

Agricultural science research is a global investment in protecting the future of our state. Agriculture in New Mexico accounts for approximately \$4 billion in direct sales and 42,000 jobs. Challenges to growers and ranchers are constant and evolving. Invasive pests, a decline in species diversity, pollinator health, resistance to pesticides, and limited water are needs that are being addressed by New Mexico State University's Agricultural Sciences Centers. The wide diversity of both growing conditions and cultures means solutions must be developed locally in conditions that reflect those faced by New Mexicans.



The Agricultural Science Center (ASC) at Clovis is centrally located in the largest crop production area of New Mexico and is uniquely qualified to conduct agricultural research and producer outreach activities aimed at efficiently managing the area's limited water resources and increasing the economic viability and sustainability of agricultural production.

UNDERSTANDING THE NEED FOR RESEARCH

From the start, the ASC at Clovis has helped agricultural producers in eastern NM increase profitability and sustainability on limited irrigated and dryland farms. With limited water access and rapidly deteriorating soil, researchers must assist farmers in finding sustainable solutions to upkeep crops. An Advisory Committee comprised of agricultural producers and business leaders from the area guide most of the research and outreach programs at the ASC at Clovis.



HISTORY OF RESEARCH

Research at the ASC-Clovis began in 1948, originally as dry-land field research. Irrigation studies were initiated in 1960 when an irrigation well was developed. Water for irrigation is derived from the Ogallala Aquifer. Since 2004, the ASC-Clovis has improved irrigation delivery by developing two center pivot irrigation systems and subsurface and surface drip irrigation systems.



Recent research has shifted from a heavy focus on irrigation to overall crop health. Specific areas of focus are:

Weed Resistance Management: Several studies are being conducted at the Center to evaluate resistant weed control and crop (corn, sorghum, and small grain) response to tank mixing several herbicides with a different mode of actions.

Variety Trials: Each year, the ASC evaluates several new and improved varieties of corn, sorghum, and small grain for grain and forage performance. Crop diversification with low water using, stress-tolerant alternative crops. Research has shown new crops such as winter canola, guar, safflower are ideally suited for the region to reduce water-use and offer economically viable alternative crop options.

Peanut Breeding: The ASC at Clovis is the only plant breeding center located off-campus, engaged in the development of Valencia peanuts. New Mexico is known for producing specialty type peanuts i.e., Valencia. About 60% of the Valencia peanut acreage is dominated by varieties developed by NMSU's Peanut breeding program. The most prominent varieties are Valencia – A, Valencia – C and NuMex-01 – a commercially available high oleic variety that benefits the New Mexico peanut industry. Overall, the Valencia peanut industry adds more than \$500,000 per year to the state economy.

ACES Pillars for Economic and Community Development

Food and Fiber Production and Marketing
Water Use and Conservation
Family Development and Health of New Mexicans
Environmental Stewardship

Foundational Education and Training

RESEARCH IMPACTS:

- The USDETC has proven to be a positive alternative or complementary education opportunity for students who have limited or no access to dairy courses or related learning experiences at their home universities. When asked “What impact did attending the consortium have on your current status,” 92% replied important, very important, or extremely important. When asked about the impact the classes and experiential learning had on their course work and subsequent careers, 44% replied extremely helpful, 35% very helpful, and 15% helpful. When asked to rank the consortium classes as compared to other courses taken, 55% gave the consortium an A+ and 36% an A.
- Understanding water use patterns of alternative crops under a range of water availabilities is essential to improve diversified cropping systems. Research on deficit irrigation management is focusing on rooting patterns, water extraction, and seed yield formation of different alternative crops under deficit irrigation strategies that can reduce competition with traditional crops for limited water and still improve the adoption of water-efficient alternative crops.
- The western U.S. has lost more than 50% of native biodiversity since we started cultivation, substantially reducing agronomic and ecosystem services. Crop diversification and cover crop research at ASC–Clovis revealed improvements in efficiency, profitability, and environmental quality in dryland and limited-irrigation cropping systems, which in the long-term could increase water use efficiency by up to 25% and improve the response of selected soil health indicators by up to 17%.

UNIQUE CHARACTERISTICS

- The ASC Clovis developed a novel concept to use underutilized parts of an irrigation system mechanism to grow native perennial grass mixtures in concentric circles of buffer strips to improve the water cycle of center-pivot irrigation. This improves water use efficiency and reduced irrigation withdrawal from the Ogallala Aquifer.
- The ASC Clovis is comprised of 156 acres of land at an elevation of 4,435 feet above sea level. The Olton clay loam soil is representative of a vast area of the High Plains of New Mexico and Texas, meaning the conditions here are difficult to replicate.



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