

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



The El Paso Center, located in arid Far West Texas, serves a region that is unique in climate, geography, water resources, urban and agricultural development, demographics, and culture. An urban center in the Chihuahuan Desert, El Paso is the sixth-largest city in Texas, with 700,000 people, and is home to 96% of the population of Far West Texas. Franklin Mountain State Park, at an elevation of 7,200 feet, divides El Paso into east and west sides. The Fort Bliss Military Reservation adjoins El Paso to the northeast, and Ciudad Juárez, Mexico, with a population of 1.3 million, lies across the Rio Grande to the south. Agriculture is concentrated along the Rio Grande in the upper and lower El Paso valleys. Among the most important needs for agriculture and for urban residents is a reliable, adequate, and safe water supply. Rapid regional growth, competition for existing water, environmental issues, and frequent drought underscore the urgency for finding and implementing effective water solutions. El Paso Center scientists are working in partnership with irrigation districts, agriculture sectors, water utilities, other universities, government agencies, private industry, and the public to address these needs.



The center is internationally recognized for its research in groundwater and surface water management, crop and landscape plants, soil and water salinity management, reclaimed-water use, conservation program effectiveness, integrated river basin management, and evaluation of the economic impacts of technology and policy changes. Center scientists work closely with El Paso Water Utilities, The University of Texas at El Paso, New Mexico State University, and federal and state agencies on water-use technologies and water quality research. They also work with scientists in Mexico, China, Japan, Chile, Egypt, Qatar, Israel, Palestine, India, and other countries. The center is a lead in the three-state, binational United States–Mexico Transboundary Aquifer Assessment Program to address challenges of shared water resources in the Texas, New Mexico, and Mexico border region.

### **Current Research**

#### ***Conserving irrigation water while improving crop production***

Center scientists established an eddy covariance observation tower and weather station at a pecan orchard in collaboration with a local farmer. The information gathered is providing improved irrigation scheduling and methods, conserving thousands of acre-feet of water, and enhancing pecan production, even in current drought conditions. Research on salt tolerance of chile peppers found a wide range of variation among genotypes in a study of more than 20 varieties. Researchers continue to test chile pepper genotypes for salinity tolerance and are developing more effective methods of salinity management.

#### ***Reducing water and soil salinity in irrigated agriculture***

Salinity threatens the long-term viability of irrigated agriculture and the availability of urban water supplies in Far West Texas. Collaborating with local pecan growers, center researchers evaluated the benefits of applying anionic polymer polyacrylamide (PAM) through irrigation water over five growing seasons. Results indicate that PAM application reduced soil salinity by 41% and sodicity by 56% and improves irrigation water-use efficiency. The improved soil conditions increased pecan nut yields by 34%. Center scientists serve on the three-state (Colorado, New Mexico, and Texas) Rio Grande Salinity Coalition to reduce salinity basinwide.

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### **Using marginal-quality water to produce bioenergy crops**

Finding reliable sources of water to produce bioenergy crops in arid regions is a challenge that center scientists are meeting by developing crops that can use water sources such as saline groundwater, electric utility cooling water, treated urban wastewater, and graywater. Preliminary data from three projects indicate that select varieties of switchgrass, sorghum, canola, castor, and jatropha can tolerate the salinity of marginal-quality waters. In addition to beneficial use in crop production, using this water for irrigation can extend the supply of available freshwater for other purposes.

### **Research Impacts**

- El Paso Water Utilities and consumers have saved an estimated \$4 million because of center research on reclaimed-water use, including the development of usage guidelines and management assistance provided by center scientists.
- In collaboration with the El Paso County Water Improvement District #1, researchers are working to determine conveyance losses and potential water savings by lining canals. They found that by lining 10 miles of canals the district could save enough water to supply 1,000 acres of irrigated crops or 8,000 households.
- Center scientists led an assessment of salinity impacts and potential benefits of salinity reduction in the Upper Rio Grande basin. Analysis showed damages exceeding \$10 million per year, with 75% of the damages affecting urban users in El Paso. This analysis also estimated damages could be cut in half with a 200 ppm reduction in salinity concentration.
- Collaborating with New Mexico State University scientists, El Paso researchers found that compared to existing water allocation institutions, future drought damages in the Upper Rio Grande Basin could be reduced by 20%–33% per year through intra-compact and interstate water markets.

### **El Paso Center Facilities**

- El Paso — 44 acres of land donated by John and Betty McGuire, K. B. Ivey Investment Company, and Charles and Mary Gaither, with facilities built in 1976 including offices, laboratories with extensive analytic equipment, 200-seat auditorium, classroom, videoconference center, five greenhouses, urban water-conservation landscape garden, and award-winning cactus garden.
- Socorro — 190-acre research station established in 1942 on land donated by El Paso County. The land is used to produce pima cotton and pecans. A new building was built in 1986 with offices and chemical analyses and hydraulic laboratories.

### **About Texas A&M AgriLife Research**

#### ***A member of The Texas A&M University System***

Established in 1888, Texas A&M AgriLife Research is the state's premier research and technology development agency in agriculture, natural resources, and the life sciences. Headquartered in College Station, AgriLife Research has a statewide presence, with scientists and research staff on other Texas A&M University System campuses and at the 13 regional Texas A&M AgriLife Research and Extension Centers. The agency conducts basic and applied research to improve the productivity, efficiency, and profitability of agriculture, with a parallel focus on conserving natural resources and protecting the environment. AgriLife Research has 550 doctoral-level scientists, many of whom are internationally recognized for their work. They conduct hundreds of projects spanning many scientific disciplines, from genetics and genomics to air and water quality. The annual economic gains from investments in Texas's public agricultural research are estimated at more than \$1 billion. Through collaborations with other institutions and agencies, commodity groups, and private industry, AgriLife Research is helping to strengthen the state's position in the global marketplace by meeting modern challenges through innovative solutions.