Agricultural Science Center at Clovis

The NMSU Agricultural Science Center at Clovis is centrally located in the largest crop production area of New Mexico. It is uniquely qualified to conduct agricultural research and producer outreach activities aimed at efficiently managing the area's limited water resources, improving soil health and increasing the economic viability and sustainability of agricultural production. It is the only research center focusing on dryland transition strategies and the only plant breeding center located off-campus and engaged in developing Valencia peanuts. The efforts to address the current challenges faced by reduced irrigation or dryland agriculture and prepare for future challenges will be critical as temperatures continue to rise and water becomes increasingly scarce.

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MISSION

The mission of the Agricultural Science Center at Clovis is to conduct crop, soil and water research, disseminate viable cropping strategies that benefit New Mexico's citizens and agricultural production, anticipate challenges and build vibrant relationships with stakeholders.

VISION

Advancing resilience and sustainability in semi-arid agricultural systems through research and innovations in soil health, water and carbon management.

VALUE ADDED TO NEW MEXICO

- New Mexico's peanut production is valued at over $11 million annually.
- Improved soil health and forage production with cover cropping increased milk production and quality.
- Conservation farming reduced soil erosion, resulting in enhanced air and water quality.
- Biochar has proven to be beneficial to NM farmers for increasing water infiltration, reducing gas emissions and improving organic matter storage.

Research Focus

Soil Health and Carbon Management: Soil organic carbon, SOC, is the foundation of soil health and sustainable agriculture. Researchers at the center are quantifying the impacts of conservation and regenerative farming practices on soil carbon storage, soil health, greenhouse gas (GHG) emissions and soil water storage in arid and semi-arid conditions. We are conducting field, greenhouse and laboratory studies to evaluate multiple aspects of regenerative practices to optimize resource use, sustain agriculture and improve farm profitability by mitigating climate warming and weather variability.

Valencia Peanuts Breeding: Valencia peanuts are mainly grown in eastern New Mexico and western Texas. Researchers at the center are developing Valencia peanuts with desirable characteristics, including flavor, seed size and pod structure. It aims for high oleic content to improve oil stability and shelf life, high yield and disease resistance to pod and stem rot. The selection of varieties is done based on traditional breeding, such as phenotypic screening, biochemical analysis, agronomic traits and modern technologies like market-assisted selections.

Machine Learning and Process-Based Models in Sustainable Agriculture: Recent advancements in artificial intelligence, specifically the application of machine learning and deep learning models in complex systems, show promise in their potential to address agriculture and climate change issues. Unlike process-based models, machine-learning models are data-driven and find patterns within datasets, parse linear and non-linear relationships between input and output variables and provide recommendations with high prediction accuracy. Researchers at the center have been evaluating multiple process-based and machine learning models to address key issues facing agriculture in New Mexico and their sustainability in arid and semi-arid regions.

Water measurement and management: Water is a lifeline of agriculture in arid and semi-arid regions, including New Mexico. Limited and highly variable precipitation, combined with declining groundwater resources in the Ogallala Aquifer, make efficient soil water management an urgent challenge for sustaining agriculture in eastern New Mexico. ASC Clovis researchers are evaluating multiple innovative farming practices, such as cover cropping, residue management practices, soil amendments and perennial cropping, to see their water use and conservation potential.

The College of Agricultural, Consumer and Environmental Sciences (ACES) is an engine for economic and community development in New Mexico, improving the lives of New Mexicans through research, teaching and extension.

New Mexico State University is an equal opportunity employer and educator. NMSU and the U.S. Department of Agriculture cooperating.

Recent Impacts

Researchers at the the Clovis ASC demonstrated cover crop-integrated silage cropping systems under no-tillage management, increasing soil organic carbon storage by 10-17% in four years of adopting no till management practices. Biochar reduced soil nitrous oxide emissions by up to 74%, reducing significant changes to the climate. Likewise, integrated perennial grasses as buffer strips between strips of irrigated annual crops increased soil organic carbon by 13% in six years of grass establishment.

New Mexico's peanut industry largely exists due to research conducted at the center. Varieties NuMex-01, NuMex-308, NuMex-309, NuMex-310, NuMex-KC-5, NuMex-M2, NuMex-M6, NuMex-7, and NuMex-PR-25, developed at the center, account for approximately 90% of the peanuts in the state today.

Accurately quantifying greenhouse gas emissions on farms is often costly, labor-intensive and difficult to scale. Empirical and process-based models can help estimate the emissions, but are complex and require extensive data. Researchers at the center tested machine-learning models to more accurately estimate emissions and identify the key factors driving them. The study found irrigation to be the major driver of CO2 and air temperature, the primary driver of N2O emissions in the cropping systems they studied. In addition, the machine learning approach enhanced the accuracy of estimating greenhouse gas emissions, helping to develop climate-smart farming practices and policies that reduce emissions and protect the environment.

NMSU Dairy Extension is the lead partner in the New Mexico AgrAbility Project (NMAP), one of the 21 states providing information and resources to enhance the quality of life for farmers, ranchers and other agricultural workers with disabilities. NMAP is currently working with a number of clients and was able to attract the National AgrAbility Program's National Training Workshop to Las Cruces (March 2025) to coincide with the opening of the Farm & Ranch Heritage Museum's AgrAbility Exhibit.

COMMUNITY ENGAGEMENT

The center plays a significant role in connecting NMSU with the farming community and the rural agricultural producers in the eastern part of the state. Every year, the ASC at Clovis hosts multiple community outreach events to inform industry partners, youth and local farmers about various projects and their results through numerous means. Field day is a major event that connects us with farmers, specifically showcasing our work and exchanging ideas on their needs and new research priorities. Moreover, the center, in collaboration with the local Cooperative Extension Services office, hosts the "Cultivating Young Minds" annual event. This event targeted fifth graders from schools in and around Clovis. During this event, students spend around one hour at the center and learn about soil, plants and where their food comes from. At the end, students go to the pumpkin field and pick one or two pumpkins to take home.

In addition, the center hosted researchers from Ireland, Northern Ireland and Morocco, as well as collaborators from the University of Delaware, as part of a research exchange visit and broader engagement with national and international partners on sustainable agriculture. This visit initiated an exchange of research ideas, strengthened our collaboration and increased the visibility of work at NMSU to a national and international community.