



Agricultural Experiment Station Agricultural Science Center at Artesia

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MISSION

The Agricultural Science Center at Artesia (ASC-Artesia) faculty conduct research and extension programs in soil, water, crop, and entomological sciences to enhance the agricultural, economic, environmental, and social well-being of southeastern New Mexico.

The ASC Artesia entomology group continues to address resistance to Bt genes as it is an issue for control of bollworm in corn and cotton.



Center researchers examine the prevalence of different species of kissing bugs as 64% in Southeastern NM are infected with a parasite (T. Cruzi).

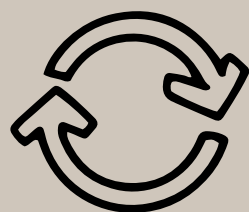


Approximately 75 acres are currently under cultivation, using sprinkler, drip and gated pipe irrigation systems supplied by an Artesian well.



Value Added to New Mexico

- Oil and Gas Wells



Artesia ASC faculty collaborate in local, regional, national, and international research and extension efforts, and are often asked to bring their expertise to colleagues and clientele across the U.S. and in foreign countries. The Center's goal is to be the premier off-campus center for novel research and extension programming in integrated pest management, water management, soil health, soil fertility and remediation, and the evaluation of new crop genetic material.

Ongoing Research

- **Manure Management:** New Mexico's 325,000 dairy cows produce ~6.825 million tons of manure. Most is land applied along with wastewater. New Mexico's Water Quality Commission requires groundwater monitoring. However, about two-thirds of all groundwater monitoring wells near dairies exceed state the state standard of 10 ppm NO3-N. Exceedances must be treated as mandated by the Groundwater Protection Act. Anion exchange remediation treatments cost \$32,000 per acre-inch of water. Yearly water treatment for a 2000-head dairy would approach 112AF/year (\$43M per year). Our soil test software optimizes nutrient rates from various sources to reduce potential nitrogen contamination and avoid extreme remediation expenses
- **Monitoring Resistance to Insecticides:** Resistance to pyrethroids in bollworm and alfalfa weevil in cotton and alfalfa hay in New Mexico.
- **BT Resistance:** Development of IPM tools to Control Bollworm
- **Variety Trials:** Direct farmers toward higher yielding or better-quality varieties that use less water be less susceptible to pests or reduce losses to salinity. Includes 12 varieties of cotton, 18 varieties of Sorghum, 2 varieties of corn
- **Developing Pest Management Tools for Controlling Insect Pests in Cotton:** Effect of Okra leaf Cotton on Cotton Bollworm
- **Biological Control of key pests:** Pecan nut casebearer and pecan weevil, in pecan, alfalfa weevil in hay and bollworm in cotton
- A field experiment was conducted at the Artesia, NM Agricultural Science Center to test the effect of saline irrigation water on several bioenergy crops.

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

The College of Agricultural, Consumer, and Environmental Sciences is an engine for economic and community development in New Mexico, improving the lives of New Mexicans through academic, research and Extension programs.

Recent Impacts

- Pest Management of Bollworm in the face of resistance to Bt Genes Widespread resistance to Bt genes prompted research to address this issue. Field and lab trials continue to evaluate the level of resistance in New Mexico populations of bollworm. Insect populations in Clovis were evaluated for resistance to pyrethroids in 2021 and populations in Artesia, Farmington and Las Cruces are being evaluated in 2022. Population dynamics of bollworm are being studied in Artesia and Las Cruces. Other potential tools to control insect pests are being evaluated. Okra leaf cotton, for example, has significantly lower survival of cotton bollworm, while maintaining the same population of beneficial arthropods.
- Kissing Bugs and potential health risks in NM: Faculty, staff and students determined that 64% of kissing bugs in SE New Mexico are infected with *T. cruzi* the parasite that causes Chagas disease. This is much higher than the 4% rate determined in the 1960s. Since rates of infection and species are likely to vary throughout NM, we are now collecting kissing bugs throughout New Mexico. In 2022, we have collected almost 500 kissing bugs that are being analyzed to determine species, rate of parasite infection and identification of blood meal host. While transmission of Chagas is expected to be low there is significant risk of allergic reactions in humans and some transmission of Chagas to dogs that are housed outdoors. This research will allow us to inform the public of any potential risk from kissing bugs and mitigation efforts, if needed, in various parts of New Mexico.
- Improving crops for the needs of New Mexico farmers through yield and crop quality Alfalfa is an excellent source of fiber and high in quality protein needed for most dairy cow diets. However, traits such as lignin, an indigestible phenolic compound in alfalfa cell walls that provides structure to the plant, but it is not digestible. The trait that is introduced into the genetics of alfalfa can increase fiber digestibility by 10% and decrease manure by 2.8M tons per year. Our mission is to assist breeders from campus and private companies to determine whether their genetics are applicable to NM growing conditions and soils. Alfalfa alone in NM garnered \$1.4 billion dollars in cash receipts in 2019. (NMDA 2019 Agricultural Statistics Bulletin).
- Biological Control of Insect Pests in Cotton, Pecan and Alfalfa High Value Crops Increased acreage in SE New Mexico prompted research to reduce insecticide applications on pecan nut case bearer with biological control by predators. Ghost spiders were identified as a key predator controlling up to 73% of insect pests in pecan orchards in the Pecos Valley. Control of pecan nut casebearer could save NM growers \$2.2 million per year. We are now conducting trials to look at the impact of predation on pecan weevil which is a key pest in Texas that continues to make incursions into New Mexico orchards. Damage by alfalfa weevil has increased in recent years in many areas of New Mexico. The ASC farm at Artesia has maintained good control of alfalfa weevil with biological control for 20 years.



Community Outreach

Every year the center conducts research and events that involve and serve the community. During the annual field day, this free event brings together the community to interact and share ideas about ongoing agricultural research projects. The Center also hosts the Entomology and Soils Workshop for 6th-grade STEM students allows participants to sweep alfalfa hay for insect pests. They also learn about soil types and identify insect pests in the field. Other events include:

- 4H Entomology insect collection workshops
- Park Jr. High School Ag Career Day
 - Two presentations were given by center employees on the Overview of Soils in New Mexico and the Importance of Soil Testing and Insects in our World and Careers in Entomology.
- New Mexico Ag Leadership (Leadership Discovery)

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