



ACCOMPLISHMENTS

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Technology Transfer

Following are summaries of the laboratory's major technology transfer accomplishments for 2002.

Irrigation and Water Quality

Scientist: Albert Clemmens

Canal Automation

Software for Automated Canal Management (SacMan), developed at the U.S. Water Conservation Laboratory, was turned over to CRADA partner Automata, Inc. during 2002. This software works with commercially available Supervisory Control and Data Acquisition Systems (SCADA) and provides real-time control of canals that distribute water to a large number of users, typical of large irrigation projects. SacMan has a number of features that allow users to gradually phase in automatic controls – starting with manual control and ending with full automatic computer control. The first commercial installation of SacMan also occurred during 2002.

Environmental and Plant Dynamics

Scientists: Paul Pinter, Tom Clarke

Detecting Plant Stress

Ed Barnes, Glenn Fitzgerald

Provided Chris Humphries of Agrometrics LLC (a commercial provider of remote sensing imagery in both Australia and USA), with practical information for calculating and using the Water Deficit Index and the Canopy Chlorophyll Content Index for determining water and nutrient status of cotton (May 2002).

Scientists: Tom Clarke, Ed Barnes

Agricultural Remote Sensing

Dr. Matthias Ploechl from the Bornim Institute for Agricultural Engineering (Potsdam, Germany) visited the USWCL from Jan. 26 to March 1, 2002. He learned about interpreting remotely-sensed agricultural observations, the suitability of different wavebands for long term sensing of crop development, and the applicability of remote sensing data to specific crop growth and development models.

Scientists: Terry Coffelt

New Crops

The Virginia Agricultural Experiment Station, Virginia Polytechnic Institute and State University, and United States Department of Agriculture, Agricultural Research Service, released a new peanut cultivar, 'Wilson', in 2002. Wilson has higher yields than current varieties and early maturity. Excellent pod shape and color characteristics make it ideal for the in-shell market. Foundation seed is being grown by the Virginia Foundation Seed organization and seed should be available to growers as registered and/or certified seed in 2004."

ARS WEEKLY ACTIVITY REPORTS

Throughout the year scientists submit items for the “ARS Weekly Activity Report. These reports are consolidated at ARS Area level and submitted to ARS headquarters for the information of agency and departmental management.

Albert J. Clemmens - A group of farmers and NRCS personnel visit the US Water Conservation Lab: On January 7-9, 2002, a group of farmers and NRCS personnel from the Newlands Irrigation Project in Fallon NV visited the U.S. Water Conservation Laboratory in Phoenix, AZ. Lectures and a field tour provided the group with background and experiences with level-basin irrigation systems and the high productivity and efficiency that can be attained. Of special interest was a novel adaptation of basin irrigation where excess surface water is drained off. NRCS plans to find a demonstration site for this technology in the Fallon area.

Albert J. Clemmens - ARS scientist receives ARS Engineer of the Year Award: On January 18, Bert Clemmens, Laboratory Director for the U.S. Water conservation Laboratory, Phoenix, AZ, will receive the ARS Engineer of the Year Award from the National Society of Professional Engineers (NSPE). The awards ceremony is being held at the National Press Club in Washington, DC. Dr. Clemmens is one of 10 finalists for the Federal Engineer of the Year Award.

Albert J. Clemmens - ARS scientist interviewed: On February 4, 2002, Bruce Kimball, ARS Soil Scientist at the U.S. Water Conservation Laboratory, Phoenix, AZ was interviewed by a reporter from Science/ScienceNOW about a recent paper in Science. The paper by A. Bloom et al. Shows that the response of wheat to elevated concentrations of CO₂ is influenced by the form of nitrogen fertilizer available to the plant, with smaller responses obtained with NO₃⁻ compared to NH₄⁺.

Albert J. Clemmens - ARS scientists visit the National Water Management Management Center at Little Rock NV: On Feb 13 and 14, Bert Clemmens and Eduardo Bautista, ARS-Phoenix, AZ, and Steve Evett, ARS-Bushland, TX, met with Dennis Carman and Mike Sullivan of the Natural Resources Conservation Service’s National Water Management Center at Little Rock, AR. This Center was established to provide a link between water management technology, particularly ARS technology, and NRCS field offices. The visit served to initiate field studies on irrigation system operations and water management within the Bayou Meto Irrigation Project, east of Little Rock. Dr. Evett just started a 6-month detail there to establish long-term cooperation between the two agencies on technology transfer.

Albert J. Clemmens - US Water Conservation Lab scientist attend workshop in Adelaide, Australia: On Feb 27-28, Bert Clemmens from the U.S. Water conservation Laboratory will be attending a workshop in Adelaide, Australia, to review rehabilitation options for the Lower Murray Region of South Australia. The region utilizes 20% of the South Australia’s River Murray irrigation allocation, but is currently poorly managed. The workshop was organized by the Department of Primary Industries and Resources, South Australia. While in Australia, Dr. Clemmens will examine irrigation practices in other regions along the Murray River.

Bruce A. Kimball - ARS scientist identified as “Highly Cited Researcher.” Dr. Bruce A. Kimball, Research Leader at the USDA-ARS U.S. Water Conservation Laboratory, Phoenix, Arizona, has been identified as a “Highly Cited Researcher” in the field of Agricultural Science by the Institute of Scientific Information (ISI, publisher of Current Contents). The “highly cited” designation is an honor bestowed on the world’s most cited authors – comprising less than one half of one percent of all publishing researchers. Dr. Kimball’s name and résumé are to be posted on 28 March 2002 in the Agricultural Sciences category on ISI’s Web site at <http://isihighlycited.com>.

Glenn J. Fitzgerald - ARS Scientist to Participate in Hyperspectral Remote Sensing Workshop: From March 4-8, Glenn J. Fitzgerald, Research Agronomist, Environmental and Plant Dynamics, US Water Conservation Laboratory, Phoenix, AZ, will present a paper to remote sensing experts from academia, government, and private industry at the Airborne Visible Infrared/Red Imaging Spectrometer (AVIRIS) workshop at Jet Propulsion Laboratory in Pasadena, CA. His presentation, “Detecting Spider Mite Damage in Cotton through Spectral Mixture Analysis of AVIRIS Imagery” will illustrate the practical application and potentials of hyperspectral remote sensing to precision agriculture.

Paul J. Pinter Jr. - ARS Team Collaborates with NASA and DOE: On July 11, remote sensing researchers with the U.S. Water Conservation Laboratory, Phoenix, AZ worked together with scientists from the Commercial Remote Sensing program at NASA’s John C. Stennis Space Center in Mississippi and the Emergency Response Team from the Department of Energy’s Bechtel Nevada Laboratory. The researchers measured reflected light and surface temperatures of agricultural fields using sensors deployed at ground level and also from helicopter, fixed-wing Cessna, and Lear Jet aircraft. Their joint approach provided an extensive data set that will be used to verify methods for quantifying plant response to environmental stress conditions.