FAR WEST TEXAS REGION

Texas A&M AgriLife Research and Extension Center at El Paso

Pecos Station, Texas A&M AgriLife Research and Extension Center at Lubbock

GOAL

Protect water quality and increase the amount of water available for urban and rural use through new technologies and approaches.

PROGRESS

Reducing soil and water salinity

- Soil and water salinity is a critical issue in Far West Texas, where it threatens the long-term viability of irrigated agriculture.
    - *Researchers at the El Paso Center tested inexpensive soil-moisture sensors to help farmers identify appropriate sensors for elevated salinity conditions.*
    - *Results show that at least one irrigation, or about 3,000 acre-feet of freshwater per year, can be saved using soil moisture–based irrigation scheduling in El Paso County.*
- A Phase I analysis of the economic impacts of salinity in the Upper Rio Grande Basin showed damages exceeding $10 million per year, with 75% of the damages affecting urban water users in El Paso.
    - *The analysis also estimated that damages could be cut in half with a 200 parts per million reduction in salinity concentration.*
- Scientists at the El Paso Center and colleagues at the Lubbock Center and its Pecos Station are working to find new ways to recycle water to irrigate crops, including pecans and chile peppers.
    - *Results from three years of research on salinity management using an anionic polymer in irrigation water show reductions in both salinity and sodicity in the effective root zone of pecans.*
    - *The annual pecan nut yield in polymer-treated orchards increased by an average of 23%, which translates into an increase in gross revenue of $2,780 per acre.*

Saving water through precision measurements

- In Far West Texas, the El Paso Center is using an evapotranspiration tower and hydrologic cycle monitoring network to measure carbon dioxide, water vapor, and heat fluxes, using the eddy covariance technique. This helps them to develop improved and timely information for assessment of crop evapotranspiration, irrigation scheduling, and the potential impacts of climate change on hydrological processes and crop production.
    - *This information is available to producers via the Internet and is especially useful to farmers in developing and implementing drought-contingency plans and evaluating alternative sources of water.*

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Developing bioenergy crops that thrive on marginal-quality water

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    - *Early data indicate that varieties of switchgrass, sorghum, castor, and jatropha can tolerate irrigation water with high salinity levels.*

Protecting water resources in the border region

- The El Paso Center has been a key partner in a bi-national effort (the U.S.-Mexico Transboundary Aquifer Assessment Program) to ensure adequate water resources for Texas, New Mexico, and the Mexico border region.
    - *Researchers have produced hydrologic models and scientific information for state and local decision making about water rights and use.*

Monitoring water quality

- Center researchers provide scientific data on the protozoan water pathogen *Cryptosporidium* to support public health decisions and regulatory monitoring by the U.S. Environmental Protection Agency.

GOAL

Create economically feasible, sustainable alternative energy systems through basic and translational research in feedstocks, logistics, and conversion technologies.

PROGRESS

Algae for fuel

- Texas A&M AgriLife Research and General Atomics continue a strategic, collaborative alliance to research, develop, and commercialize biofuel production through farming microalgae in Texas and California. In 2012–2013, the Algae for Fuel program at the Pecos Station developed and evaluated flocculation processes for harvesting algae to reduce the cost of algal lipid production by 30%.

- The Pecos Algae Research and Development Facility at the Texas A&M AgriLife Research Station at Pecos, a partnership with General Atomics, aims to develop and demonstrate algae growth and harvesting techniques and bio-oil extraction processes that can be commercially scaled and economically replicated in the Southwest desert regions of the United States for industrial production of biofuels.
    - *Revolutionary changes in algae growth efficiency and separation technology could create an algae biofuels industry that is economically competitive with current fuel prices.*
    - *If a successful system can be demonstrated, 2,000-acre production systems may be a reality for the Permian Basin of Texas and the southwestern United States.*
    - *For each 2,000-acre unit, Texas A&M economists predict about $190 million per year in local economic impact.*

GOAL

Model and understand dynamic relationships among behavioral and economic factors that influence the development and sustainable adoption of new technologies for the benefit of consumers, producers, and society.

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PROGRESS

Evaluating the costs of State Water Plan management strategy

- In support of the 50-year State Water Plan, El Paso Center scientists developed expected costs for alternative agricultural water management strategies to identify the most economically efficient strategies and those that save the most water. Strategy costs ranged from $54 to $1,632 per acre-foot, with reservoir improvement and control systems having the lowest costs. This information is being used to develop the 2016 regional water plans to meet future water needs.

Developing tools to improve water operations and planning

- El Paso researchers modeled Rio Grande hydrologic conditions and alternative water management operations to help identify those that are the most effective and efficient. The results of this research are helping to develop strategies to sustain economic development and a healthy ecosystem, especially during periods of extreme drought. These strategies will benefit more than 2.5 million people in New Mexico and West Texas and along the U.S.-Mexico border.