



## The Irrigation Technology Center

Vision and Concept



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## A vision of Public Service

The vision of the Irrigation Technology Center (ITC) is to establish a world class, state-of-the-art facility for education, testing and applied research, to promote efficient irrigation, water conservation, profitable agricultural production, and quality urban landscapes.

ITC has four primary missions: develop design and performance standards for agricultural and landscape irrigation systems, establish an equipment testing and certification program, provide training and educational services for irrigators, agency and industry personnel, and develop new and improved irrigation technologies, methods, and management practices.

## Finding solutions through education , testing and applied research .

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Due to the growing world population and industrial development, our need and use of fresh water continues to increase, and regional water shortages are expected to become prevalent in the coming years. In Texas, as well as many other regions, irrigation is the single largest user of freshwater. Significant water savings in irrigation are being sought to help meet this growing need for water.

Achieving real water savings in irrigation is a difficult and complex task since both technology and human behavior are involved. It will require today's best expertise to realize the full benefits of existing technologies, develop more efficient irrigation products, methods and management strategies, and educate both agricultural and landscape irrigators on their use.

In addition, the agricultural and landscape irrigation industries are largely unregulated. Equipment manufactures and retailers often make claims regarding the efficiency and performance of their equipment without adequate testing. No independent design standards exist for irrigation systems and most consumers do not have the expertise to determine if the systems they are purchasing will perform as claimed.



## Major Divisions of the Irrigation Technology Center

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Urban Programs Division

Agricultural Programs Division

Testing and Certification Division

Wastewater Reuse Division

International Division

### Urban Programs Division

The Urban Programs Division will consist of residential-scale and commercial landscape irrigation systems to provide hands-on instruction, testing and performance evaluations, and applied research. Systems will include fully automated and manually controlled drip, sprinkler and microspray irrigation of various plant materials. Training programs will include:

- Drip irrigation technology and management
- Irrigation system auditing and water budgeting
- Scientific scheduling methods
- Soil moisture measurement and technologies
- Weather station operation and maintenance
- Gray water and other alternative sources for landscape irrigation
- System selection, performance and operation
- Zoned sprinkler irrigation design
- Water reuse





## Agricultural Programs Division

The Agricultural Programs Division will consist of true-scale, operating agricultural irrigation systems of all major technologies including drip, sprinkler and furrow irrigation. These facilities will allow for side-by-side comparisons, hands-on instruction, testing, performance evaluations, and applied research. Training programs will include:

- Irrigation system selection, design, operation and management
- Irrigation pumping plant design, installation and efficiency testing
- Proper installation of flow meters, weirs and other flow measurement devices
- ET (evapotranspiration) for determining crop water requirements
- Irrigation scheduling based on soil moisture, plant indicators, and other methods
- Wastewater reuse





## Testing and Certification Division

The Irrigation Technology Center will test and certify the performance of both landscape and agricultural irrigation equipment, including laboratory testing of components and field testing of complete systems. The certification program will provide irrigators, lenders and regulators, assurance that systems and components purchased will perform as advertised. Effects of wind, soils, landscape area, plant types, and other environmental factors will be determined in detail, thereby allowing for the development of design standards to improve efficiency.

- Four indoor testing laboratories and additional outdoor testing facilities are planned which will provide the Irrigation Technology Center with capabilities unsurpassed anywhere in the world.
- A modern hydraulics laboratory will be used for testing pumps, meters, backflow prevention devices, and other irrigation system components.

- Two irrigation testing buildings will be constructed; one will be a controlled environment, and the other will be designed to determine the effects of wind on distribution patterns and application efficiency.
- A semi-open drip tubing test facility will, among other capabilities, allow for measurement of distribution uniformity of long laterals.
- Outdoor facilities and state-of-the-art test equipment will be used for evaluating whole irrigation systems to determine performance, benefits, longevity of components, and design standards.



### Wastewater Reuse Division

The Wastewater Reuse Division will conduct training and applied research on the special nature of wastewater reuse, including water quality issues, plant response, system design requirements, corrosion, environmental quality, and recommended management practices. The division will coordinate wastewater reuse research and demonstration projects with university researchers, utilities, industry, and public agencies. The Irrigation Technology Center's unique facilities will allow detailed evaluation of design and component selection issues. Long-term irrigation of crops and landscapes will demonstrate the benefits and effectiveness of wastewater reuse to the public.





### International Division

The International Division will be self-supporting through funding provided from industry, international organizations and foreign governments. The International Division will provide training of individuals, industry and governmental personnel, and will support international irrigation education and technology transfer programs.



### Equipment Testing and Certification Program

Testing of irrigation components and systems will be conducted under laboratory and real-world operating environments. Equipment will be certified as having passed specific performance standards. The hydraulics lab will allow for independent verification of the accuracy and durability of flow meters, backflow devices, valves, pumps, etc. All major water application devices will be tested including sprinklers, surge flow valves, gated pipe, drip, and microsprays.

### Design and Performance Standards for Agricultural and Landscape Irrigation Systems

The effectiveness of irrigation systems is impacted by many factors including sizing of pipelines and components, pressures, water flow and quality, environmental conditions, and installation procedures. The longevity of whole systems is influenced by the quality of individual components and maintenance. Good performance is achieved by the integration and consideration of all these factors. The Irrigation Technology Center will develop efficiency design and performance standards for agricultural and landscape irrigation systems under real world operating conditions. The hydraulics lab will allow for the development of flow meter installation procedures to ensure accurate measurements, and for proper pump selection and installation to decrease energy use.

### Training and Educational Services

Structured training and short course programs, publications, software and Internet resources will be developed for farm workers, growers, landowners, public officials, and industry personnel on irrigation tech-

nologies, water management strategies, water reuse, and other topics. Regional and state educational events including field days, seminars and walking tours, will be conducted in cooperation with municipalities, utilities, industry and agency groups, and educational institutions.

### Research and Information Systems

The Irrigation Technology Center will coordinate with industry and other researchers on the development of new technologies, integration of advanced sensors and computer control systems, wastewater irrigation, and evaluation of emerging technologies and practices. With its advanced facilities, the Irrigation Technology Center will be the focal point for technological innovation research in Texas. The Irrigation Technology Center is expected to lead in the use of GIS, information technologies and systems analysis applications in irrigation.

### Evapotranspiration (ET) Determination

Evapotranspiration (ET) is a measurement of the amount of water required by plants and crops under specific climatic and growth conditions. The Irrigation Technology Center will be equipped with 28 weighing lysimeters in order to determine the exact water requirements of plants and crops based on the concepts of PET (potential evapotranspiration), crop and turf coefficients, and stress factors. Four (4) large lysimeters will be devoted to crops, eight (8) medium lysimeters for turf and ground covers, and 16 small lysimeters for landscape plants.



## Facilities for innovation and technology transfer .

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State-of-the-art facilities will be constructed to make the Irrigation Technology Center the pre-eminent testing and learning center in the United States, and possibly the world. Unique facilities will include:

- Hydraulics Lab, testing, buildings and outdoor test facilities
- Computer system for data storage, manipulation, graphics and GIS-based applications, training, and regional irrigation analysis
- ET Center with lysimeters, PET Regional Networks
- True-scale, operating irrigation systems, representing all major technologies, covering approximately 400 acres; model landscape demonstration areas.
- Classrooms, laboratories, office space, workshops, warehouse, vehicles, and maintenance equipment.
- Mobile labs/testing equipment
- Interactive visitors center (future development)



## A Long Term Commitment

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The Irrigation Technology Center will be associated with the Texas A&M University System. Organizational structure will include an oversight committee made up of major stakeholders and a technology advisory committee composed of irrigation experts from the public and private sectors. ITC will cooperate with other universities, government entities, NGO's and organizations from around the globe. It is important for the Irrigation Technology Center to be associated with pre-eminent world class universities and other organizations, due to the education, testing and applied research missions, and to ensure that all programs meet the highest scientific and educational standards.

Public Funding and private donations will be sought to construct and operate the Irrigation Technology Center. A financing plan will be developed in consultation with the oversight committee and major stakeholders. A proposed endowment will provide the long-term support for the Irrigation Technology Center. Funding of the endowment will be through donations and revenues generated by the Irrigation Technology Center.

## Contact Information

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The Agricultural Program  
Texas A&M University System

The Irrigation Technology Center

[Guy Fipps, PhD, P.E.](#)  
Profesor and Extenstion Agricultural Engineer  
Department of Agricultural Engineering  
Texas A&M University  
College Station, TX 77843-2117  
Phone: 409/845-7454  
FAX: 409/847-8828  
email: [g-fipps@tamu.edu](mailto:g-fipps@tamu.edu)