



## FEDRO S. ZAZUETA <sup>1</sup>

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### EDUCATION

Ph.D.	1982	<i>Agricultural Engineering</i> , Colorado State University, Ft. Collins, CO, USA.
M.S.	1978	<i>Water Use and Conservation</i> , Instituto Tecnológico y de Estudios Superiores de Monterrey, Monterrey, N.L., México.
B.S.	1974	<i>Civil Engineering</i> , Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM), Monterrey, N.L., México.

### POSITIONS HELD

2002-date	Professor and Director, Office of Academic Technology, University of Florida, Professor and Director (Begin January 1, 2002).
1997-2001	UF/IFAS Information Technologies Office, Director.
1982-1997	Agricultural and Biological Engineering Department, University of Florida, <i>Assistant Professor</i> , <i>Associate Professor</i> , and <i>Professor</i> . Served as Coordinator of the IFAS Software Support Office.
1975-1979	Thermal, Fluids and Control Engineering Department, Instituto Tecnológico y de Estudios Superiores de Monterrey, <i>Profesor de Planta (Lecturer)</i> .
1974-1975	Civil Engineering Department, Universidad de Sonora, Sonora, México, <i>Profesor de Planta (Lecturer)</i> .
1989-date	Agricultural Engineering, Adjunct Professor, UNICAMP, Campinas, Brasil.
1992-date	Agricultural Engineering, Adjunct professor, Universidad de Concepción, Chillán Chile.

### ADMINISTRATIVE EXPERIENCE

Since January 2002, was responsible for providing leadership to and managing the Office of Academic Technology (OAT) of the University of Florida. OAT provides information technology services in support of the academic mission of the University, including teaching, research, extension and outreach ([www.oat.ufl.edu](http://www.oat.ufl.edu)). Was directly responsible for supervision of 8 Directors and a yearly budget of \$6,200,000. Led the effort to develop an Information Technology Strategic Plan for the University of Florida, followed by its implementation. This included improvements to the organization by collapsing several IT related units into a single coherent unit, and establishing clear goals and assessment procedures for the units under OAT. Some highlights are the successful deployment are of one of the nations largest enterprise level course management systems, a state-wide video transport infrastructure, grid-based high performance computing resources, and instituting a faculty training program focused on technology based pedagogy. OAT supports 52,000 students, 4000 faculty and 12,000 staff. OAT includes 82 staff members and 300 student employees.

From 1997 through 2001 was responsible for providing leadership and management to the Office of Information Technology of the Institute of Food an Agricultural Sciences. This included a state wide network, business and administrative computing services, customer support services, information delivery system and a software engineering team. Some highlights are the growth of the state wide network from 15 nodes to over a hundred nodes in a period of a year, development of an extension digital information resource, development of a statewide weather network, development of a distance pest and animal identification system, and creation of a help desk.

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<sup>1</sup> This is an abridged copy of my curriculum vitae. More details available upon request or see <http://fsz.ifas.ufl.edu>.

Starting in 1992 led the creation of the IFAS Software Support Office and managed the office for several years until it was incorporated into the IFAS Office of Information Technology in 1997. This office was created as a center to develop and distribute software to agricultural audiences. The office was self funded and generated sufficient funds to support one faculty two programmers and two administrative assistants. This office was instrumental in accelerating the adoption of information technology by agricultural audiences in Florida and led to national recognition in this area. Some highlights are the distribution of over 100 software titles worldwide, a yearly Florida State Computers in Agriculture Meeting and Trade show held from 1982 through 1994, the organization of the first World Conference on Computers in Agriculture, still held to date in collaboration with partners from Europe and Asia.

## TEACHING EXPERIENCE

Have taught and developed courses at the undergraduate, and graduate level including web-based courses and distance education courses using, video, satellite, WWW-based and desktop videoconferencing technologies. In addition, numerous presentations in state, national and international professional meetings, workshops and training courses to industry and government agencies on topics related to water management and Information Technologies. In particular, provided leadership to the creation of an Agricultural Information Technology Minor in the College of Agriculture and Life Sciences at the University of Florida.

### Courses Taught/Developed

#### Undergraduate Courses

Fluid Mechanics I and II, Mathematics I, Hydraulics, Hydromechanical Installations, Thermodynamics, Thermal Engineering Lab., Heat and Mass transfer for Biochemical Engineers, Soil and Water Engineering, Irrigation in Florida, Drainage and Hydraulic Structures, Introduction to Engineering, Computers in Agriculture and Natural Resources, Networking, Instrumentation and Control in Ag. Systems, Agricultural Software Applications Development, Agricultural Decision Support Systems Development.

#### Graduate Courses

Trickle Irrigation Design, Agricultural Software Engineering, Advances in Microirrigation.

### Selected International Courses Taught

- 2005 Information Technology in Agriculture. Universidad de Concepción. Chillán, Chile. 4 days.
- 2004 Irrigation of Fruit Trees. Universidad de Concepción. Chillán, Chile. 4 days.
- 2003 VIII International Course on Irrigation Systems, Universidad Autónoma Chapingo, México. 1 day.
- 2002 VII International Course on Irrigation Systems, Universidad Autónoma Chapingo, México. 1 day.
- 2001 National Course in Irrigation. Microirrigation control and automation. Chapingo, México. 1 day.
- 1998 Microirrigation design and management. International Irrigation Course. Córdoba, Spain. 5 days.
- 1997 Computer aided design and management of irrigation systems. International Irrigation Course. Chapingo, Mexico. 5 days
- 1996 Visual Programming. 6th International Conference on Computers in Agriculture. Cancún, México. 1 day.
- 1994 Geographic Information Systems. 5th International Conference on Computers in Agriculture. Orlando, Florida. 1 day.
- 1993 Introduction to biological simulation. Instituto Mexicano de Tecnología del Agua, Cuernavaca, México. 5 days.
- 1992 Rapid prototyping of expert systems for agriculture. INIA, Montevideo. Uruguay. 5 days.
- 1991 Microirrigation systems design, installation and management. Curso Internacional de Riego. Junta de Andalucía. Dirección General de Investigación y Extensión Agraria. Córdoba, España.
- 1990 Agricultural Computing: Computer aided design and expert systems. Universidad Nacional Autónoma de Chapingo, Texcoco, México. 3 days
- 1990 Computer applications in agricultural water management. FUSADES, San Salvador. 3 days.

- 1989 Irrigation technology course. Presentation to engineers, credit officials and irrigation system managers on selection of irrigation systems and the use of microirrigation in fruit crops. Banco de México, Torreon, Coah., México. 1 day.
- 1988 Microirrigation Technology course to soviet engineering team (senior engineers of new Valmont plant in the Soviet Union). VALMONT, Valley, Nebraska. 6 days.
- 1987 Crop and Irrigation Water Requirements. USAID, Hiderabad, Pakistan. 15 days.
- 1982 Drainage engineering. University Hermanos Escobar, Cd. Juarez, Chi. México. 3 days.
- 1981 Cadastral and photogrammetric computer applications. INALDAZ Ltda., Quito, Ecuador. 3 days.
- 1977 Hydraulics of canals and wells. Peerless-TISA, Monterrey, N.L., México. 3 days.

## Selected Honors

- 2007 Outstanding paper award, ASABE (American Society of Agricultural and Biological Engineers).
- 2006 Distinguished Service to Agriculture, ΓΣΔ (Gamma Sigma Delta)
- 2005 Elected ASAE Fellow (American Society of Agricultural and Biological Engineers).
- 2002 Outstanding Leadership, ASAE (The Society for Engineering in Agriculture).
- 2001 Outstanding Specialist Award. National Association of Extension Professionals.
- 1999 Distinguished Service Award, United States Department of Agriculture.
- 1998 Davis Productivity Award, Florida Tax Watch (Florida Automated Weather Network).
- 1998 Outstanding Program Award, Epsilon Sigma Phi, National Honorary Extension Fraternity.
- 1998 President's Citation, ASAE (The Society for Engineering in Agriculture).
- 1997 Superior Accomplishment, Employee of the year Award, IFAS-University of Florida.
- 1996 Directors Citation. ASAE.
- 1994 Davis Productivity Award, Florida Tax Watch (CD-ROM Development).
- 1990 Young Engineer Award. ASAE, Florida Section.
- 1988 Best Paper Award, Florida State Horticulture Society.
- 1984 Best Paper Award, co-author. Florida State Horticulture Society.
- 1978 Professor of the year, ITESM (OscarIMA). Monterrey, N.L, México.

## PROFESSIONAL SOCIETIES

- ASABE, American Society of Agricultural and Biological Engineering.
- CIGR International Commission of Agricultural Engineering
- International Soil Science Society.
- Soil and Crop Science Society of Florida.
- Florida Irrigation Society.

## RESEARCH EXPERIENCE

Research program in agriculture focuses mainly on the use of computer technologies for the improvement of design and management of water resource systems. Recent work includes techniques such as grid computing, deterministic and stochastic simulation, GIS, DBMS, conventional and real-time expert systems, neural networks, and data acquisition and control.

Research program in education focuses on eLearning technologies and IT services at the enterprise level, including learning objects.

## Selected Publications

*Author of numerous research, extension and other publications, including books and software in use by industry. For a complete list see <http://fsz.ifas.ufl.edu>*

Zazueta, Fedro S., Jiannong Xin, Luis Santos Pereira, and André Musy. 2006. Section 6.4 Information Technologies in Water Management, pp. 401-414 of Chapter 6 Management and Decision Support Systems,

in CIGR Handbook of Agricultural Engineering Volume VI Information Technology. Edited by CIGR--The International Commission of Agricultural Engineering; Volume Editor, Axel Munack. St. Joseph, Michigan, USA: ASABE.

E. S. Sepúlveda Bustos, F. S. Zazueta, R. Bucklin, E. Holzapfel Hoces. Rapid Prototyping of Learning Objects for Agricultural and Biological Engineering Education. 2006 Applied Engineering in Agriculture. Vol. 22(3): 461-475.

Zazueta, F.S. 2006. Curriculum Development Using Ontologies and Learning Objects. Proceedings of the XVI CIGR World Congress. Bonn, Germany. <http://www.2006cigr.org/proceedings.html>

Sepúlveda, E.S. and F.S. Zazueta. Wetted bulb dimensions from a trickle source. ABE351. Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. 2004

Vergot, P., F.S. Zazueta and H.W. Beck. 2004. Use of personal digital assistants for extension program record keeping. Journal of extension. Vol. 42 Number 4. <http://www.joe.org/joe/2004august/tt6.shtml>

Zazueta, F.S., and P. Vergot III. Use of Handheld Computers in Agriculture. Proceedings of the 5<sup>th</sup> Congress of the European Federation of Information Technology in Agriculture. July 2003, Debrecen, Hungary. pp: 12-16.

Zazueta, F.S., J. Xin, T.A. Wheaton and K.T. Morgan. Citrus Microirrigation Decision Support System. World Congress on Computers in Agriculture and Natural Resources. Proc., ASAE. Pp.803-808. 2001.

Zazueta, F.S., A.J. Wilkening, H.W. Beck, L.A. Halsey and T. Hintz. A centralized/distributed model for information technology resources. Computers in Agriculture. 7<sup>th</sup> International Conference Proc., ASAE. Pp. 292-299. 1998.

Albrigo, L.G., J.I. Valiente and F.S. Zazueta. Use of Internet video-conferencing technology for distance education in agriculture. Computers in Agriculture. 7<sup>th</sup> International Conference Proc., ASAE. Pp. 402-412. 1998.

R. Testezlaf, F.S. Zazueta, and T.H. Yeager. A real-time control system for greenhouses. Applied Engineering in Agriculture. ASAE. 0883-8542/1303-1329. 1997.

Zazueta, F.S., R.A. Bucklin, M. Turner, F.A. Chapman, and A.M. Lazur. Aquaculture aeration using irrigation porous pipe. Proc. 5th Int. Irr. Congress. Orlando, FL. ASAE. p. 37-42. 1995.

Zazueta, F.S., J. Xin, and A.G. Smajstrla. Simulation of soil-moisture sensors with linear errors. Soil and Crop Sci. Soc. of Fla. 1993.

Zazueta F.S., and A.G. Smajstrla. Microcomputer based control of irrigation systems. Applied Agricultural Engineering. 1992. Vol. 8(5): 593-596.

Zazueta, F.S. (Invited Contribution) Agricultural Computing in the United States. @groinformatica, Journal of the Dutch Society for Informatics in Agriculture. 1991. 4(3):20-24.

Nass, I.A., F.S. Zazueta, and R.A. Bucklin. Microcomputer simulation of heat transfer in tropical swine housing. Journal of Agricultural Mechanization in Asia, Africa and Latin America. 1990. Vol. 21. No. 4, pp. 38-42.

Zazueta, F.S., A.G. Smajstrla, and D.Z. Haman. Computer aided design of landscape irrigation systems. Applied Agricultural Research. 1989. Vol 4. No. 4, pp. 280-284.

Zazueta, F.S., and A.G. Smajstrla. Computer control of irrigation systems. Int. Plant Prop. Soc. Proc. 38. 1988. 6p.

Zazueta, F.S., and A.G. Smajstrla. Microcomputer aided design and management of irrigation systems. International Irr. Expo. and Tech. Conf. Proc. The Irrigation Assoc. 1987. 1988. 165-172.

Zazueta, F.S., A.G. Smajstrla, and D.S. Harrison. A simple numerical model for the prediction of soil-water flow from trickle sources. Soil and Crop Sci. Soc. Fla. Proc. 44. 1985. 72-76.

Zazueta, F.S., A.G. Smajstrla, and D.S. Harrison. Microcomputer control of irrigation systems. I: Hardware and software considerations. Soil and Crop Sci. Soc. Fla. Proc. 43. 1984. 123-129.

Zazueta, F.S., and D.B. McWhorter. Stochastic simulation of agricultural drainage systems. (Simulación estocástica de sistemas de drenaje agrícola). Academia Nacional de Ingeniería. Memorias. 1. 1983. 174-179

Zazueta, F.S. Optimal design of sprinkler irrigation systems. (Diseño 'óptimo' de sistemas de riego por aspersión y su cálculo electrónico). Academia Nacional de Ingeniería, Memorias. 1. 1977. 192-197.

#### Selected Software:

CMDSS: Citrus Microirrigation Decision Support System. Citrus irrigation management management software based on a two container model. It includes real-time data acquisition over the Internet for weather data. 2001.

Turf: Turf Irrigation Management software based on long-term historical data including effects of reduced irrigation. 2000.

Irrigation Toolbox:: A CDROM containing a collection of software and publications on Florida Irrigation. 1999.

WATER: A collection of 50 utilities for design, management and operation of water resource systems. The package covers such areas as irrigation design and management, ET and water requirement estimations, drainage design, well hydraulics, open channel design, and soil conservation. (1983-1994)

VENT: Heat transfer simulation of swine housing in tropical climate. Developed in cooperation with UNICAMP, Brazil, 1990.

PIGALION: Computer aided software engineering tool for automated code generation. including program structure, I/O mask drivers for standard devices and basic DBM capabilities. Developed for GESA, México D.F., 1986.

## Selected Grants

F.S. Zazueta. College level Academic Skills Test Support. Florida Department of Education. 2002-2006. \$1'257,563.

F.S. Zazueta. College level Academic Skills Test Administration. Florida Department of Education. 2002-2006. \$1'541,492.

F.S. Zazueta. Florida Agriculture Weather Network Expansion. Division of Emergency Management. 2000-2001. \$127,000.

F.S. Zazueta. Sustainable Agriculture Network. United States Department of Agriculture (USDA). 1999-2000. \$32,000.

Howard Beck, Fedro S. Zazueta, Don Poucher and Julie Graddy. Development of an Automated System for the Generation of Management Guides. 1997-1998, \$160,000.

F.S. Zazueta, G. Miller and A.G. Smajstrla. Turfgrass Water Use and Quality Under Reduced Irrigation Conditions. 1997-1998. \$82,000

F.Z. Zazueta , A.G. Smajstrla. Development of an Automated Water Reporting System Using DBMS, GIS And Simulation Linkages. 1993-1994. \$70,000.

F.Z. Zazueta. Automated Weather Data Acquisition DBM. 1994-1995. \$30,000.

T. French, J. Stricker and F.S. Zazueta. Use of Perennial Peanuts for Mined Land Recovery. 1991-1993. \$90,000.

F.S. Zazueta. GIS for Water for Agricultural Industrial and Urban Use. St. John's Water Management District. 1993-94. \$70,000.00

F.Z. Zazueta, A.G. Smajstrla. Simulation Engines for Crop Water Use in Florida. St. John's Water Management District. 1993-1994. \$30,000.

## INTERNATIONAL WORK

Conducted international work that includes university exchange programs, teaching, consulting, organizing international conferences and hosting graduate and undergraduate visitors such as:

- International short term consulting in México, Panamá, Ecuador, El Salvador, Costa Rica, Honduras, Uruguay, Jamaica, Pakistan, Chile, Argentina and Spain since 1976, in the areas of water management, photogrammetry, GIS, expert systems, data acquisition and control, and computer systems integration.
- Chairman of the International Conference on Computers in Agriculture. ASAE (American Society of Agricultural Engineers), 1998, 1997, 1996, 1995, 1992, 1990, 1988, 1986, 1984.
- Initiated exchange programs between University of Florida and universities in México, Spain, Brasil, Chile, and The Netherlands.
- Adjunct faculty to the Agricultural Engineering Department, UNICAMP, Campinas Brazil, and the the Agricultural Engineering Department, Universidad de Concepción Chillán, Chile.

## Selected International Consulting

- 1996 Object oriented redevelopment of a GIS production system. GESA. Guadalajara, México. (2 days)
- 1995 Assesment of DBMS and GIS requirements for cadastral applications. DICARTU. México D.F. (5 days)
- 1993 Development of integrated software for management of a canal network (módulo 3, Distrito de Riego Delicias Chihuahua) serving 17,000 users, that includes database management, GIS, biological simulation, hydraulic canal network simulation and expert systems (2 year), Instituto Mexicano de Tecnología del Agua. IMTA, Cuernavaca, México.
- 1992 Troubleshooting oil-well drilling rigs control software (4 days). PEMEX/ROTENCO. Chiapas, México.
- 1991 Consulting on problems related to biological clogging of trickle irrigation systems, fertilization practices and water management in nurseries in nurseries (5 days). FUSADES, San Salvador, El Salvador.
- 1991 Critical review of environmental impact assesments of 24 hydro-agricultural development programs in México. 13 days. World Bank.
- 1990 Provided technical expertise on water management disputes arising design problems in pumping systems for frost protection. Congen Properties vs. Johnston Pump legal case (10 days). Henderson, Franklin, Sterns and Holt, Ft. Myers, Florida.
- 1989 Analysis of institutional computer system requirements (3 days). Universidad Agrícola Panamericana, El Zamorano, Honduras.
- 1989 Artificial Intelligence in Manufacturing (2 days). VITROTEC, Fideicomiso, Monterrey, N.L., México.

## Selected International Professional Service

- Chairman, Sustainable Agricultural Production Systems: United Nations Commission on Sustainable Development. WFEO-COMTECH (World Federation of Engineering Organizations Committee on Technology), 2000.
- Chairman, World Congress on Computers in Agriculture, ASAE, SBI-Agro (Brazilian Society of Informatics in Agriculture), EFITA (European Federation of Information Technologies in Agriculture), AFITA (Asian Federation of Information Technologies in Agriculture), CIGR (International Commission of Agricultural Engineering), WFEO. 1999-date.
- Member of the Food and Agriculture Committee for WFEO (World Federation of Engineering Organizations), 1996-date.
- Chairman of the Food and Agriculture Committee for UPADI (Unión Panamericana de Asociaciones de Ingeniería), 1993.

- Chair or Co-chair of the International Conference on Computers in Agriculture, ASAE (The Society for Food and Agriculture in Engineering), 1982-date.

## SELECTED INVITED LECTURES OR SPEECHES (Keynote or plenary speaker)

- 2007 Gestión del Conocimiento. **Keynote Speaker.** 4º Ciclo de Conferencias. Políticas de Estado. IICA, El País, SEAGRO. Montevideo, Uruguay.
- 2006 Curriculum Development Using Ontologies and Learning Objects. **Invited Speaker.** CIGR World Congress. Bonn, Germany.
- 2005 Towards the Collaborative University. **Plenary Session.** EFTTA-WCCA. Portugal.
- 2004 Information Technology in Agriculture. **Invited Speaker.** Latin American Association of Agricultural Engineers Congress. San Jose Costa Rica
- 2003 Use of PDAs in Agricultural Extension. **Keynote Speaker.** European Federation of IT in Agriculture Congress. Debrecen, Hungary.
- 2001 Information Technologies Applied to Agriculture. Symposium on New Technologies Applied to Agriculture. **Keynote Speaker.** ITAP. Albacete, Spain.
- 2000 Change in Information Technologies: Its application to Agriculture, InfoAgro2000: Computers in Agriculture Congress. **Plenary Session.** Ponta Grossa, Brasil.
- 2000 Bioengineered Foods. American Association of Engineering Societies. **Invited Speaker.** Academy of Engineering. Washington D.C.<sup>2</sup>
- 2000 Information Technologies in Agricultural Extension. 2<sup>nd</sup> Asia Federation of Information Technologies in Agriculture (AFITA) Congress. **Keynote Speaker.** Suwon, Korea.
- 2000 The Role of Engineering in Sustainable Food Production<sup>3</sup>. **Invited Speaker.** United Nations Sustainability Committee. UN General Session. New York.
- 1999 A Centralized Distributed Model for Information Technologies. 2<sup>nd</sup> European Federation of Information technologies in agriculture (EFITA) Congress. **Plenary Session.** Bonn. Germany.
- 1999 Information Technologies for the XXI Century. World Federation of Engineering Associations. Symposium on Food, Agriculture and Energy. **Plenary Session.** Madrid, Spain.
- 1998 Sustainability and Water Resources: Fantasy or Achievable Goal? Seminario internacional del uso integral del agua. **Keynote speaker** Universidad Autónoma Chapingo, México.
- 1996 Computers in Irrigated Agriculture. XI National Irrigation and Drainage Congress. **Plenary Session.** Campinas, Brasil.
- 1996 Computer-based Tools for Irrigation. AGRITEC Conference, **Invited Speaker,** Tel Aviv, Israel.
- 1995 24th Congress of Agricultural Engineering, Brazilian Society of Ag. Eng. Informatics applied to hydroagricultural projects. **Plenary Session.** Visoça July 14/95

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<sup>2</sup> This presentation was made at the Academy of Engineering to assist in developing a position statement related to genetically modified foods using biotechnology.

<sup>3</sup> Organized forum at the request of the American Association of Engineering Societies and The World Federation of Engineering Associations and made presentations on low-tech sustainable energy production and engineered animal powered plows.

- 1995 Electronic Information Delivery Technologies. EMBRAPA. **Invited Speaker.** Sete Lagoas. Brasil.
- 1995 International Developments in Microirrigation. 1995. **Plenary Session.** 5th Int. Irr. Congress. Orlando, FL. ASAE
- 1994 Combate a la Pobreza (Combating Poverty.) **Invited Speaker.** UPADI congress. Acapulco, México.
- 1994 Agricultural Sustainability Issues in Developing Countries. **Plenary Session.** 1er Congreso, Asociación Latinoamericana de Ingenieros Agrícolas. Universidad de Concepción. Chillán, Chile.
- 1992 Tecnologías Emergentes en el Sistema de Riego Localizado (Emerging Technologies In Microirrigation). International Symposium on irrigation of Horticultural Crops. International Society of Horticultural Science. Madrid, Spain. **Invited speaker.**
- 1992 Sistemas de Microirrigación (Microirrigation systems). Curso Internacional de Riego. Universidad Autónoma Chapingo. Chapingo, México. **Invited speaker.**
- 1991 Simulación de sistemas Agrícolas (Simulation of agricultural systems). Semana de Parasitología Agrícola. Universidad Autónoma Chapingo. Chapingo, México. **Invited speaker.**
- 1991 Agroinformática. 2do Simposio Internacional Sobre la Ciencia y Tecnología Como Fuerza Productiva. Montevideo, Uruguay. **Invited speaker.**
- 1991 Computer Design and Management of Microirrigation Systems. Centro de Investigación y desarrollo Agrario. Curso Internacional Sobre Teoría y Práctica de Riego. Córdoba, España. **Invited speaker.**
- 1990 Control Automático en Invernaderos (Automated control of greenhouses). Modernización de la empresa agropecuaria. Simposio Internacional de Agronomía. Instituto Tecnológico y de Estudios Superiores de Monterrey. Monterrey, N.L. **Invited speaker.**
- 1990 Computer Aided Design of Irrigation Systems. Centro de Investigación y Desarrollo Agrario. Curso Internacional Sobre Teoría y Práctica de Riego. Córdoba, España. **Invited speaker.**
- 1990 Microirrigación en Frutales (Microirrigation of fruit crops). Universidad de Concepción. Curso Internacional de Manejo de Agua en Frutales. Chillán, Chile. **Invited speaker.**

## **EXTENSION EXPERIENCE**

### **Selected Major Programs**

Worked as an extension specialist since 1982 (40 to 60% appointment at UF/IFAS). Was a major collaborator/leader of highly successful program in water management with an emphasis on computer applications and information technologies. These efforts have impacts at an institutional and state-wide level. Some Major programs are:

#### Provided Leadership for Statewide Planning Programs:

FL028: Florida Water Conservation. (1986-1991)

FL041: Florida Water Conservation. (1991-1996)

#### Software Support Office.

Played a key role in establishing this office. It was the official support and distribution center for agricultural software for UF/IFAS. Managed the office from 84-86 and 95-96.

#### Developed software for water system design and management



Developed over 60 programs designed for consultants, engineers and growers. These are marketed by the University of Florida.. These are widely used in Florida, the US and internationally.

#### Extension Digital Information Source.

This is currently the most important extension information delivery system for the University of Florida. The system evolved into a web based information delivery system.

#### Mobile irrigation laboratory.

Developed a field irrigation testing laboratory, including software for on field interactive evaluation. The field lab is in use by West Coast Regional Water Authority, Soil Conservation Service, and South Florida Water Management District.

#### Florida Automated Weather Network.

A statewide network of weather stations providing real-time data using web delivery mechanisms primarily designed for agricultural audiences. Including management tools and climate prediction information.

#### Linkages

Worked with many associations and agencies to effectively deliver knowledge and management tools to UF/IFAS constituents. For example, the Florida Irrigation Society, Grower associations, water management districts, USDA, SCS/NRCS, county agents and private individuals. This included the development of standards, design and management procedures and processes, specialized software and automated systems.