participants will hear about soil-moisture management, irrigation timing, applications of center-pivot and drip-irrigation technologies and updates on cost-share programs and water-issues legislation. The afternoon will include field tours on and around the AgriLife Research station south of Chillicothe, Sij said. The first stop will be at a center-pivot system, and concluding the day's activities will be a stop at the Chillicothe station's new sub-surface drip irrigation research. There participants will see cotton, sorghum, corn, sesame and four forage varieties growing under drip irrigation.

Industry personnel will be available at both locations to answer questions on the equipment and maintenance, he said.

Interested participants can register online at http://watereducation.tamu.edu or by calling Heather Easterling at 940-552-9941, ext 252. Pre-registration is not necessary, but will help sponsors plan for the free barbecue lunch.

The Chillicothe event is the second of six irrigation training program events being held around the state. Each event will offer region-specific information about irrigation practices, cropping systems and climates.

The first training was at Lubbock, with others scheduled at Mercedes in October, San Patricio County in November, Uvalde in November and Amarillo in January.

Other agencies involved in the statewide program are: Texas State Soil and Water Conservation Board and Natural Resources Conservation Service. The project is funded by the Texas Water Development Board's Agricultural Water Conservation Grant.

For more information about upcoming programs, contact Cecilia Wagner at cawagner@ag.tamu.edu or 979-845-1851.

8/1/2008 10:2

Irrigation Training Program Set for Chillicothe, Texas Aug. 19

Efficient irrigation tools and techniques will be the spotlight of one-day training.

By: Compiled by staff

Published: Aug 7, 2008

By Kay Ledbetter

Efficient irrigation tools and techniques will be the spotlight of a one-day irrigation training Aug. 19 at Chillicothe, Texas. The program is 8 a.m. to 3:30 p.m., with the morning part at First United Methodist Church, 301 S. Avenue J. It will offer both certified crop adviser and pesticide applicator continuing education credits. The event is hosted by the Texas AgriLife Extension Service, Texas AgriLife Research, and Texas A&M AgriLife's Texas Water Resources Institute.

Only about 10% of Rolling Plains' cropland is irrigated, but it accounts for a consistent portion of the agricultural income for the region, says Dr. John Sij, Texas AgriLife Research agronomist in Vernon, who is coordinating the event with Dr. Dana Porter, AgriLife Extension agricultural engineer in Lubbock.

Rolling Plains irrigation is mostly in the southern portion, and in southwest Oklahoma. This workshop is part of a six-workshop series begin conducted around the state, Porter says. With increasing commodity prices, there's a greater interest in irrigation in that region.

During the program, participants will hear about soil-moisture management, irrigation timing, applications of center-pivot and drip-irrigation technologies, and updates on cost-share programs and water-issue legislation. The afternoon will include field tours on and around the AgriLife Research station at Chillicothe, Sij says. The first afternoon stop will be a center-pivot system, and concluding the day's activities will be a stop at the Chillicothe station's new subsurface drip irrigation research. There, participants will see cotton, sorghum, corn, sesame and four forage varieties growing under drip irrigation.

Industry personnel will be at both locations to answer questions on the equipment and maintenance. You can register online to attend at watereducation.tamu.edu or by calling Heather Easterling at 940-552-9941, Ext. 252. Pre-registration isn't necessary, but helps sponsors plan the free lunch.

The Chillicothe event is the second of six irrigation training program events being held around the state. Each event will offer region-specific information about irrigation practices, cropping systems and climates.

Other agencies involved are the Texas Soil and Water Conservation Development Board and Natural Resources Conservation Service. The project is funded by the Texas Water Development Board's Agricultural Water Conservation Grant. For more, contact Cecilia Wagner at cawagner@ag.tamu.edu or call 979-845-1851.

- Kay Ledbetter is with Texas AgriLife Communications, Amarillo.

Comments

Read comments from others and share your own thoughts.

Agnews News & Public Affairs
A Service of Texas A&M AgriLife

Valley Irrigation Meet Slated in Mercedes

October 24, 2008
Writer(s): *Rod Santa Ana, 956-878-8317,r-santaana@tamu.edu*
Contact(s): *Dr. Juan Enciso, 956-968-5581, JEnciso@ag.tamu.edu*
Cecilia Wagner, 979-458-1138, CAWagner@ag.tamu.edu

WESLACO -- Growers from throughout South Texas and northern Mexico are expected for the 7th Rio Grande Valley Irrigation and Conference Trade Show set for Oct. 29 in Mercedes, according to an irrigation expert at Texas AgriLife Extension Service.

“We’re expecting a large crowd from Mexico, because like growers everywhere, they are very much interested in using the latest irrigation technologies that can help them save water while maximizing profits,” said Dr. Juan Enciso, an AgriLife Extension irrigation specialist in Weslaco.

To better appreciate the day’s speakers, Spanish translations will be provided, Enciso said.

The conference and trade show is sponsored by Texas A&M AgriLife’s Texas Water Resources Institute and Irrigation Technology Center, and the Lower Rio Grande Valley Water District Managers Association. The event will begin at 8 a.m. at the Rio Grande Valley Livestock Showgrounds, 1000 N. Texas Ave., in Mercedes.

A $10 registration fee includes breakfast, lunch and admission to the trade show and educational sessions. Participants can receive two hours of certified crop advisor or pesticide applicator continuing education credits, said Cecilia Wagner, a Texas Water Resources Institute project manager. “Irrigation experts, including Extension agricultural engineers Dr. Guy Fipps of College Station, Dr. Dana Porter of Lubbock and Dr. Enciso will speak on improved irrigation technologies and crop management,” she said.

Other speakers include Erasmo Yarrito, the Rio Grande Watermaster team leader; Dwight Head, USDA Natural Resources Conservation Service engineer; Alan Moore, Cameron County Drainage District manager; Jonathan Diaz, Texas Commission on Environmental Quality specialist; and Charles Stichler, retired AgriLife Extension agronomist.

The luncheon speaker will be Hidalgo County Judge J.D. Salinas.

This conference and trade show is the third of six scheduled events of the Irrigation Training Program, a collaborative effort among the Texas Water Resources Institute, AgriLife Extension, Texas State Soil and Water Conservation Board and the U.S. Department of Agriculture’s Natural Resources Conservation Service.

The Texas Water Development Board funds the project through its Agricultural Water Conservation Grant program, Wagner said. “These events are held around the state to help growers and others learn about efficient tools and techniques of irrigation management,” she said. “Each event offers region-specific information about irrigation practices, cropping systems, policy updates and cost-share programs available to local producers.”

The next such event, the Gulf Coast Irrigation Conference, is scheduled for Nov. 18 in Sinton.

For more information about the Rio Grande Valley or Coastal Bend conference events, visit http://itc.tamu.edu/confernces.php .

For more information on the Irrigation Training Program, visit http://twri.tamu.edu/project-inf/ITP/ .

Valley irrigation meet slated in Mercedes

Comments | Recommend

October 23, 2008 - 1:03PM

Rod Santa Ana III
Texas AgriLife Communications

WESLACO — Growers from throughout South Texas and northern Mexico are expected for the seventh Rio Grande Valley Irrigation Conference and Trade Show set for Oct. 29 in Mercedes, according to an irrigation expert at Texas AgriLife Extension Service.

"We're expecting a large crowd from Mexico, because like growers everywhere, they are very much interested in using the latest irrigation technologies that can help them save water while maximizing profits," said Dr. Juan Enciso, an Extension irrigation specialist in Weslaco.

To better appreciate the day's speakers, Spanish translations will be provided, Enciso said.

The conference and trade show is sponsored by the Texas Water Resources Institute, the Lower Rio Grande Valley Water District Managers Association and the Irrigation Technology Center.

The event will be at the Rio Grande Valley Livestock Showgrounds, 1000 N. Texas Ave., in Mercedes.

A $10 registration fee includes breakfast, lunch and admission to the trade show and educational sessions. Participants can receive two hours of certified crop adviser or pesticide applicator continuing education credits, said Cecilia Wagner, a Texas Water Resources Institute project manager.

"Irrigation experts, including Extension agricultural engineers Dr. Guy Fipps of College Station, Dr. Dana Porter of Lubbock and Dr. Enciso will speak on improved irrigation technologies and crop management," she said.

Other speakers include Erasmo Yarrito, the Rio Grande Watermaster team leader; Alan Moore, Cameron County Drainage District manager; and Charles Stichler, retired Extension agronomist.

This conference and trade show is the third of six scheduled events of the Irrigation Training Program, a collaborative effort among the Texas Water Resources Institute, AgriLife Extension, Texas State Soil and Water Conservation Board and the U.S.

Other Articles in this Category

- Treasury begins dishing out financial rescue funds
  1 hour 38 minutes ago
- Shoppe away: A new retailer opens its doors at the Shoppes at Rio Grande Valley
- International bridge a window to economic troubles
- Stocks dive on belief global recession is at hand
- Greenspan denies blame for crisis, admits 'flaw'

Most Viewed Stories

- Single mother gets by in faltering economy
- Matched arm first trace of missing Mission woman
- Leader of Tijuana-based drug cartel arrested
- Nearly half of Rio Grande Valley pregnancies unplanned, CDC study says
- A New Nightmare: Economic woes lead to harder times for Valley

Most Commented Stories

- Sharing the wealth: Ordinary Joes have mixed feelings on income redistribution
- A New Nightmare: Economic woes lead to harder times for Valley
- Donna steps up security amid rumors of gang threat
- Former DEA agent sentenced for breaking gun laws
- Judge's race heats up in waning days of campaign

Most Recommended Stories

- Gas Prices:
- Two Edinburg school district employees under investigation
- Crash leaves one band student dead, several others injured
- Police: 2 arrested in deadly Newark shootings
- International bridge a window to economic troubles

Save & Share this Article What is this?

Department of Agriculture's Natural Resources Conservation Service.

The Texas Water Development Board funds the project through its Agricultural Water Conservation Grant program, Wagner said.

"These events are held around the state to help growers and others learn about efficient tools and techniques of irrigation management," she said. "Each event offers region-specific information about irrigation practices, cropping systems, policy updates and cost-share programs available to local producers."

Agnews News & Public Affairs
A Service of Texas A&M AgriLife

Irrigation training program set for Gulf Coast

November 06, 2008
Writer(s): *Rod Santa Ana, 956-878-8317,r-santaana@tamu.edu*
Contact(s): *Cecilia Wagner, 979-458-1138, CAWagner@ag.tamu.edu*
Dr. Juan Landivar, 361-265-9201, JALandivar@ag.tamu.edu

CORPUS CHRISTI -- Coastal Bend growers will get to see for themselves the latest technologies in improved irrigation systems and their management at the upcoming Gulf Coast Irrigation Conference and Trade Show.

The event, sponsored by the Texas AgriLife Extension Service and others, will be held Nov. 18 at the San Patric County Fairgrounds and Civic Center at 219 5th St. in Sinton. Another sponsor is Texas AgriLife's Irrigation Technology Center.

The conference and trade show begins at 8:30 a.m. and concludes at 3 p.m.

"In these times of drought and the rising costs of farming, it's important to know about the many new technologie available to growers to help them save water, become more efficient and operate more profitably," said Dr. Juar Landivar, director of the Texas AgriLife Research and Extension Center in Corpus Christi.

Landivar will be the luncheon speaker and will address the potential of properly irrigated crops in the Coastal Be area.

Cecilia Wagner, a project manager at Texas A&M AgriLife's Texas Water Resource Institute, said irrigation and groundwater experts will present information on a variety of irrigation-related topics.

"They'll be sharing information on improving the efficiency of furrow irrigation and pumping systems, using soil moisture devices and evapotranspiration rates for crop management, and managing or reclaiming saline soils," she said.

In the afternoon session, representatives of the Texas Railroad Commission and the University of Texas Bureau of Economic Geology will present information on salt domes, oil brine contamination and Gulf Coast aquifer wat quality, Wagner said.

"This Gulf Coast event is the fourth of six irrigation program training events being held around the state to help growers learn about efficient tools and techniques of irrigation management," Wagner said.

Each event offers region-specific information about irrigation practices, cropping systems, policy updates and cost-sharing programs available to local producers, she said.

The next event is set for Jan. 14 in Amarillo. The final event, the South Texas Irrigation Conference, will be held Jan. 20 in Hondo.

Participants can receive two hours of certified crop-advisor or pesticide- applicator continuing education credits.

The Irrigation Training Program is a collaborative effort of Texas Water Resources Institute, AgriLife Extension,

Media Newswire
PRESS RELEASE DISTRIBUTION

Search

... where you read it first

Navigation

- Home
- Media Archives
- Submit Release
- Web Directory
- Privacy Policy
- Terms of Use
- About Us
- Contact Us
- XML Feeds

7th Space

Irrigation training program set for Gulf Coast

CORPUS CHRISTI -- Coastal Bend growers will get to see for themselves the latest technologies in improved irrigation systems and their management at the upcoming Gulf Coast Irrigation Conference and Trade Show. The event, sponsored by the Texas AgriLife Extension Service and others, will be held Nov. 18 at the San Patricio County Fairgrounds and Civic Center at 219 5th St. in Sinton. Another sponsor is Texas AgriLife's Irrigation Technology Center.

(Media-Newswire.com) - CORPUS CHRISTI -- Coastal Bend growers will get to see for themselves the latest technologies in improved irrigation systems and their management at the upcoming Gulf Coast Irrigation Conference and Trade Show.

The event, sponsored by the Texas AgriLife Extension Service and others, will be held Nov. 18 at the San Patricio County Fairgrounds and Civic Center at 219 5th St. in Sinton. Another sponsor is Texas AgriLife's Irrigation Technology Center.

The conference and trade show begins at 8:30 a.m. and concludes at 3 p.m.

"In these times of drought and the rising costs of farming, it's important to know about the many new technologies available to growers to help them save water, become more efficient and operate more profitably," said Dr. Juan Landivar, director of the Texas AgriLife Research and Extension Center in Corpus Christi.

Landivar will be the luncheon speaker and will address the potential of properly irrigated crops in the Coastal Bend area.

Cecilia Wagner, a project manager at Texas A&M AgriLife's Texas Water Resource Institute, said irrigation and groundwater experts will present information on a variety of irrigation-related topics.

"They'll be sharing information on improving the efficiency of furrow irrigation and pumping systems, using soil moisture devices and evapotranspiration rates for crop management, and managing or reclaiming saline soils," she said.

In the afternoon session, representatives of the Texas Railroad Commission and the University of Texas Bureau of Economic Geology will present information on salt domes, oil brine contamination and Gulf Coast aquifer water quality, Wagner said.

"This Gulf Coast event is the fourth of six irrigation program training events being held around the state to help growers learn about efficient tools and techniques of irrigation management," Wagner said.

Each event offers region-specific information about irrigation practices, cropping systems, policy updates and cost-sharing programs available to local producers, she said.

The next event is set for Jan. 14 in Amarillo. The final event, the South Texas Irrigation Conference, will be held Jan. 20 in Hondo.

Participants can receive two hours of certified crop-advisor or pesticide- applicator continuing education credits.

The Irrigation Training Program is a collaborative effort of Texas Water Resources Institute, AgriLife Extension, Texas State Soil and Water Conservation Board and the U.S. Department of Agriculture's Natural Resources Conservation Service.

The Texas Water Development Board funds the project through its Agriculture Water Conservation Grant program.

Registration is $15 in advance and $20 at the door. To register, contact Duane Campion at the AgriLife Extension office in Corpus Christi at 361-364-6234, or email DTCampion@ag.tamu.edu.

For more information about this event, visit http://itc.tamu.edu/conferences.php .

THE NUECES COUNTY RECORD STAR

Editorial Thursday, November 13, 2008

Farmers planting wheat should plan now

Print Page

By Jeffrey Stapper

Thursday, November 13, 2008 2:43 PM CST

Those producers that are planning to plant wheat could sure use some moisture as the top three inches of soil have really dried out over the last few weeks.

Spring wheat, best suited for the local area because of our lack of chill hours, should be planted from early December through mid-January at a seeding rate of about 90 pounds per acre.

Long range forecasts point to a dry winter in the Coastal Bend that does not bode well for winter crops like wheat. During the growing season, one inch of moisture will translate into about 3.5 bushels of wheat, so to produce a 30-bushel wheat crop we would need to receive 8.5-inches of rain or have that equivalent stored in the soil profile during the growing season.

High fertilizer costs have forced us to seriously evaluate what a crop actually needs and uses. In the case of wheat, the plant needs 1.5 pounds of nitrogen for each bushel produced, so a 30-bushel wheat crop would need 45 pounds of nitrogen.

With the drought of last spring, there could be some residual nitrogen left in the soil profile, but only soil testing would reveal that. Phosphorus, another important soil nutrient is used at about .77 pounds per bushel of wheat produced. Our soils are typically high in potassium, so that is not usually a concern.

I will be establishing a wheat variety test in the southern part of Nueces County this year to help evaluate which varieties are best suited to our area. Now all we need to hope for is that those wheat prices rebound to the levels that we saw this past spring and that we get some needed rainfall.

Irrigation Training Program set for Coastal Bend

Efficient irrigation systems and their operation and management along with information on local groundwater quality and salinity issues will be the spotlight of the Gulf Coast Irrigation Conference and Trade Show Nov. 18 in Sinton.

The conference and trade show is set for 8:30 a.m. to 3 p.m. at the San Patricio County Fairgrounds and Civic Center at 219 5th St. in Sinton.

Irrigation and groundwater experts will present information on improving the efficiency of furrow irrigation and pumping systems, using soil moisture devices and ET for crop management and managing or reclaiming saline soils. In the afternoon session, salt domes, oil brine contamination and gulf coast aquifer water quality will be discussed by representatives from the Railroad Commission and the Bureau of Economic Geology.

Juan Landivar, director of the Texas AgriLife Research and Extension Center in Corpus Christi, will discuss the potential of irrigation crops in the Coastal Bend as the keynote lunch speaker.

Registration is $15 in advance and $20 at the door. To register, contact Duane Campion, San Patricio County Extension office, at (361)-364-6234.

Participants can receive two hours of certified crop advisor or pesticide applicator continuing education credits.

The Gulf Coast event is the fourth of six ITP events being held around the state to help farmers and others learn about efficient tools and techniques of irrigation management. Each event will offer region-specific information about irrigation practices, cropping systems, policy updates and cost-share programs available to local producers. The next event is set for Jan. 14, 2009 in Amarillo, and the final event, the South Texas Irrigation Conference, will be Jan. 20, 2009 in Hondo.

These conferences are part of the Irrigation Training Program, a collaborative effort of TWRI, AgriLife Extension, Texas State Soil and Water Conservation Board, and USDA's Natural Resources Conservation Service. The Texas Water Development Board funds the project through its Agricultural Water Conservation Grant program.

Other sponsors of the Sinton event are Texas A&M AgriLife's Irrigation Technology Center.

For more information about the Coastal Bend conference, visit http://itc.tamu.edu/conferences.php.

Jeffrey Stapper is the Agricultural and Natural Resources Agent for Nueces County. Readers may contact him at (361) 767-5217.

Agnews News & Public Affairs
A Service of Texas A&M AgriLife

High Plains Irrigation Conference scheduled for Jan. 14

December 15, 2008
Writer(s): *Kay Ledbetter, 806-677-5600,SKledbetter@ag.tamu.edu*
Contact(s): *Nich Kenny, 806-677-5600, nkenny@ag.tamu.edu*

AMARILLO – With declines in water tables and increases in fuel costs, pumping water is taking a larger share of agricultural production budgets, according to a Texas AgriLife Extension Service specialist.

Producers can attend the annual High Plains Irrigation Conference and Trade Show on Jan. 14 at the Amarillo Civic Center, 401 S. Buchanan St., to get the latest information needed to help them maximize the irrigation water they pump, said Nich Kenny, AgriLife Extension irrigation specialist.

The meeting and trade show will begin with registration at 8 a.m. and close at 4 p.m. with the distribution of continuing education units. The trade show, sponsored by Texas Agriculture Irrigation Association and featuring the latest technology will stay open until 4:30 p.m.

The first educational session will be a technical look at the Ogallala Aquifer. Dr. Judy Reeves, Cirrus Associates LLC hydrogeologist, will present the history. Dr. Ken Rainwater, Texas Tech University's Water Resources Center director, and Dr. Kevin Mulligan, Center for Geospatial Technology director, will give updates on the current situation, and Dr. Robert Mace, Texas Water Development Board director of the groundwater resources, will discuss modeling the future.

The second session will look at issues impacting irrigation finances, with Kenny addressing pumping plant analysis and Dr. Steve Amosson, AgriLife Extension economist, talking about maximizing profits using limited water resources.

U.S. Department of Agriculture-Agricultural Research Service scientists, Drs. Paul Colaizzi, Steve Evett and Susan O'Shaughnessy, will talk about remote sensing for water management, soil water management for irrigation and automation of sprinkler systems in the third session.

The final session will include two topics of regional interest: virus effects on crop water use by Jacob Price, Texas AgriLife Research associate researcher, and the impact of dairies in the Texas High Plains by Dr. Todd Bilby, AgriLife Extension dairy specialist in Stephenville.

This year's conference is a part of the Irrigation Training Program, six programs being held around the state by the Texas Water Resources Institute to help farmers and others learn about efficient tools and techniques of irrigation management.

The Irrigation Training Program is a collaborative effort of the institute, AgriLife Extension, Texas State Soil and Water Conservation Board and the USDA's Natural Resources Conservation Service. Texas Water Development Board provides funding for the project through its Agricultural Water Conservation Grant program.

Two general continuing education units will be offered for pesticide applicators and five certified crop advisor credits will be given in soil and water management. The Irrigation Association has approved 4.5 continuing education units also.

A $15 registration fee will be charged at the door and will cover lunch. For more information, contact Kenny or Ronda Fisher at 806-677-5600.

Web Page Address: http://agnews.tamu.edu/showstory.php?id=887

Hutchinson County Highlights

P.O. Box 389, Borger, TX. 79008 Phone Judy or Don Allen, 806-674-6460; Nancy Young, 806-282-5936; Email: Editor@hutchinsoncountyhighlights.com or advertising@hutchinsoncountyhighlights.com; fax, 806-878-2552

Tuesday, DEC 16, 2008

High Plains Irrigation Conference scheduled for Jan. 14

AMARILLO – With declines in water tables and increases in fuel costs, pumping water is taking a larger share of agricultural production budgets, according to a Texas AgriLife Extension Service specialist.

Producers can attend the annual High Plains Irrigation Conference and Trade Show on Jan. 14 at the Amarillo Civic Center, 401 S. Buchanan St., to get the latest information needed to help them maximize the irrigation water they pump, said Nich Kenny, AgriLife Extension irrigation specialist.

The meeting and trade show will begin with registration at 8 a.m. and close at 4 p.m. with the distribution of continuing education units. The trade show, sponsored by Texas Agriculture Irrigation Association and featuring the latest technology will stay open until 4:30 p.m.

The first educational session will be a technical look at the Ogallala Aquifer. Dr. Judy Reeves, Cirrus Associates LLC hydrogeologist, will present the history. Dr. Ken Rainwater, Texas Tech University's Water Resources Center director, and Dr. Kevin Mulligan, Center for Geospatial Technology director, will give updates on the current situation, and Dr. Robert Mace, Texas Water Development Board director of the groundwater resources, will discuss modeling the future.

The second session will look at issues impacting irrigation finances, with Kenny addressing pumping plant analysis and Dr. Steve Amosson, AgriLife Extension economist, talking about maximizing profits using limited water resources.

U.S. Department of Agriculture-Agricultural Research Service scientists, Drs. Paul Colaizzi, Steve Evett and Susan O'Shaughnessy, will talk about remote sensing for water management, soil water management for irrigation and automation of sprinkler systems in the third session.

The final session will include two topics of regional interest: virus effects on crop water use by Jacob Price, Texas AgriLife Research associate researcher, and the impact of dairies in the Texas High Plains by Dr. Todd Bilby, AgriLife Extension dairy specialist in Stephenville.

This year's conference is a part of the Irrigation Training Program, six programs being held around the state by the Texas Water Resources Institute to help farmers and others learn about efficient tools and techniques of irrigation management.

The Irrigation Training Program is a collaborative effort of the institute, AgriLife Extension, Texas State Soil and Water Conservation Board and the USDA's Natural Resources Conservation Service. Texas Water Development Board provides funding for the project through its Agricultural Water Conservation Grant program.

Two general continuing education units will be offered for pesticide applicators and five certified crop advisor credits will be given in soil and water management. The Irrigation Association has approved 4.5 continuing education units also.

A $15 registration fee will be charged at the door and will cover lunch. For more information, contact Kenny or Ronda Fisher at 806-677-5600.

EMAIL THIS STORY PRINT THIS STORY

Today's Highlights

Front Page
- Beautiful cross greets visitors to Stinnett RV park
- Reception scheduled for Christine Lindsey
- Xcel Energy Foundation awards arts, environment grants

Arts and Entertainment
- Amarillo Art Institute Board Names New Executive Director

Borger Chamber of Commerce
- Business Spotlight
- Business Spotlight

Todays Events
- Tuesday, December 16, 2008

High Plains Irrigation Conference scheduled for Jan. 14

Dec 16, 2008 10:16 AM, By Kay Ledbetter
Texas A&M University

With declines in water tables and increases in fuel costs, pumping water is taking a larger share of agricultural production budgets, according to a Texas AgriLife Extension Service specialist.

Producers can attend the annual High Plains Irrigation Conference and Trade Show on Jan. 14 at the Amarillo Civic Center, 401 S. Buchanan St., to get the latest information needed to help them maximize the irrigation water they pump, said Nich Kenny, AgriLife Extension irrigation specialist.

The meeting and trade show will begin with registration at 8 a.m. and close at 4 p.m. with the distribution of continuing education units. The trade show, sponsored by Texas Agriculture Irrigation Association and featuring the latest technology will stay open until 4:30 p.m.

The first educational session will be a technical look at the Ogallala Aquifer. Dr. Judy Reeves, Cirrus Associates LLC hydrogeologist, will present the history. Dr. Ken Rainwater, Texas Tech University's Water Resources Center director, and Dr. Kevin Mulligan, Center for Geospatial Technology director, will give updates on the current situation, and Dr. Robert Mace, Texas Water Development Board director of the groundwater resources, will discuss modeling the future.

The second session will look at issues impacting irrigation finances, with Kenny addressing pumping plant analysis and Dr. Steve Amosson, AgriLife Extension economist, talking about maximizing profits using limited water resources.

U.S. Department of Agriculture-Agricultural Research Service scientists, Drs. Paul Colaizzi, Steve Evett and Susan O'Shaughnessy, will talk about remote sensing for water management, soil water management for irrigation and automation of sprinkler systems in the third session.

The final session will include two topics of regional interest: virus effects on crop water use by Jacob Price, Texas AgriLife Research associate researcher, and the impact of dairies in the Texas High Plains by Dr. Todd Bilby, AgriLife Extension dairy specialist in Stephenville.

This year's conference is a part of the Irrigation Training Program, six programs being held around the state by the Texas Water Resources Institute to help farmers and others learn about efficient tools and techniques of irrigation management.

The Irrigation Training Program is a collaborative effort of the institute, AgriLife Extension, Texas State Soil and Water Conservation Board and the USDA's Natural Resources Conservation Service. Texas Water Development Board provides funding for the project through its Agricultural Water Conservation Grant program.

Two general continuing education units will be offered for pesticide applicators and five certified crop advisor credits will be given in soil and water management. The Irrigation Association has approved 4.5 continuing education units also.

A $15 registration fee will be charged at the door and will cover lunch. For more information, contact Kenny or Ronda Fisher at 806-677-5600.

Find this article at:
http://www.southwestfarmpress.com/events/irrigation-conference-1215/index.html

High Plains Observer Perryton
Bringing You The News While It's Still The News
hpoperryton@live.com

Gina Gillispie, Editor*806-659-5341*Julie Corbin-Hulsey, Perryton Editor*806-228-1010

CLASSIFIED ADVERTISING | QUORUM FORUM MEETING NOTES | SUBMISSION FORMS FOR ARTICLES & ADS | KXDJ FM 98 CLASSIFIED ADS NEW

Wednesday, DEC 17, 2008

RANGER POWER SPIRIT ADS NEW

Ranger Power Ads
$25.00 Per Quarter
Buy one today!

ADVERTISE ON HPO
- HPO Spearman
- HPO Dumas-Sunray
- Panhandle Shield
- Advertising Rates
- Yellow Pages NEW
- Just Who Are We

NEWS
- Front Page
- Page 2 News
- Agriculture
- Coffee Shop
- Financial Markets
- National Columns
- Obituaries
- Oil and Gas
- Opinions
- Politics
- Sports

LIFE MATTERS
- Announcements
- Babies
- Brides
- Church
- Daily Devotional
- Holistic Healing NEW
- Parties and Showers
- Photo Gallery
- Weddings
- Salute Our Troops

REAL ESTATE
- Century 21

FUN! FUN! FUN!
- Arts
- Crack of Dawn
- Embrace The Grace
- Entertainment
- Restaurant Guide
- Wine 101

High Plains Irrigation Conference scheduled for Jan. 14

Kay Ledbetter, 806-677-5600,SKledbetter@ag.tamu.edu
Contact(s):Nich Kenny, 806-677-5600, nkenny@ag.tamu.edu

AMARILLO – With declines in water tables and increases in fuel costs, pumping water is taking a larger share of agricultural production budgets, according to a Texas AgriLife Extension Service specialist.

Producers can attend the annual High Plains Irrigation Conference and Trade Show on Jan. 14 at the Amarillo Civic Center, 401 S. Buchanan St., to get the latest information needed to help them maximize the irrigation water they pump, said Nich Kenny, AgriLife Extension irrigation specialist.

The meeting and trade show will begin with registration at 8 a.m. and close at 4 p.m. with the distribution of continuing education units. The trade show, sponsored by Texas Agriculture Irrigation Association and featuring the latest technology will stay open until 4:30 p.m.

The first educational session will be a technical look at the Ogallala Aquifer. Dr. Judy Reeves, Cirrus Associates LLC hydrogeologist, will present the history. Dr. Ken Rainwater, Texas Tech University's Water Resources Center director, and Dr. Kevin Mulligan, Center for Geospatial Technology director, will give updates on the current situation, and Dr. Robert Mace, Texas Water Development Board director of the groundwater resources, will discuss modeling the future.

The second session will look at issues impacting irrigation finances, with Kenny addressing pumping plant analysis and Dr. Steve Amosson, AgriLife Extension economist, talking about maximizing profits using limited water resources.

U.S. Department of Agriculture-Agricultural Research Service scientists, Drs. Paul Colaizzi, Steve Evett and Susan O'Shaughnessy, will talk about remote sensing for water management, soil water management for irrigation and automation of sprinkler systems in the third session.

The final session will include two topics of regional interest: virus effects on crop water use by Jacob Price, Texas AgriLife Research associate researcher, and the impact of dairies in the Texas High Plains by Dr. Todd Bilby, AgriLife Extension dairy specialist in Stephenville.

This year's conference is a part of the Irrigation Training Program, six programs being held around the state by the Texas Water Resources Institute to help farmers and others learn about efficient tools and techniques of irrigation management.

The Irrigation Training Program is a collaborative effort of the institute, AgriLife Extension, Texas State Soil and Water Conservation Board and the USDA's Natural Resources Conservation Service. Texas Water Development Board provides funding for the project through its Agricultural Water Conservation Grant program.

Two general continuing education units will be offered for pesticide applicators and five certified crop advisor credits will be given in soil and water management. The Irrigation Association has approved 4.5 continuing education units also.

A $15 registration fee will be charged at the door and will cover lunch. For more information, contact Kenny or Ronda Fisher at 806-677-5600.

Current Highlights
Front Page
- House Fire the Latest Hardship for Local Family
- Perryton Ochiltree County Chamber of Commerce Hosts Christmas Open House
- Mission Messiah: A New Creation
- Ochiltree County Jail Report

Page 2 News
- We Don't Talk Good

Sports
- Nominations Sought for Texas Fishing Hall of Fame

Daily Devotional
- Personal God

KXDJ EVENTS CALENDAR
- Chris and Ken 12/17/08
- Congressman Mac Thornberry's Latest Thoughts on the Auto Industry Bailout
- Wayne Hughes of the PPROA Thought's on the Patch Prospects for 2009

Farm Briefs

Publication Date: 12/21/08

Water resource conference

The High Plains Irrigation Conference and Trade Show, from 8 a.m. to 4 p.m. on Jan. 14, will offer several sessions on issues affecting producers facing declining water tables and increased pumping costs.

Texas AgriLife Extension will host the conference at the Amarillo Civic Center. Continuing education units will be available.

Some of the topics to be discussed include a technical look at the state of the Ogallala Aquifer, financial aspects of irrigation and remote sensing for water management including automation of sprinkler systems. Closing the day will be a session on viruses' effects on water use and the impact of dairies on water supply.

There will be a $15 registration fee which will also cover lunch. For more information, call 806-677-5600.

Agnews News & Public Affairs
A Service of Texas A&M AgriLife

Comprehensive irrigation training program offered Jan. 20 in Hondo

December 12, 2008
Writer(s): *Paul Schattenberg, 210-467-6575,paschattenberg@ag.tamu.edu*
Contact(s): *Dr. Guy Fipps, 979-845-7454, g-fipps@tamu.edu*

HONDO - The Texas Water Resources Institute and the Texas AgriLife Extension Service will co-sponsor the South Texas Irrigation Conference and Trade Show on Jan. 20 at the Medina County Fair Hall, Farm-to-Market Road 462 in Hondo.

The key activity at the conference is an irrigation training program to take place from 8:30 a.m. to 4 p.m.

“At the conference, irrigation experts will provide information useful to growers in the region, including irrigation system technologies and how to operate and manage them,” said Dr. Guy Fipps, AgriLife Extension agricultural engineer and program coordinator. “The goal of the training is to help growers and others improve their overall irrigation management and efficiency, and reduce costs.”

In addition to efficient irrigation practices, the program will cover cropping systems, pumping plant efficiency, irrigation economics and water marketing, Fipps said. It also will include workshops on drip and pivot irrigation systems.

An optional session on pesticide laws and regulations will be presented from 3-4 p.m. for attendees seeking continuing education units.

Additional conference sponsors include regional groundwater conservation districts, the Edwards Aquifer Authority and the Irrigation Technology Center.

A trade show sponsored by the Texas Agricultural Irrigation Association is being held as part of the conference. Registration forms for the trade show are posted at http://itc.tamu.edu .

Conference registration is $15 in advance and $20 at the door.

For more information and to pre-register, contact the AgriLife Extension office for Medina County at 830-741-6180. For additional information on the Irrigation Training Program, visit http://twri.tamu.edu/project-info/ITP/ .

The Hondo program is one of six irrigation training programs presented throughout the state by the institute and its partners as part of the collaborative Irrigation Training Program. Program participants include the institute, AgriLife Extension, Texas State Soil and Water Conservation Board, and the U.S. Department of Agriculture's Natural Resources Conservation Service. Funding for training is provided through the Texas Water Development Board.

Web Page Address: http://agnews.tamu.edu/showstory.php?id=878

Comprehensive irrigation training program offered Jan. 20 in Hondo

Texas

The Texas Water Resources Institute and the Texas AgriLife Extension Service will co-sponsor the South Texas Irrigation Conference and Trade Show on Jan. 20 at the Medina County Fair Hall, Farm-to-Market Road 462 in Hondo.

The key activity at the conference is an irrigation training program to take place from 8:30 a.m. to 4 p.m.

"At the conference, irrigation experts will provide information useful to growers in the region, including irrigation system technologies and how to operate and manage them," said Dr. Guy Fipps, AgriLife Extension agricultural engineer and program coordinator. "The goal of the training is to help growers and others improve their overall irrigation management and efficiency, and reduce costs."

In addition to efficient irrigation practices, the program will cover cropping systems, pumping plant efficiency, irrigation economics and water marketing, Fipps said. It also will include workshops on drip and pivot irrigation systems.

An optional session on pesticide laws and regulations will be presented from 3 to 4 p.m. for attendees seeking continuing education units.

Additional conference sponsors include regional groundwater conservation districts, the Edwards Aquifer Authority and the Irrigation Technology Center.

A trade show sponsored by the Texas Agricultural Irrigation Association is being held as part of the conference. Registration forms for the trade show are posted at http://itc.tamu.edu.

Conference registration is $15 in advance and $20 at the door.

For more information and to pre-register, contact the AgriLife Extension office for Medina County at 830-741-6180. For additional information on the Irrigation Training Program, visit http://twri.tamu.edu/project-info/ITP/ .

The Hondo program is one of six irrigation training programs presented throughout the state by the institute and its partners as part of the collaborative Irrigation Training Program. Program participants include the institute, AgriLife Extension, Texas State Soil and Water Conservation Board, and the U.S. Department of Agriculture's Natural Resources Conservation Service. Funding for training is provided through the Texas Water Development Board.

12/22/08
5 Star OK\10-B

Date: 12/18/08

Latest Ag News

- BSE Timeline
- Kub's Den - Oilseeds

Irrigation Training Program Conference Agenda

Agenda

Lubbock, Texas
February 1, 2008

Making The Most of Irrigation
February 1, 2008

9:15-9:30 am	Registration	
9:30	Welcome and Introductions ***Mark Brown**, CEA-Agriculture, Lubbock County*	
9:30 10:15	Crop Water Use, Irrigation Scheduling (Evapotranspiration (ET), Soil Moisture Management and Other Tools) ***Dana Porter**, Extension Agricultural Engineer at Lubbock*	
10:15-10:45	Economics of Rotation Strategies for Water Conservation ***Jay Yates**, Extension Risk Management Specialist at Lubbock*	
10:45 -11:00	Cost-share Programs Update ***Randy Underwood**, NRCS at Lubbock*	
11:00- 11:30	Legislative Update Regarding Water Issues ***Jim Conkwright**, General Manager - High Plains Underground Water Conservation District*	
11:30-11:50	Overview of Information Resources & Introduction to afternoon breakout session topics. ***Mark Brown and Dana Porter***	
Noon	Lunch On Your Own *(available at the Southwest Farm and Ranch Classic Trade Show area)*	
1:15 - 2:45 p.m. Concurrent Sessions	Room 107 Applications of center pivot irrigation technologies: LEPA, LESA, MESA, LPIC (Trouble-shooting, maintenance, management, new developments) **Edwin Smith** *and* **Farris Hightower**, *Texas Agricultural Irrigation Association)*	Room 104 Applications of microirrigation technologies: Subsurface Drip Irrigation (Trouble-shooting, maintenance, management, new developments) ***Jerry Funck,** Texas Agricultural Irrigation Association*
2:45	Break & Rotation	
3:00 - 4:00	Optimum management of Forage and Grain Crops ***Calvin Trostle**, Extension Agronomist at Lubbock*	Optimum management of Cotton. ***Randy Boman**, Extension Cotton Agronomist at Lubbock*
4:00 - 4:15	Wrap-up, discussion, and evaluation; CEUs distributed.	

Agenda

Chillicothe, Texas
August 19, 2008

8:00 – 8:30	Registration
8:30 – 8:40	Welcome and Introductions *John Sij*
8:40 – 8:50	Overview of Information Resources *Dana Porter, Extension Agricultural Engineer at Lubbock*
8:50 – 9:15	Soil Moisture Management, ET networks and Other Tools *Dana Porter, Extension Agricultural Engineer at Lubbock*
9:15 – 9:45	Cost-Share Update - EQIP Program; Water Quality Management Plan Program Overview *Reggie Quiett, NRCS District Conservationist* *Judy Albus, TSSWCB*
9:45 – 10:00	Break
10:00 – 10:30	Legislative Update Regarding Water Issues *Jack Campsey, Gateway Goundwater Conservation District* *Mike McGuire, Rolling Plains Groundwater Conservation District*
10:30- 11:00	Water Quality Considerations *Paul DeLaune, AgriLife Research Environmental Soil Scientist*
11:00 – 11:30	Irrigation Management and Timing *Robert Lemon, Extension Agronomist*
11:30 – 12:15	Applications of center pivot & micro-irrigation technologies: *Cy McGuire, Eco-drip* *Andy Brumley, Waggoner and Son Electric, Inc*
12:15 – 1:15	Lunch On Site
1:30 – 2:30	Center Pivot irrigation demonstration in the field *Andy Brumley, Waggoner and Son Electric, Inc* *Producer Discussion*
2:30	Break & Move to next site
2:30 – 3:30	Microirrigation (drip irrigation) demonstration in the field *Cy McGuire, Eco-drip* *Producer Discussion*

7th Rio Grande Valley Irrigation Conference and Trade Show

Mercedes, Texas
October 29, 2008

7:30 am **Trade Show & Registration Opens -** *Breakfast Tacos served in Trade Show area*

8:30 am **Updates and Status Reports**

Current Water Supply Situation - Forecast for the 2009 Season
Erasmo Yarrito, Rio Grande Watermaster Team Leader, Harlingen
EQIP Program
Dwight Head, NRCS Engineer, Corpus Christi

9:00 am **On-Farm Irrigation Session I**

Improved Irrigation Technologies - Selection, Benefits and Costs
Dr. Guy Fipps, Extension Agricultural Engineer, College Station
Maximizing the Efficiency of Furrow Irrigation
Alan Moore, former NRCS Engineer, Manager, Cameron Drainage District, Harlingen
Measuring Soil Moisture, Metering and Using ET for Crop Management
Dr. Dana Porter, Extension Agricultural Engineer, Lubbock

10:00 am **Break** - *refreshments in the Trade Show area*

10:30 am **On-Farm Irrigation Session II**

Agronomic Considerations in Irrigation Management
Charles Stichler, Extension Agronomist (retired), Knippa
Fertigation
Dr. Juan Enciso, Extension Agricultural Engineer, Weslaco
Recycling Irrigation Plastics
Jonathan Diaz, TCEQ, Harlingen Regional Office

12:00 Noon **Lunch** - *J.D. Salinas, County Judge, Hidalgo County*

1:30 pm **Irrigation District Forum - Experiences in Irrigation District Rehabilitation and Modernization**

Evaluation of canal lining projects
Dr. Guy Fipps, Extension Agricultural Engineer, College Station
Askar Karimov, Extension Associate, Biological and Agricultural Engineering
Sonny Hinojosa, Manager Hidalgo County Irrigation District No. 2
District Panel – Telemetry, remote control and automation
Harlingen Irrigation District
Hidalgo Irrigation District No. 6
United Irrigation District

Sponsors: *Texas Water Development Board, Texas AgriLife Extension Service, LRGV Water District Managers Association, Irrigation Technology Center, Texas State Soil and Water Conservation Board, USDA-Natural Resource Conservation Service, Texas Water Resources Institute*

7th Rio Grande Valley Conferencia sobre Irrigación y exhibiciones comerciales

Mercedes, Texas
October 29, 2008

7:30 am **Apertura del área de exhibición de negocios, Registro -** *Tacos para desayunar se servirán en el área de exhibición de negocios*

8:30 am **Actualización y Reportes**

Situación actual del suministro de agua - Pronostico para la temporada del 2009
Erasmo Yarrito, Rio Grande Watermaster Team Leader, Harlingen
EQIP Program
Dwight Head, NRCS Engineer, Corpus Christi

9:00 am **Sección I Riego parcelario**

Tecnologías de Riego Mejoradas - Selección, Beneficios y Costos
Dr. Guy Fipps, Extension Agricultural Engineer, College Station
Maximizando la Eficiencia de Riego por Surcos
Alan Moore, former NRCS Engineer, Manager, Cameron Drainage District, Harlingen
Medición de la humedad del suelo, Medición y uso de Evapotranspiración para el Manejo de los Cultivos
Dr. Dana Porter, Extension Agricultural Engineer, Lubbock

10:00 am **Receso -** *bebidas en el area de exhibición*

10:30 am **Sección II Riego Parcelario**

Consideraciones Agronómicas en Manejo del Riego
Charles Stichler, Extension Agronomist (retired), Knippa
Fatigación
Dr. Juan Enciso, Extension Agricultural Engineer, Weslaco
Reciclamiento de los plásticos del riego
Jonathan Diaz, TCEQ, Harlingen Regional Office

12:00 Noon **Comida** - *J.D. Salinas, County Judge, Hidalgo County*

1:30 pm **Foro sobre Distritos de Riego- Experiencias en Rehabilitación y Modernización de Distritos de Riego**

Evaluación de revestimiento de canales
Dr. Guy Fipps, Extension Agricultural Engineer, College Station
Askar Karimov, Extension Associate, Biological and Agricultural Engineering
Sonny Hinojosa, Manager Hidalgo County Irrigation District No. 2
Panel de Distritos – Telemetría, control remoto y automatización
Harlingen Irrigation District
Hidalgo Irrigation District No. 6
United Irrigation District

Patrocinado por: *Texas Water Development Board, Texas AgriLife Extension Service, LRGV Water District Managers Association, Irrigation Technology Center, Texas State Soil and Water Conservation Board, USDA-Natural Resource Conservation Service, Texas Water Resources Institute*

Trade Show Exhibitors

Texas Agricultural Irrigation Association

Precise Power Corporation

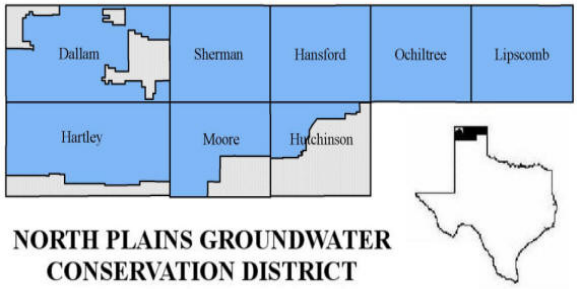
High Plains Underground Water Conservation District No. 1 — Texas — 1951

LINDSAY Corporation

Equipment Supply Co., Inc.

valmont

GPM



North Plains Groundwater Conservation District

FARM Assistance
Planning Solutions

High Plains Groundwater Consultants

SIDES Electric Irrigation

WM Watermaster Irrigation Supply Inc.

Panhandle Groundwater District
"Conserving Water for Future Generations"

Diversity D Inc.
Specializing in Drip Irrigation

T-L Irrigation Company

Senninger Irrigation Inc.

TEXAS A&M AgriLIFE

Teaching • Research • Extension • Service

HIGH PLAINS IRRIGATION CONFERENCE & TRADE SHOW

Program & Agenda

Irrigation Training Program

Funded by the

Texas Water Development Board

High Plains Irrigation Conference Agenda

8:50 am	**Welcome by Leonard Haynes: Donley Co. Extension Agent**
	Session #1 Technical Look at the Ogallala Aquifer *Moderator: J.R. Sprague, Lipscomb County Extension Agent*
9:00 am	**History of the Ogallala Aquifer** *Dr. Judy Reeves*
9:30 am	**Current State of the Ogallala Aquifer** *Dr. Ken Rainwater* *Dr. Kevin Mulligan*
10:00 am	**Modeling of the Ogallala Aquifer** *Dr. Robert Mace*
10:30 am	**Q&A/Break - Sponsored by Senninger Irrigation**
	Session #2 Impacting Irrigation Finances *Moderator: Nick Simpson, Dallam & Hartley Co. Extension Agent*
11:00 am	**Pumping Plant Analysis** *Nich Kenny*
11:30 am	**Maximizing Profits under Limited Water** *Dr. Steve Amosson*
12 Noon	**Lunch – Sponsored by TAIA**
	Session #3 Application of Irrigation Technology *Moderator: Scott Strawn, Potter County Extension Agent*
1:00 pm	**Remote Sensing for Water Management** *Dr. Paul Colaizzi*
1:30 pm	**Soil Water Management for Irrigation** *Dr. Steve Evett*
2:00 pm	**Automation of Sprinkler Systems** *Dr. Susan O'Shaughnessy*
2:30 pm	**Q&A / Break - Sponsored by Valmont Industries, Inc.**
	Session #4 Two Topics of Regional Interest *Moderator: Scott Strawn, Potter County Extension Agent*
3:00 pm	**Virus Effects on Crop Water Use** *Jacob A. Price*
3:30 pm	**Impact of Dairies in Texas High Plains** *Dr. Todd Bilby*
4:00 pm	**Closing comments / CEU's / Trade Show**

**** **Please Complete and Submit Survey** ****

Featured Speakers

Dr. Judy Reeves
Senior Hydrogeologist, Cirrus Associates, LLC.

Dr. Ken Rainwater
Director, Water Resources Center at Texas Tech University

Dr. Kevin Mulligan
Center for Geospatial Technology

Dr. Robert Mace
Texas Water Development Board

Nich Kenny
Irrigation Specialist, Texas AgriLife Extension Service - Amarillo

Dr. Steve Amosson
Economist, Texas AgriLife Extension Service - Amarillo

Dr. Paul Colaizzi
USDA-ARS: Bushland, Texas

Dr. Steve Evett
USDA-ARS: Bushland, Texas

Dr. Susan O'Shaughnessy
USDA-ARS: Bushland, Texas

Jacob A. Price
Plant Pathology Research Associate: Texas AgriLife Research

Dr. Todd Bilby
Dairy Specialist, Texas AgriLife Extension Service-Stephenville

Conference & Trade Show Sponsors

Texas Water Development Board
Texas AgriLife Extension Service
Texas Water Resources Institute
Texas Agricultural Irrigation Association
Texas State Soil and Water Conservation Board
USDA-Natural Resources Conservation Service

Gulf Coast Irrigation Conference and Trade Show

Sinton, Texas
November 18, 2008

8:00 am **Trade Show & Registration Opens**

8:30 am **Updates**

Regional Water Planning Group
Charles Ring, Region 14 Water Planning Group
Groundwater Districts
Dr. Lynn Drawe, Chairman San Patricio Groundwater Conservation District
NRCS - EQIP program
Leroy Wolff, NRCS Director San Patricio County Office

9:00 am **Session I - Irrigation Systems**

Maximizing the efficiency of Furrow/Flood Irrigation
Alan Moore, former NRCS Engineer, Manager, Cameron Drainage District, Harlingen
Pumping plant efficiency: matching pumps to irrigation systems to reduce fuel costs
Nich Kenny, Extension Program Specialist, Amarillo

10:00 am **Break**

10:30 am **Session II - Irrigation System Operation and Management**

Management of Center Pivot and Linear Move Irrigation Systems
Dr. Guy Fipps, Professor & Extension Agricultural Engineer
Soil moisture devices, metering and ET for crop management
Charles Stichler, Extension Agronomist (retired), Knippa
Irrigation salinity management and reclamation of saline soils
Dr. Tony Provin, Texas A&M Soil, Water & Forage Testing Lab

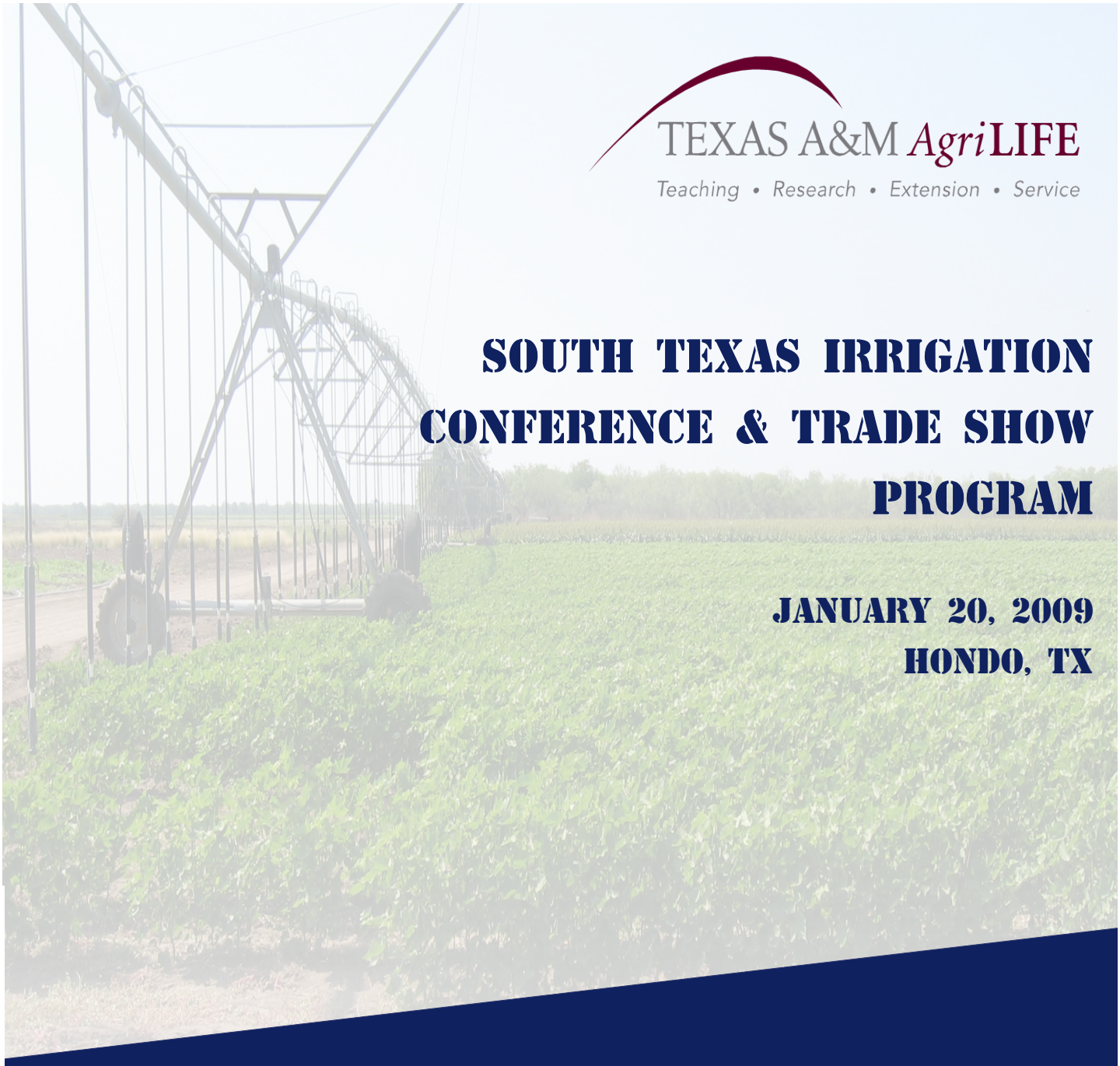
12:00 Noon **Lunch**

Potential of Irrigated Crops in Coastal Bend
Dr. Juan Landivar, Director Texas AgriLife Research & Extension Center, Corpus Christi

1:00 pm **Session III - Groundwater and Wells**

Gulf Coast Aquifer, Salt Domes and Water Quality
Scott Hamlin, Bureau of Economic Geology
Programs to address Oil Brine Contamination and Concerns
Dr. Heidi Bojes & Bill Renfro, Texas Railroad Commission
Well Completion Methods
James Pawlik, James Pawlik Well Services

Sponsors: *Texas Water Development Board, Texas AgriLife Extension Service, Irrigation Technology Center, Texas State Soil and Water Conservation Board, USDA-Natural Resources Conservation Service, Texas Water Resources Institute*



TEXAS A&M AgriLIFE

Teaching • Research • Extension • Service

SOUTH TEXAS IRRIGATION CONFERENCE & TRADE SHOW PROGRAM

JANUARY 20, 2009
HONDO, TX

Irrigation Training Program

Funded by the
Texas Water Development Board

South Texas Irrigation Conference Agenda

8:30 - 9:45 a.m. **Session I**

Crop Water Usage, Fertilizer Uptake and Crop Physiology
Charles Stichler

Improved Irrigation Technologies: Selection, Benefits, and Costs
Guy Fipps

9:45 - 10:15 a.m. **Break:** Refreshments in Trade Show Area

10:15 - 11:30 a.m. **Session II**

Pumping Plant Efficiency: Matching Pumps to Irrigation Systems to Reduce Fuel Costs
Nich Kenny

Irrigation Economics and Water Markets
Steve Amosson

11:30 - 12:10 p.m. **Updates**

EQIP Program
William Durham

Groundwater Districts
Luana Buchner
Vic Hilderbran

Edward Aquifer Authority
Velma Danielson

TWDB Water Conservation Projects and Programs
Aung Hla

12:10 - 1:15 p.m. **Lunch** – Included with Registration Fee - **Russ Johnson, Water Law Attorney**

1:15 - 2:45 p.m. **Session III Concurrent Workshops**

Drip Irrigation—Design and Management Considerations: the California Perspective
Blaine Hanson

The South Texas Perspective
Larry Stein

Center Pivot Irrigation: Ten Frequently Asked Questions about Pivots
Guy Fipps

Center Pivot Successes and Challenges: the Kansas Perspective
Danny Rogers

New Developments in Water Applicators and Pivot Technology
TBA

2:45 - 3:00 p.m. **Break**

3:00 - 4:00 p.m. **Optional Session: Pesticide Laws and Regulations**

Featured Speakers

Dr. Steve Amosson
Economist, Texas AgriLife Extension Service, Amarillo

Luana Buchner
General Manger, Medina County Groundwater Conservation District

Velma Danielson
General Manager, Edwards Aquifer Authority

William Durham
NRCS Team Leader, District Conservationist

Dr. Guy Fipps
Director, Irrigation Technology Center, Professor & Extension Agricultural Engineer, College Station

Dr. Blaine Hanson
Irrigation Specialist, University of California - Davis

Vic Hilderbran
General Manager, Uvalde County Groundwater Conservation District

Aung Hla
Agricultural Water Conservation Officer, Texas Water Development Board

Nich Kenny
Irrigation Specialist, Texas AgriLife Extension Service, Amarillo

Dr. Charles Stichler
Professor and Extension Agronomist, (retired), Knippe

Dr. Danny Rogers
Extension Engineer, Kansas State University

Dr. Larry Stein
Professor and Extension Horticulturist, Texas AgriLife Extension Service, Uvalde

Conference & Trade Show Sponsors

Evergreen Groundwater Conservation District, Medina County Groundwater Conservation District, Uvalde County Groundwater Conservation District, Edwards Aquifer Authority, Texas Agricultural Irrigation Association, Irrigation Technology Center, Texas AgriLife Extension Service, Texas Water Resources Institute, Texas Water Development Board, Texas State Soil & Water Conservation Board

*** ***Please Complete and Submit Survey*** ***

ITP Conference Evaluation Results

Southern High Plains Evaluation Results

Activity Title: Making the Most of Irrigation (Lubbock)
Activity Date: February 1, 2008
Activity Description: Education and Training

*9 evaluations returned from 43 participants (21% overall response).

Understanding Level		Poor	Fair	Good	Excellent	Before Program	After Program	Percent Change
Rank		1	2	3	4			
Crop water requirements	Water requirements by growth stage (such as crop Evapotranspiration)					2.56 (9)	3.22 (9)	25.78
	Peak water use					2.56 (9)	3.11 (9)	21.48
	Drought sensitivity by growth stage					2.44 (9)	3.0 (9)	22.95
	Seasonal water use by crop					2.44 (9)	3.11 (9)	27.46
	Irrigation Scheduling Using ET Network					2.44 (9)	3.56 (9)	45.90
Soil moisture management	Soil moisture storage capacity by soil type					2.44 (9)	3.67 (9)	50.41
	Estimating soil moisture (soil moisture measurement or monitoring)					2.11 (9)	3.22 (9)	52.61
	Root zone (depth by crop, limiting factors, etc.)					2.33 (9)	3.56 (9)	52.79
Irrigation efficiency and economics	2008 Irrigation Economics Decisions					2.0 (9)	3.11 (9)	55.5
	Available Cost-Share Programs					2.0 (9)	3.33 (9)	66.5
	Legislative Issues regarding water					1.89 (9)	3.11 (9)	64.55
	Water Use Efficiency (yield per water input)					2.63 (8)	3.13 (8)	19.01
	Irrigation Economics: Value of irrigation ($ return/ac-in or $ return/pumping cost)					2.63 (8)	3.125 (8)	18.82
Overview of Information Resources	ET Network and Growers Guide					2.25 (8)	3.63 (8)	49.33
	2007 Cotton Resource DVD and Publications					2.0 (8)	3.5 (8)	75.00
	eXtension web site					1.89 (8)	3.5 (8)	85.19

Will the information provided in this program be helpful in your 2008 irrigation decisions?
YES 9 (100%)

Based on today's program, do you plan to implement any changes in your irrigation practices?
YES 9 (100%)

What was the most significant or helpful topic addressed in this program?

- *"Having more information to use."*
- *"Very good session. Much was a review, but reviews are good. Resource material is superb. Thanks."*
- *"Equipment."*
- *"Budget for crop systems".*

* 6 responses from 35 participants (17% overall response).

Technology or practice		Definitely not adopt	Probably will not adopt	Undecided	Probably will adopt	Definitely will adopt	Adopted already
Applications of center pivot irrigation technologies	Low energy precision application (LEPA)	1 (16.7%)					2 (33.3%)
	Low elevation spray application (LESA)	1 (16.7%)					2 (33.3%)
	Low pressure in-canopy (LPIC)	1 (16.7%)					2 (33.3%)
	New Developments				1 (16.7%)		2 (33.3%)
Application of microirrigation	Subsurface drip irrigation (SDI)					4 (66.7%)	2 (33.3%)
	New Developments					3 (50%)	2 (33.3%)
Equipment maintenance or diagnostics to ensure a high level of irrigation system performance and efficiency	Trouble-shooting				1 (16.7%)	3 (50%)	2 (33.3%)
	Scheduled Maintenance				1 (16.7%)	3 (50%)	2 (33.3%)
	Flow meters/ Pressure gauges			1 (16.7%)	1 (16.7%)	3 (50%)	1 (16.7%)
	Monitoring fuel/ energy usage			2 (33.3%)		3 (50%)	
	Distribution uniformity test			1 (16.7%)		4 (66.7%)	
Best Management Practices (BMPs) to improve high irrigation efficiency	Irrigation Scheduling (using evapotranspiration, soil moisture indicators, or plant indicators.)			1 (16.7%)		4 (66.7%)	1 (16.7%)
	Furrow diking			2 (33.3%)		2 (33.3%)	2 (33.3%)
	Drought tolerant crops/varieties, etc			1 (16.7%)	1 (16.7%)	3 (50%)	1 (16.7%)
	Conservation tillage, etc.				2 (33.3%)	2 (33.3%)	2 (33.3%)
	Water-efficient cropping practices					4 (66.7%)	2 (33.3%)

Approximately how many irrigated acres do you manage?

5 responses. Total acres=12,340; Average per response=2,468 acres.

Summary:

A total of 43 participants attended the morning session, and 35 participants attended the afternoon session. As a result of the conference, the participants responding to an evaluation (21% response) indicated that 100 percent of them considered the information useful for the 2008 crop year. Participants indicated that they increased their knowledge of crop water requirements; soil moisture management; irrigation efficiency and economics; and information resources available. Respondents indicated that the average acreage they managed was 2,468 acres. If this number were applied to all participants, the total acreage managed by all conference participants exceeded an estimated 106,000 acres. Overall, 100 percent of respondents plan to implement changes in irrigation practices based on conference information. Finally, producers indicated intent to adopt various practices ranging from subsurface drip irrigation (66%) to conservation tillage (33%).

Rolling Plains Evaluation Results

Activity Title: Chillicothe ITP
Activity Date: August 19, 2008
Activity Description: Education and Training

Rank level of understanding based on the following ranking scale:

Level of Understanding	Poor	Fair	Good	Excellent
Ranking	1	2	3	4

*25 evaluations returned from 41 participants (61% overall response)

What is your level of understanding of each of the following items?	**Before Program**	**After Program**	**Percent Change**
Crop water requirements	2.56	3.36	31.25
Soil moisture Management	2.08	3.32	59.61
Center pivot irrigation (applicability to your operation, management, maintenance, etc.)	2.20	3.04	38.18
Subsurface drip irrigation (applicability to your operation, management, maintenance, etc	1.84	3.20	73.91
Irrigation BMPs (such as irrigation system management or irrigation scheduling) to improve water use efficiency	2.20	3.28	49.09
Irrigation information resources available	2.20	3.44	56.36

Will the information presented in this program help you to:
Conserve Water? *YES 25 (100%)*
Increase profitability (increase yield/improve crop quality)? *YES 25 (100%)*
Increase water use efficiency? *YES 25 (100%)*

What is your primary occupation?
12 Agriculture Producer 1 Crop Consultant 0 Extension Service
2 Irrigation dealer/manufacturer representative/technical service provider
8 State or Federal agency or local district (Groundwater District)
1 Other Retired NRCS 2 no answer

How many acres do you manage?

Range	30-23000 Total Acres	20-3000 Irrigated Acres
Total	40,432 Total Acres	8240 Irrigated Acres
Average/response	3113 Acres	634 Irrigated Acres

What topics on today's program is (are) most valuable to you?

- Drip Irrigation and SDI Operations
- Center Pivots
- Crop requirements and Water Efficiency

What topic(s) should have been addressed (or addressed more thoroughly)?

- Energy cost (fuel/acre)
- Legislative updates
- ET & Scheduling
- Pest control on drip irrigation
- Soil moisture management

*14 responses from 41 participants on all categories except for Low Pressure Center Pivot (34% response rate)

*12 responses from 41 participants on Low Pressure Center Pivot (29% response rate)

Technology or practice	Definitely will not adopt	Probably will not adopt	Undecided	Probably will adopt	Definitely will adopt	Adopted already
Irrigation scheduling (such as evapotranspiration or soil moisture monitoring)			1 (7.1%)	7 (50%)	2 (14.2%)	4 (28.5%)
Low pressure center pivot (or linear) irrigation -LEPA, LESA, LPIC or MESA		2 (16.6%)	3 (25%)	2 (16.7%)	1 (8.3%)	4 (33.3%)
Microirrigation (including subsurface drip irrigation)			3 (21.4%)	5 (35.7%)	1 (7.2%)	5 (35.7%)
Equipment maintenance or diagnostics to ensure a high level of irrigation system performance and efficiency			1 (7.1%)	7 (50%)	1 (7.2%)	5 (35.7%)
Best Management Practices (BMPs) to improve high irrigation efficiency			1 (7.1%)	5 (35.7%)	2 (14.3%)	6 (42.8 %)

Summary:

A total of 41 participants attended the conference. Based on the percentage of producers that completed the survey (12 out of 25), it is estimated that 19 of the 41 participants were agriculture producers. As a result of the meeting, the participants responding to an evaluation (61 percent response) indicated that 100 percent of them considered the information useful for the 2008 crop year. Participants indicated that they increased their knowledge of crop water requirements (31%); soil moisture management (60%); center pivot irrigation systems (38%); subsurface drip irrigation systems (74%); irrigation best management practices to improve water use efficiency (49%); and information resources available (56%). Respondents indicated that the average acreage they managed was 3,113 acres with an average 634 of those acres being irrigated. If this number were applied to all producers who participated, the total acreage managed by all conference participants exceeded an estimated 59,147 acres, of which an average 12,046 acres would be irrigated. Overall, 100 percent of respondents anticipate benefiting economically and increasing profitability as a direct result of what they learned from the conference. And, 100 percent of the respondents indicated an increase in water use efficiency and the ability to conserve water as a result of the ITP conference. Finally, producers indicated intent to adopt various practices ranging from subsurface drip irrigation (7%) to better irrigation scheduling (14%).

Rio Grande Valley Evaluation Results

Activity Title: ITP Mercedes
Activity Date: October 29, 2008
Activity Description: Education and Training

Number of Participants: 150
Percentages based on 55 respondents to the survey (Response rate = 37%).

Overall:

- 98% of respondents were mostly or completely satisfied with the activity.

Content:

- 96% of respondents were mostly or completely satisfied with the information being what they expected.
- 96% of respondents were mostly or completely satisfied with the information being accurate.
- 91% of respondents were mostly or completely satisfied with the information being easy to understand.
- 94% of respondents were mostly or completely satisfied with the completeness of information given on each topic.
- 98% of respondents were mostly or completely satisfied with the timeliness of information given on each topic.
- 90% of respondents were mostly or completely satisfied with the helpfulness of the information in decisions about your own situation.
- 100% of respondents were mostly or completely satisfied with the quality of course materials.
- 90% of respondents were mostly or completely satisfied with the relevance of the examples used.

Instructor(s):

- 100% of respondents were mostly or completely satisfied with the instructor's knowledge level on the subject.
- 96% of respondents were mostly or completely satisfied with the instructor's speaking / presentation abilities.
- 96% of respondents were mostly or completely satisfied with the instructor's organization / preparedness.
- 100% of respondents were mostly or completely satisfied with the instructor responses to student questions.

Facilities:

- 92% of respondents were mostly or completely satisfied with the physical setting's contribution to ease of listening and participation.

Anticipated Changes & Economic Impact:

- 52% of respondents plan to take actions or make changes based on the information from this activity.
- 78% of respondents anticipate benefiting economically as a direct result of what they learned from this Extension activity.

Value of Activity:

- 96% of respondents said that the information and programs provided by Extension were quite or extremely valuable to them.
- 100% of respondents would recommend this activity to others.
- 98% of respondents would attend another subject offered by Extension if it addressed a specific need or interest of theirs.

Demographics of Participants:

- 4% female
  96% male
- 0% Black
  68% Hispanic
  30% White
  2% Other
- 6% under age 30
  48% ages 30 to 49
  42% ages 50 to 69
  4% age 70 or older

Level of Understanding: (% of respondents who increased their understanding of)

- (53%) – ET
- (59%) – Soil Moisture Management and Metering
- (60%) – Irrigation Technology Selection
- (60%) – Furrow Irigation
- (74%) – Fertigation
- (86%) – Recycling of Ag Plastics
- (69%) – Current Water Supply Situation
- (72%) – Irrigation information resources available

What is your primary occupation?

37 Agriculture Producer 3 Crop Consultant 11 Extension Service
15 Irrigation dealer/manufacturer representative/technical service provider
16 State or Federal agency or local district (Irrigation District) 9 Other

How many acres do you manage?

Range	10-5,250 Total Acres	10-5,250 Irrigated Acres
Total	31,872 Total Acres	25,857 Irrigated Acres
Average/response	937 Acres	761 Irrigated Acres

Summary:

A total of 150 participants attended the conference. Based on the percentage of producers that completed the survey (37 out of 55), it is estimated that 100 of the 150 participants were agriculture producers. As a result of the meeting, the participants responding to an evaluation (37 percent response) indicated that 98 percent of them considered the information useful for the upcoming 2009 crop year. Participants indicated that they increased their knowledge of evapotranspiration (ET) (53%); soil moisture management and metering (59%); irrigation technology selection (60%); furrow irrigation systems (60%); fertigation (74%), recycling of agricultural plastics (86%), current water supply situation (69%) and the irrigation information resources available (72%). Respondents indicated that the average acreage they managed was 937 acres with 761 of those acres being irrigated on average. If this number were applied to all producers who participated, the total acreage managed by all conference participants exceeded an estimated 93,741 acres, of which an average 76,050 acres would be irrigated. Overall, 52 percent of respondents plan to take actions or make changes based on conference information and 78 percent of respondents anticipate benefiting economically as a direct result of what they learned from the conference.

Coastal Bend Evaluation Results

Activity Title: ITP Sinton
Activity Date: November 18, 2008
Activity Description: Outreach and Training

Number of Participants: 37
Percentages based on 13 respondents to the survey (Response rate = 35%).

Overall:

- 91% of respondents were mostly or completely satisfied with the activity.

Content:

- 69% of respondents were mostly or completely satisfied with the information being what they expected.
- 85% of respondents were mostly or completely satisfied with the information being accurate.
- 69% of respondents were mostly or completely satisfied with the information being easy to understand.
- 75% of respondents were mostly or completely satisfied with the completeness of information given on each topic.
- 67% of respondents were mostly or completely satisfied with the timeliness of information given on each topic.
- 67% of respondents were mostly or completely satisfied with the helpfulness of the information in decisions about your own situation.
- 92% of respondents were mostly or completely satisfied with the quality of course materials.
- 54% of respondents were mostly or completely satisfied with the relevance of the examples used.

Instructor(s):

- 100% of respondents were mostly or completely satisfied with the instructor's knowledge level on the subject.
- 77% of respondents were mostly or completely satisfied with the instructor's speaking / presentation abilities.
- 100% of respondents were mostly or completely satisfied with the instructor's organization / preparedness.
- 83% of respondents were mostly or completely satisfied with the instructor responses to student questions.

Facilities:

- 85% of respondents were mostly or completely satisfied with the physical setting's contribution to ease of listening and participation.

Anticipated Changes & Economic Impact:

- 50% of respondents plan to take actions or make changes based on the information from this activity.
- 58% of respondents anticipate benefiting economically as a direct result of what they learned from this Extension activity.

Value of Activity:

- 85% of respondents said that the information and programs provided by Extension were quite or extremely valuable to them.
- 92% of respondents would recommend this activity to others.
- 100% of respondents would attend another subject offered by Extension if it addressed a specific need or interest of theirs.

Demographics of Participants:

- 8% female
  92% male
- 0% Black
  8% Hispanic
  84% White
  8% Other
- 8% under age 30
  31% ages 30 to 49
  46% ages 50 to 69
  15% age 70 or older

Level of Understanding: (% of respondents who increased their understanding of)

- (18%) – Current Water Supply.
- (70%) – Flood/Furrow Irrigation.
- (55%) – Pumping Plant Efficiency.
- (36%) – Center Pivot Irrigation Systems.
- (43%) – Soil Moisture Management & Metering.
- (64%) – Salinity Management.
- (57%) – Oil Brine Concerns.

Will you increase your water use efficiency based on this program?

YES 6 (46%) *NO 0 (0%)* *Undecided 7 (54%)*

What is your primary occupation?

6 Agriculture Producer 0 Crop Consultant 1 Extension Service
4 Irrigation dealer/manufacturer representative/technical service provider
2 State or Federal agency or local district (Irrigation District) 0 Other

How many acres do you manage?

Total	11,928 Total Acres	1,760 Irrigated Acres
Average/response	917 Acres	135 Irrigated Acres

Summary:

A total of 37 participants attended the conference. Based on the percentage of producers that completed the survey (6 out of 13), it is estimated that 17 of the 37 participants were agriculture producers. As a result of the meeting, the participants responding to an evaluation (35 percent response) indicated that 91 percent of them considered the information useful for the upcoming 2009 crop year. Participants indicated that they increased their knowledge of current water supply (18%), soil moisture management and metering (43%); pumping plant efficiency (55%); flood and furrow irrigation systems (70%); center pivot irrigation systems (36%), salinity management (64%) and oil brine concerns (57%). Respondents indicated that the average acreage they managed was 917 acres with 135 of those acres being irrigated on average. If this number were applied to all producers who participated, the total acreage managed by all conference participants exceeded an estimated 15,589 acres, of which an average 2,295 acres would be irrigated. Overall, 50 percent of respondents plan to take actions or make changes based on conference information and 58 percent of respondents anticipate benefiting economically as a direct result of what they learned from the conference. Finally, 46 percent of the respondents indicated an increase in water use efficiency, while 54 percent were undecided.

Northern High Plains Results

Activity Title: HPIC 2009
Activity Date: January 14, 2009
Activity Description: Outreach and Education

Number of Participants: 133
Percentages based on 62 respondents to the survey (Response rate = 47%).

Overall:

- 84% of respondents were mostly or completely satisfied with the activity.

Content:

- 79% of respondents were mostly or completely satisfied with the information being what they expected.
- 95% of respondents were mostly or completely satisfied with the information being accurate.
- 69% of respondents were mostly or completely satisfied with the information being easy to understand.
- 85% of respondents were mostly or completely satisfied with the completeness of information given on each topic.
- 80% of respondents were mostly or completely satisfied with the timeliness of information given on each topic.
- 67% of respondents were mostly or completely satisfied with the helpfulness of the information in decisions about your own situation.
- 84% of respondents were mostly or completely satisfied with the quality of course materials.
- 77% of respondents were mostly or completely satisfied with the relevance of the examples used.

Instructor(s):

- 97% of respondents were mostly or completely satisfied with the instructor's knowledge level on the subject.
- 89% of respondents were mostly or completely satisfied with the instructor's speaking / presentation abilities.
- 97% of respondents were mostly or completely satisfied with the instructor's organization / preparedness.
- 98% of respondents were mostly or completely satisfied with the instructor responses to student questions.

Facilities:

- 74% of respondents were mostly or completely satisfied with the physical setting's contribution to ease of listening and participation.

Anticipated Changes & Economic Impact:

- 46% of respondents plan to take actions or make changes based on the information from this activity.
- 53% of respondents anticipate benefiting economically as a direct result of what they learned from this Extension activity.

Value of Activity:

- 81% of respondents said that the information and programs provided by Extension were quite or extremely valuable to them.
- 91% of respondents would recommend this activity to others.
- 100% of respondents would attend another subject offered by Extension if it addressed a specific need or interest of theirs.

Demographics of Participants:

- 11% female
  89% male
- 0% Black
  3% Hispanic
  95% White
  2% Other
- 13% under age 30
  30% ages 30 to 49
  50% ages 50 to 69
  7% age 70 or older

Level of Understanding: (% of respondents who increased their understanding of)

- (79%) – The History and Current Conditions of the Ogallala Aquifer.
- (74%) – The Methods used to model the Ogallala Aquifer.
- (68%) – Factors that contribute to Pumping Plant Efficiency.
- (52%) – Managing limited water for Maximum Profit.
- (54%) – Remote Sensing and Automation of Irrigation Systems.
- (51%) – Soil Measuring Devices and Methods.
- (62%) – The Management of Irrigation Water in Virus Effected Crops.
- (76%) – The Water use Impact of Dairies in the Texas High Plains.

Will you increase your water use efficiency based on this program?

YES 29 (46%) *NO 12 (20%)* *Did not Answer 21 (34%)*

What is your primary occupation?

20 Agriculture Producer 4 Crop Consultant 2 Extension Service
2 Irrigation dealer/manufacturer representative/technical service provider
23 State or Federal agency or local district (Irrigation District) 4 Other (Engine Distributor, 2X fertilizer/ seed dealer)

How many acres do you manage?

Range	160-25,000 Total Acres	0-20,000 Irrigated Acres
Total	105,880 Total Acres	89,920 Irrigated Acres
Average/response	4,603 Acres	4,146 Irrigated Acres

Summary:

A total of 133 participants attended the workshop. Based on the percentage of producers that completed the survey (20 out of 62), it is estimated that 43 of the 133 participants were agriculture producers. As a result of the meeting, the participants responding to an evaluation (47 percent response) indicated that 84 percent of them considered the information useful for the upcoming 2009 crop year. Participants indicated that they increased their knowledge of current and historic conditions of the Ogallala aquifer (79%); modeling methods in the Ogallala aquifer (74%), factors contributing to pumping plant efficiency (68%), maximizing profit by managing limited water (52%), remote sensing and automated irrigation systems (54%), soil moisture measuring devices and methods (51%), managing irrigation in virus effected crops (62%), and the impact of water use by dairies in the area (76%). Respondents indicated that the average acreage they managed was 4,603 acres with 4,146 of those acres being irrigated on average. If this number were applied to all producers who participated, the total acreage managed by all conference participants exceeded an estimated 197,929 acres, of which an average 178,278 acres would be irrigated. Overall, 46 percent of respondents plan to take actions or make changes based on conference information and 53 percent of respondents anticipate benefiting economically as a direct result of what they learned from the conference. Finally, 46 percent of the respondents indicated an increase in water use efficiency, while 34 percent were undecided.

South Texas Evaluation Results

Activity Title: ITP Hondo
Activity Date: January 20, 2009
Activity Description: Education and Training

Number of Participants: 128
Percentages based on 65 respondents to the survey (Response rate = 51%).

Overall:

- 85% of respondents were mostly or completely satisfied with the activity.

Content:

- 87% of respondents were mostly or completely satisfied with the information being what they expected.
- 88% of respondents were mostly or completely satisfied with the information being accurate.
- 89% of respondents were mostly or completely satisfied with the information being easy to understand.
- 75% of respondents were mostly or completely satisfied with the completeness of information given on each topic.
- 85% of respondents were mostly or completely satisfied with the timeliness of information given on each topic.
- 84% of respondents were mostly or completely satisfied with the helpfulness of the information in decisions about your own situation.
- 92% of respondents were mostly or completely satisfied with the quality of course materials.
- 85% of respondents were mostly or completely satisfied with the relevance of the examples used.

Instructor(s):

- 97% of respondents were mostly or completely satisfied with the instructor's knowledge level on the subject.
- 84% of respondents were mostly or completely satisfied with the instructor's speaking / presentation abilities.
- 92% of respondents were mostly or completely satisfied with the instructor's organization / preparedness.
- 92% of respondents were mostly or completely satisfied with the instructor responses to student questions.

Facilities:

- 69% of respondents were mostly or completely satisfied with the physical setting's contribution to ease of listening and participation.

Anticipated Changes & Economic Impact:

- 56% of respondents plan to take actions or make changes based on the information from this activity.
- 71% of respondents anticipate benefiting economically as a direct result of what they learned from this Extension activity.

Value of Activity:

- 77% of respondents said that the information and programs provided by Extension were quite or extremely valuable to them.
- 98% of respondents would recommend this activity to others.
- 100% of respondents would attend another subject offered by Extension if it addressed a specific need or interest of theirs.

Demographics of Participants:

- 3% female
  97% male
- 0% Black
  5% Hispanic
  90% White
  5% Other
- 6% under age 30
  21% ages 30 to 49
  55% ages 50 to 69
  18% age 70 or older

Level of Understanding: (% of respondents who increased their understanding of)

- (68%) – Crop Water Usage & Fertilizer Uptake.
- (65%) – Benefits of Irrigation Technology.
- (70%) – Pumping Plants.
- (60%) – Irrigation Economics.
- (59%) – Drip Irrigation.
- (64%) – Center Pivot Irrigation.
- (74%) – Current Water Issues.

Will you increase your water use efficiency based on this program?

YES 53 (85%) *NO 2 (3%)* *Did not Answer 7 (11%)*

What is your primary occupation?

49 Agriculture Producer 0 Crop Consultant 0 Extension Service
1 Irrigation dealer/manufacturer representative/technical service provider
3 State or Federal agency or local district (Irrigation District) 9 Other

How many acres do you manage?

Range	10-50,000 Total Acres	0-6,000 Irrigated Acres
Total	118,403 Total Acres	26,834 Irrigated Acres
Average/response	2,153 Acres	488 Irrigated Acres

Summary:

A total of 128 participants attended the conference. Based on the percentage of producers that completed the survey (49 out of 65), it is estimated that 96 of the 128 participants were agriculture producers. As a result of the meeting, the participants responding to an evaluation (37 percent response) indicated that 85 percent of them considered the information useful for the upcoming 2009 crop year. Participants indicated that they increased their knowledge of crop water use and fertilizer update (68%); benefits of irrigation technology (65%), pumping plant efficiency (70%), irrigation economics (60%), drip irrigation (59%), center pivot irrigation (64%) and current water issues (74%). Respondents indicated that the average acreage they managed was 2,153 acres with 488 of those acres being irrigated on average. If this number were applied to all producers who participated, the total acreage managed by all conference participants exceeded an estimated 206,688 acres, of which an average 46,848 acres would be irrigated. Overall, 56 percent of respondents plan to take actions or make changes based on conference information and 71 percent of respondents anticipate benefiting economically as a direct result of what they learned from the conference. Finally, 85 percent of the respondents indicated an increase in water use efficiency, while only 11 percent were undecided.

Executive Administrator Draft Report Comments
Contractor Response to Comments

REQUIRED CHANGES

General Draft Final Report Comments:

1. Please proofread the report before submitting, looking for spelling and grammatical errors.
   Final report document was proofread and minor additions or edits were made throughout the document in spelling and grammar instances that were in addition to the comments/errors noted below.

SUGGESTED CHANGES

General Draft Final Report Comments:

2. Page 7: Sentence fragment (comma misplaced): "The Irrigation Training Program, funded by the Texas Water Development Board (TWDB) through an Agricultural Water Conservation Grant began, in 2006." *This should read: "The Irrigation Training Program, funded by the Texas Water Development Board (TWDB) through an Agricultural Water Conservation Grant, began in 2006."*
   Addressed and corrected.

3. Page 7: Misspelled Word: United Stated should read *United States.*
   Addressed and corrected.

4. Page 8: Suggested grammar: "The Irrigation Training Manual was published just in time for the first irrigation conference scheduled in year two." *This may read: "The Irrigation Training Manual was published just in time for the first irrigation conference scheduled in 2007.*
   Addressed and corrected; however, correction was made to say 2008 as this was when the first irrigation conference was scheduled.

5. Page 9: Wrong word used: "Extension often lead the conferences by arranging logistics such as facility planning." *This should read: "Extension often led the conferences by arranging logistics such as facility planning."*
   Addressed and corrected.

6. Page 9: Suggested Grammar: "The primary audience included agricultural producers, but County Extension Agents, SWCD personnel, crop consultants and other individuals attended and received information on improving irrigation management skills." *This may read: "The primary audience included agricultural producers, County Extension Agents. SWCD personnel. crop consultants and other individuals who received information on improving irrigation management skills. " .*
   Addressed and corrected.

7. Page 11: Please state source of statistic (State Water Plan) " ... as the agriculture industry is expected to reduce its consumption of irrigation water by 16 percent over the next fifty years."
   Addressed and corrected.

8. Page 14: Please add article in the beginning of this sentence. *"The* TSSWCB helped local Extension personnel to reserve facilities, provide refreshments, handle reservations and arrange other necessary supportive functions such as a translator at the Rio Grande Conference.
   Addressed and corrected.

9. Page l5: Again, please add an article at the beginning of the sentence. *"The* TSSWCB also served as the liaison ..." "While *the* TSSWCB served a supportive function ..." "Therefore, *the* TSSWCB requested to dissolve their subcontract ..." *This occurs many more times, please adjust if you except the suggestion.
   Addressed and corrected.

10. Page 16: Please use upper case letters: • "TSSWCB has been working with NRCS to arrange for a speaker at the *Coastal Bend* event."
    Addressed and corrected.

11. Page 25: Recommend taking out "*Unmistakably"* and *"After all"* at the beginning of sentences.
    Addressed and corrected.

12. Page 29: Add article before ITP please. "Through planned, region-specific training conferences, *the* ITP was able to provide locally applicable irrigation water management training to irrigation farmers, consultants, educators and agency personnel in Texas while relying on the core and fundamental information provided in the ITP manual."
    Addressed and corrected.

13. Page 30: Grammar "First, timing of the irrigation conference *was* imperative". OR "First, timing of *an* irrigation conference is imperative."
    Addressed and corrected.

14. Page 30: Grammar: "Most producers can *do* late fall or late winter depending on their location in the state and therefore, these times tend to be more popular for producer education." *Please replace with "attend in "*
    Addressed and corrected.

15. Page 30: Grammar: Suggestion to take out italicized. "While efforts are made to cover all of the topics needed, it is also important to realize that producers are not going to give more than a day or two, *at best."*
    Addressed and corrected.

16. Page 31: Cite reference. Please site the *"16 percent over the next 50 years"* again.
    Addressed and corrected.

17. Page 32: Sentence revision. Please consider revising the following sentence: "As stated by TWDB personnel, Robert Mace..." To *"As stated by the TWDB Deputy Executive Administrator of Water Science and Conservation, Robert Mace ... "*
    Addressed and corrected.

18. Page 32: Capitalization requested: "For example, subsurface drip irrigation (SDI) in the Rolling Plains area is not the prominent form of irrigation."
    Addressed and corrected.

19. Page 33: Grammar "The need for NRCS and TSSWCB to provide cost-share programs and the need for Extension to provide education related to the cost-share programs was also expressed by ITP trainers. " *Suggestion: "The needs for NRCS and TSSWCB to provide cost-share programs and for Extension to provide education related to the cost-share programs were also expressed by ITP trainers. "*
Addressed and corrected.

20. Page 34: Sentence fragment. Please place a period in the last sentence under the first paragraph "ITP Conference Planning".
Addressed and corrected.

21. Page 35: Spelling. Chillicothe is misspelled in the six locations.
Addressed and corrected.

22. Page 35: Map of locations. Please move the text up on the map to place the dot on Potter County for Amarillo.
Addressed and corrected.

23. Page 36: Spelling. Chillicothe is misspelled.
Addressed and corrected.

24. Page 36: Credits. Please label "copy services" as "TAMU Copy Services", or "AgriLife Copy Services".
Addressed and corrected.

25. Page 36: Capitalization. "International" does not need to be proper in this format.
Addressed and corrected.

26. Page 37: Spelling. Table 10. Mercedes is spelled wrong.
Addressed and corrected.

27. Page 37: Spelling. The agenda, included in Appendix E, included an afternoon field day to a local *producer's* center pivot system ..."
Addressed and corrected.

28. Page 38: Sentence fragment (clause). Please place a comma after 2008. "The Rio Grande Valley (Mercedes) conference, held on October 29, 2008, ..."
Addressed and corrected.

29. Page 38: Sentence revision. "Producers learned about water conservation and using their irrigation systems most efficiently." Please consider: *"Producers learned about water conservation and managing their irrigation systems more efficiently"*
Addressed and corrected.

30. Page 38: Sentence fragment (clause). Please place a comma after 2008. "The Coastal Bend irrigation conference, located in Sinton and held on November 18, 2008,..."
Addressed and corrected.

31. Page 38. Please spell out the Bureau of Economic Geology before the acronym "BEG".
Addressed and corrected.

32. Page 38. Please spell out evapotranspiration before "ET".
Addressed and corrected.

33. Page 38. Please take out italicized: "The Northern High Plains irrigation conference *was* Amarillo event was held on January 14, 2009 at the Amarillo Civic Center."
Addressed and corrected.

34. Page 39: Revision of sentence: "This conference, also promoted as both a trade show and educational meeting, focused on regional issues such as the state of the Ogallala Aquifer and the impact of dairies on water use and water quality in the High Plains." *TO: "This conference, also promoted as both a trade show and educational meeting, focused on regional issues such as the state of the Ogallala Aquifer, the impact of dairies on water use, 'and the water quality in the Texas High Plains."*
Addressed and corrected.

35. Page 39: Please consider replacing the word "dubbed" or possibly taking out "also dubbed a conference and trade show".
Addressed and corrected.

36. Page 39: Please consider revising the run-on sentence. "While each conference contained a local spin, all of the events included programs on crop water use, cost-share programs to enhance current irrigation systems, an update from the local water agency, whether that be an irrigation district or a groundwater district, maintenance and operation of irrigation systems and economics or irrigation and production."
Addressed and corrected.

37. Page 40: Word change "Given the Lubbock event was first, project personnel learned several lessons from the event and *assessed* impacts from it."
Addressed and corrected.

38. Page 40: Word change: "And finally, a breakdown of total acreage compared to *irrigated* acreage was an additional question added to the future surveys."
Addressed and corrected.

39. Page 41: Word change "In addition to participant occupation, Extension also asked attendees to provide the acreage they manage as well as the amount of irrigated *acreage* managed."
Addressed and corrected.

40. Page 41: 'Please delete italicized. "TWRI assessed *TWRI assessed* total savings ...."
Addressed and corrected.

41. Page 42, 43, 44, and 45: suggestion: word change "If this number were applied to all." To "If this number *was* applied to all ... "
Addressed and corrected.

42. Page 43: word change "Participants indicated that they increased their knowledge ... " To: "Participants indicated that *the conference* increased their knowledge ..."
Addressed and corrected.

43. Page 43. Numbers: May want to write again "assuming the estimated 100 of 150 participants" "4,260 acres with 4,102 of those acres..." "426,000 acres, of which an average 410,200 acres ... "
Numbers were adjusted per the justification following the next comment (#44).

44. Page 43. So, these 100 farmers manage 91 % of all irrigated acreage in Region M? The TWDB estimates in 2007 shows Region M had a total of 449,039 irrigated acreage. There may be a need to try and separate out the acreage by Texas farms and Mexico farms.
Original estimates in draft final report as well as the 2009 water savings report inadvertently included values reported by irrigation district managers who attended the irrigation conference. When polled about the number of acres managed, the irrigation district managers reported total acreage within an irrigation district rather than an individual farm. These values of 20,000, 45,000 and 65,000 erroneously inflated the total acreage reported to be farmed and irrigated by conference participants, which lead to the inaccurate estimate listed in the draft report as well as the 2009 water savings report. Removing these values from the totals, the average acreage managed is reduced to 937 with 761 being the average irrigated acreage. Therefore, these new, revised numbers were used to calculate the impact of the Rio Grande conference as well as the water savings from this conference.

45. Page 47: Sentence revision: "And as the lead institute ... " *"As* the lead institute ... "
Addressed and corrected.

46. Page 51: Capitalize: Please capitalize "Table" for Table 13 within the text.
Addressed and corrected.

47. Page 51 & 52: The budgeted amounts may be updated. As of now payment 12 has been the latest processed, but if there is more recent activity please update to October 2009.
Addressed and corrected.

48. Pages 52 & 53: Annual water savings: Please include a discussion within each region in section 3 of report. Please list/cite your sources on where these estimates came from.
Addressed and corrected.

49. Page 56: Again, please revise: *"As stated by the TWDB Deputy Executive Administrator of Water Science and Conservation, Robert Mace ... "*
Addressed and corrected.

50. Page 57: Please change Agricultural Water Conservation Division to "Agricultural Water Conservation *Section* ".
Addressed and corrected.

51. Page 57: Please add within text: "Current members of the group are *Comer Tuck (Director),* Aung Hla (Team Lead)
Addressed and corrected.

52. Please add more information on the new website.
All presentations and information received to date have been posted on the Irrigation Training Website (http://irrigationtraining.tamu.edu/index.html). Additionally, the manuals are completely updated and all links are active and working on the site for both the North Texas and South Texas editions.