College of Agricultural, Consumer and Environmental Sciences
Agricultural Experiment Station

Sustainable Agriculture Science Center at Alcalde

NM STATE

Sustainable Agriculture Science Center at Alcalde

2025

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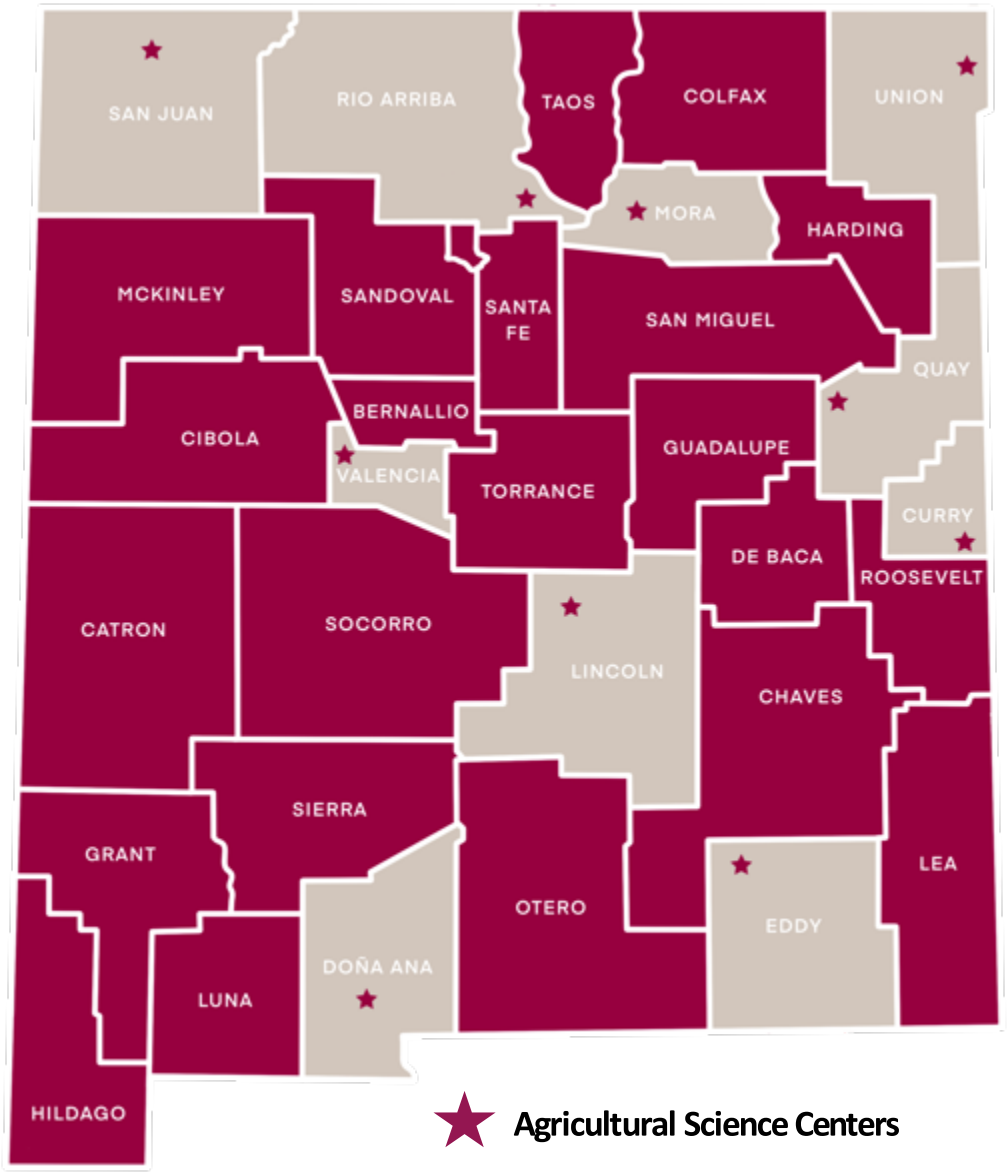
Agricultural Science Center Locations Map



Executive Summary

The Sustainable Agriculture Science Center (SASC) at Alcalde is a sixty-acre research farm situated seven miles north of Española. Extending from the Acequia de Alcalde to the Rio Grande, the center reflects the irrigated agricultural landscapes characteristic of the Rio Grande, Rio Chama, Rio Embudo, and other tributaries across north-central New Mexico. Although much of the acreage is dedicated to irrigated pasture and forage systems, the site also features diverse orchards and intensive, high-value crops and vegetable production areas. The mission of SASC is to conduct agricultural and natural-resource research on native and high-value crops, advancing sustainable and climate-smart practices that support the productivity and resilience of small family farms and ranches in north-central New Mexico.

Research at SASC emphasizes horticultural and agronomic crops, organic and regenerative production methods, acequia hydrology, and high-value alternative crops. Current research infrastructure includes jujube variety development and testing (2 acres), pome and stone fruit orchards (2 acres), table grapes (1 acre), pollinator habitat and buffer strips (3 acres), saffron production trials, and high-tunnel fruit and vegetable research (5,000 sq ft of covered growing space). The center also maintains 12 acres of forage crops, including alfalfa, red clover, western wheatgrass, Russian wildrye, smooth brome, tall fescue, and orchardgrass. An additional 6 acres are certified organic, with apples, peaches, and plums certified in 2025. These systems support long-term work on crop diversification, soil regeneration, and efficient water-use strategies for small farms.

SASC at Alcalde advanced agricultural innovation, regenerative crop production, and community-focused research in 2025, strengthening its role as a regional hub for applied research and producer education. Major accomplishments included restructuring the Advisory Committee by adding five new members and developing a new mission and vision framework to guide strategic growth.

Research and outreach expanded across saffron, chickpea, lavender, medicinal and essential-oil crops, jujube, pollinator habitats, and high-tunnel vegetables and berries—initiatives that improve the resilience of small farms facing water scarcity and climate pressures.

A key milestone was securing a Specialty Crop Block Grant from NMDA for “Quality Assessment of Lavender Cultivars' Essential Oil,” complementing ongoing saffron and chickpea projects and supporting multistate collaborations through NECC2103 and S1084. SASC-Alcalde also delivered a robust outreach program, hosting more than a dozen workshops, tours, field demonstrations, and community events, with additional visibility gained through media features and high-profile visits from NMSU leadership, industry partners, and regional Extension collaborators.

Overall, 2025 brought new funding, expanded research capacity, strengthened partnerships, and increased public engagement, reinforcing SASC-Alcalde’s role in advancing sustainable and regenerative agriculture in north-central New Mexico.

Research Highlights

Jujube Cultivar Trial

Principal Investigator: Shengrui Yao, yaos@nmsu.edu and Robert Heyduck

Project Overview: Researchers have collected/imported over 50 varieties at New Mexico State University Alcalde Center and established cultivar trials at NMSU Alcalde Center (2015), Los Lunas Center (2015), and Leyendecker Center (2017). Plantings at Alcalde, Los Lunas and Leyendecker are all growing and producing well. In 2025, they did not collect yield data but sampled cultivar fruit samples for metabolomic study, mainly at Los Lunas.

Meeting the Needs of New Mexico: Late frost is the most critical issue challenging fruit production in central and northern New Mexico. Most growers had five crops or fewer from 2010-2019. Good alternative crops with reliable yield are needed to diversify their operations and reduce risk. Jujube, also called Chinese date, adapts well to a wide range of soil and climate conditions. With its late-season start-up, same-year flower bud initiation and bloom, and two-month-long blooming period, jujube produces a reliable crop in New Mexico.

Impact: The limited choices of commercially available cultivars to the jujube industry will be greatly improved with the NMSU jujube project. There are currently only 5-6 jujube cultivars commercially available in the United States, of which 'Li' is dominant. The New Mexico State University Alcalde Center jujube program has been evaluating more than 50 cultivars in the past eight years and has identified 8-10 fresh-eating cultivars. Those cultivars will give growers nationwide more choices with extended maturation dates and achieve $1-2 premium per pound. The jujube acreage nationwide is expected to increase significantly.

Collaborating Agricultural Science Center: Los Lunas Agricultural Science Center and Leyendecker Plant Science Center

Jujube cultivar fruiting at Alcalde, 2025

Jujube Cultivar Selection Through Open Pollination Progenies

Principal Investigators: Shengrui Yao, yaos@nmsu.edu

Project Overview: There are limited commercially available jujube cultivars and no formally released jujube cultivar in the U.S. Based on our cultivar trials and existing jujube trees, jujube grow and produce well across New Mexico. Jujube breeding and selection are nonexistent in the U.S. Due to difficulties with jujube crossbreeding—tiny flowers, difficulty of emasculation, late flowering/fruit interference and low fruit set— NMSU Alcalde Center started the jujube cultivar selection through open-pollinated progeny in 2021. In the long run, we hope to select several US jujube cultivars. NMSU researchers have planted over 470 seedlings in 2021 and 2022 at Alcalde, and an additional 600 in Los Lunas in 2023. 900 seedlings were tagged for both locations in 2024. They evaluated fruit quality weekly from Sept -mid Oct and identified several promising selections in 2025. Four advanced selections were identified from 2024 to 2025.

Meeting the Needs of New Mexico: Late spring frosts challenge fruit production each year in central and northern New Mexico. To reduce risk and minimize revenue fluctuations, we encourage growers to diversify their operations. Because jujube blooms later than many traditional fruit crops, it can avoid late frost damage in most years and produce reliable yields annually. As a result, jujube is an excellent alternative crop for both commercial growers and home gardeners in New Mexico. Performance of our jujube cultivars at three locations over the past ten years has consistently demonstrated this reliability.

Impact: Like any perennial fruit species, jujube cultivar selection will be a long-term project that takes at least 8-15 years. Once jujube cultivar(s) are released, commercial growers nationwide can adopt them and generate more revenue with their operation. Home gardeners can also plant them in their yards and improve their food composition with jujube fruit.

Collaborating Agricultural Science Centers: Los Lunas Agricultural Science Center

A new jujube selection at Alcalde, NM.

High Tunnel Stone Fruit Production in Northern New Mexico

Principal Investigators: Shengrui Yao, yaos@nmsu.edu and Robert Heyduck

Project Overview: This study and demonstration will assess the feasibility of using high tunnels for frost protection of peach and cherry in northern New Mexico. Researchers planted peach and cherry in April 2017. They erected the main structure of 30 x 72-ft FarmTek high tunnel in 2018, and the plastic cover and doors and end panels were added in 2019. Researchers had nice peach crops from 2022-2025 but not sweet cherries. No data collection in 2025.

Meeting the Needs of New Mexico: Late spring frost is the most significant obstacle to tree fruit production throughout New Mexico. Growing trees under cover is one approach to mitigate this threat, and we used thermostat-controlled portable propane heaters and fans to provide additional heat in the system when needed. Simple automated systems may provide adequate protection at key points in tree and fruit development.

Impact: NMSU Researchers are working to determine the infrastructure, labor, and energy inputs required to protect tree blooms and produce a more reliable crop. Determining best practices and feasibility of different frost protection strategies can aid all fruit growers.

Funding Source: USDA Specialty Crop Block Grant through NMDA 2016-2019 at $27,600. Inactive.

Peach fruiting in high tunnel at Alcalde in 2025.

Table Grape Cultivar Trial at Alcalde

Principal Investigators: Shengrui Yao, yaos@nmsu.edu and Kevin Lombard

Project Overview: Due to severe late frosts in central and northern New Mexico, grape can be an alternative crop for fruit growers. Not all grape cultivars are adapted to the high pH soils common across New Mexico. The new growth of grapes can also be damaged by late frosts, but they can regenerate in the same year. The goal is evaluating table grape cultivars to recommend top-performing cultivars to growers. NMSU Researchers planted eight table grape cultivars in 2021 at Alcalde and are monitoring their growth and yield. Trellis system was installed in 2024. In 2025, plants were recovering but were still small, with no data collection.

Meeting the Needs of New Mexico: Unlike most pome fruit and stone fruit species, grapes can regenerate some new growth if they are damaged by late frosts and still generate some income for growers even in years with severe late frosts. For table grapes, most growers can market their fruit directly to local markets, which will increase their revenue. This table grape cultivar trial will be a demonstration for growers. Once we collect enough data, growers can adopt the recommended table grape cultivars in their operations.

Impact: Once we finalize this project and recommend top-performing table grape cultivars, local growers can plant them in their farms to minimize the late frost influence and increase revenue.

Collaborating Agricultural Science Centers: Farmington Agricultural Science Center and Los Lunas Agricultural Science Center

Don Caldwell speaks about table grapes.

Effects of Planting Time and Irrigation Treatments on Saffron Yield in Northern New Mexico

Principal Investigators: Saeid Zehtab Salmasi saeidzs@nmsu.edu and Lovepreet Singh

Project Overview: This project evaluates the feasibility of saffron (*Crocus sativus* L.) as a high-value, low-input crop for Northern New Mexico. Field trials were conducted in both open-field and high-tunnel systems using three planting dates and three irrigation levels. Measurements included flowering phenology, flower number, fresh flower weight, and stigma dry weight. Results from 2024 and 2025 showed strong effects of planting time on yield components, with early planting (mid-August) consistently producing the highest flower numbers and stigma yields across environments. In 2024, the highest mean stigma yield was 6.19 kg/ha under High Tunnel × T1 conditions, while in 2025 the highest mean yield was 5.70 kg/ha under Open Field × T1 conditions.

Meeting the Needs of New Mexico: New Mexico's small-scale growers face increasing water limitations and require alternative crops that provide high economic returns with minimal resource input. Saffron, adapted to dry climates and cold-hardiness zones 5–9, aligns well with these needs. The crop also complements the region's cultural heritage of medicinal and specialty herbs. This project directly serves New Mexico farmers by identifying optimal planting times and management practices that maximize yield and reduce water use. By testing saffron under both open-field and protected-culture conditions, the research builds a pathway for diversification and resilience in local agricultural production systems.

Impact: Research conducted during 2024–2025 demonstrated that saffron can successfully establish and produce commercially meaningful yields in Northern New Mexico. Planting time emerged as the most significant factor influencing yield, with mid-August plantings consistently outperforming later dates in flower production, stigma biomass, and overall yield. Irrigation level and environment (high tunnel vs. open field) had comparatively minor effects, indicating saffron's suitability for low-input production systems. The project provides science-based recommendations that reduce production risk for growers interested in adopting this high-value crop. With the U.S. saffron market valued at $360 million in 2023 and significant reliance on imports, New Mexico producers have an opportunity to develop niche markets. These findings have been shared through field days, outreach events, and grower consultations to support regional economic development.

Graduate Students / Post Docs: One graduate student (Lovepreet Singh)

Saffron flowers in open field and hoop house in Alcalde.

Integrating Saffron into Small Vegetable Production Systems of New Mexico to Enhance Profitability and Sustainability

Principal Investigators: Saeid Zehtab Salmasi, saeidzs@nmsu.edu, Marisa Thompson, Chanz Robbins, Ivette Guzman, Sawssan Boufous, Lovepreet Singh

Project Overview: This project tests the feasibility and benefits of integrating saffron (*Crocus sativus* L.) with summer vegetables in small-scale systems. At Alcalde (2025), the researcher installed replicated plots comparing sole crops, Saffron (S), Chile (C), Mustard (M), with intercrops, Saffron+Chile (SC) and Saffron+Mustard (SM). They recorded saffron flowering, fresh flower weight, and stigma dry weight across sequential harvests in October–November, and summed multiple harvests for chile and mustard. Saffron's fall–winter growth complements summer vegetables, enabling two crops to occupy the same bed over a year with modest additional inputs. The project pairs agronomic measurements with grower trainings, field days, and media to support on-farm adoption.

Meeting the Needs of New Mexico: Small farms in Northern New Mexico operate under water limitations, short seasons, and tight margins. Saffron fits this context as a low-input, high-value crop that grows in the fall/winter window, potentially raising annual revenue per bed when paired with summer vegetables. By quantifying yield in sole vs. intercropped plots and demonstrating practical steps (planting, irrigation timing, harvesting, processing), this project offers actionable diversification for underserved and beginning growers. Planned workshops and field days at NMSU's ASCs, along with a short video and extension materials, translate research results into practical guidance that can be implemented in local production systems.

Impact: The 2025 Alcalde trial generated replicated, plot-level data showing that saffron can be integrated with summer vegetables while maintaining meaningful saffron output and capturing vegetable yield from the same footprint. Averaged across reps, saffron stigma dry weight (per plot) was highest in sole saffron (S) at 0.502 g/plot, followed by SM at 0.465 g/plot and SC at 0.365 g/plot; flower counts and fresh flower weights followed the same rank order (S ≥ SM ≥ SC). Across multiple harvests, chile delivered the highest fruit yield (mean 9,541 g/plot) with SC at 7,480 g/plot; mustard averaged 4,825 g/plot with SM at 4,253 g/plot. These results indicate intercropping can retain a substantial share of vegetable yield while adding saffron stigma yield, extending bed productivity into the fall–winter season. Combined with outreach and enterprise budgeting in the SCBGP project, this supports profitability and resilience for small, water-limited farms.

Graduate Students / Post Docs: One graduate student (Lovepreet Singh)

Collaborating Agricultural Science Centers: Leyendecker Plant Science Center and Los Lunas Agricultural Science Center

Funding Source: USDA Specialty Crop Block Grant Program (SCBGP) via New Mexico Department of Agriculture, $78,837.80 from Oct 2024-Sept 2027.

Saffron, chile and mustard intercropping plots in Alcalde.

Development of an Organic Saffron Corm Production System in Northern New Mexico

Principal Investigators: Saeid Zehtab Salmasi saeidzs@nmsu.edu and Lovepreet Singh

Project Overview: This project evaluates certified-organic production strategies for saffron (*Crocus sativus* L.) corm propagation, focusing on how corm size (C1 small vs. C2 large) and four organic fertility treatments—control, Alaska Fish 5-1-1, Happy Frog 7-5-3, and Nurture Growth, affect flowering, stigma yield, and daughter-corm multiplication. Around 5,000 corms were eplanted on August 19, 2025. Flowering occurred from late October through early November, with detailed stigma yield data collected across multiple harvest dates. The goal is to build a domestic, certified-organic corm supply system, reducing dependence on imported corms and supporting specialty-crop profitability.

Meeting the Needs of New Mexico: New Mexico farmers face high costs and supply-chain risks associated with importing saffron corms, which typically cost $0.30–$1.20 per corm and may lack reliable organic certification or size grading. Developing an in-state organic propagation system can lower entry costs, support small-scale diversified farms, and stimulate a new high-value crop enterprise. Because saffron thrives in semi-arid regions and requires minimal inputs, it is well-suited to New Mexico's climate and water-limited production systems. This project helps address a major barrier to scaling saffron acreage, lack of certified organic planting stock, while supporting economic opportunities for specialty-crop growers.

Impact: The 2025 on-farm corm-production trial at Alcalde generated the first systematic dataset on organic saffron corm propagation in New Mexico, demonstrating that flowering occurred from October 22–27 into early November and that large corms (C2) consistently produced higher stigma dry weight than small corms (C1) across all organic fertility treatments. Total stigma dry-weight production translated to approximately 1.8–3.4 kg/ha, confirming that corm size is the dominant factor influencing productivity during establishment, with fertilizer effects playing a secondary role. In June 2026, daughter corms from all treatments will be excavated, size-graded, quantified, and replanted, enabling a full second-year evaluation of multiplication rates and organic fertility effects on marketable corm production.

Saffron corm production plots in Alcalde.

Chickpea, a High Value, Low Input Sustainable Specialty Crop for New Mexico

Principal Investigators: Saeid Zehtab Salmasi, saeidzs@nmsu.edu, Murali Darapuneni, Koffi Djaman, Frennie Miller, and Lovepreet Singh

Project Overview: This project evaluates chickpea (*Cicer arietinum* L.) as a high-value, low-input specialty crop for semi-arid New Mexico by testing two planting times (Early vs. Late), two cultivars (Dylan, Nash), and three irrigation regimes (Low, Medium, High). Trials are established at NMSU Agricultural Science Centers, with 2025 yield data compiled for Alcalde. We record grain yield (standardized to kg/ha and lb/ac) to compare cultivar performance under increasing water supply and seasonal windows. Preliminary 2025 results show highest yields under High irrigation, with cultivar-specific responses by planting time. Extension activities (workshops, field days, and a fact sheet) support grower adoption and climate-smart diversification.

Meeting the Needs of New Mexico: With limited arable land and chronic water deficits, New Mexico farms require crops that use water efficiently, fix nitrogen, and access protein markets. Chickpea is adapted to cool-season growth, tolerates heat and drought better than many pulses, and provides rotational benefits (biological N fixation, pest cycle breaks). The project's side-by-side comparison of planting time × irrigation × cultivar equips growers to target profitable, water-smart production windows. Outreach (field days across ASCs; workshops; applied budgets) ensures knowledge transfer to underserved and beginning farmers, aligning with food-security and farm-profitability goals statewide.

Impact: The 2025 data from Alcalde demonstrate strong irrigation and timing effects with clear cultivar differences. Under High irrigation, Dylan reached 1,390 kg/ha with Early planting and 1,420 kg/ha with Late planting, while Nash achieved 930 kg/ha (Early) and 2,030 kg/ha (Late), the seasonal best, indicating Nash's advantage in late planting under ample water. These results suggest (1) the highest returns occur with High irrigation, (2) Late–High favors Nash, while Dylan performs consistently well at Early–High, and (3) meaningful yields are still possible at Medium irrigation, informing climate-smart decisions for semi-arid farms. The experiment will be repeated in 2026 to validate these patterns across seasons.

Collaborating Agricultural Science Centers: Farmington Agricultural Science Center and the Rex E. Kirksey Agricultural Science Center at Tucumcari

Funding Source: USDA Specialty Crop Block Grant Program (SCBGP) via New Mexico Department of Agriculture, $70,916.62 from Oct 2024-Sept 2027.

Chickpea planting times and irrigation treatment plots in Alcalde.

S1084: Industrial Hemp Production, Processing, and Marketing in the U.S.

Principal Investigators: Saeid Zehtab Salmasi saeidzs@nmsu.edu and Lovepreet Singh

Project Overview: This multistate S1084 project supports coordinated national research on industrial hemp (*Cannabis sativa* <0.3% THC) production systems. At NMSU–Alcalde, we evaluated multiple cultivars for plant height, fresh biomass, dry matter content, and dry yield to inform cultivar selection and agronomic management for diverse end uses. Research focuses on linking breeding, genetics, and cropping system development to advance sustainable hemp production. The 2025 trials included 10+ cultivars with four replications, revealing substantial variability in height (3.6–8.2 ft) and dry yield (780–5,740 kg/ha). These data help guide cultivar recommendations for New Mexico's semi-arid conditions and emerging hemp markets.

Meeting the Needs of New Mexico: Following federal legalization in 2018, New Mexico growers showed strong interest in hemp, yet research gaps remain due to decades of regulatory restrictions. The S1084 project directly addresses these gaps by generating science-based information on cultivar adaptation, production practices, quality traits, and THC compliance. This work benefits New Mexico producers by identifying cultivars with stable biomass production, low THC levels, and suitability for fiber, grain, or cannabinoid markets. These data support diversification options for small and mid-scale farmers, while contributing to climate-smart agriculture through improved water efficiency, soil health benefits, and expanded specialty-crop economic opportunities.

Impact: The 2025 cultivar evaluation at Alcalde demonstrated large differences in biomass and dry yield, critical for selecting hemp varieties adapted to Northern New Mexico. Across four replications, Jinma produced the highest mean dry yield (5,740 kg/ha), followed by Shama (4,730 kg/ha) and Yuma (4,480 kg/ha). Low-yielding cultivars included Vega (780–1,100 kg/ha) and Anka (800–2,000 kg/ha). THC values from standardized tests remained compliant (<0.3% THC), with cultivars such as Anka and Santhica 70 at 0% THC, and AST Genetics at 0.26%, confirming suitability for regulated production. The project provides U.S.–wide research coordination, shared data standards, pest/disease insights, and economic tools. Locally, our 2025 results deliver actionable cultivar recommendations to growers entering hemp-based fiber and industrial markets, reducing production risk and improving statewide competitiveness.

Funding Source: This is a multistate S1084 regional research project supported through the NIFA multistate research system. No separate direct grant funding was awarded to the Alcalde site beyond baseline AES support.

Industrial hemp cultivar trial in Alcalde.

Expanding Organic Systems to Reduce Water Demand and Increase Agricultural Resilience in the Southwest

Principal Investigators: Alexander Fernald, Connie Maxwell, alamosa@nmsu.edu, Kevin Lombard, Ivette Guzman, Jay Lillywhite, Saeid Zehtab Salmasi, Rob Heyduck, Richard Davidson, and Don Bustos

Project Overview: The goal of the project is to develop tools and practices for dryland or minimally irrigated organic specialty crop production to address current and future water shortages in New Mexico and throughout the Southwest. In 2024, we established trials of nine species of medicinal herbs under organic management and drip irrigation to assess these species growth and production under three irrigation treatments. Soil moisture monitoring equipment was installed in late summer 2024, and plant growth, soil moisture, and climatic data were collected in 2024 and 2025. Also, in 2024, a trial of five native shrub species was planted as two functional hedgerows. Dead plants were replaced in 2025 and we continue to assess their survival and growth.

Meeting the Needs of New Mexico: Climate change is resulting in lower average winter snowpack as well as earlier and reduced spring runoff and this imposes challenges to irrigated agriculture throughout the state. Organic management has the potential to mitigate some of these challenges and make the most use of available water. Organic production of specialty crops and development of specialty food and medicinal products also can enhance the income stream of small farmers in the region.

Impact: The USDA-NIFA Organic Transitions Program supports research and extension that improves the competitiveness of organically raised crops and livestock. This project aims to explore new crops suited to our arid and semi-arid environments, develop management strategies that save water, and encourage economic and ecological sustainability for small farms.

Collaborating Science Centers: Fabian Garcia Science Center and Farmington Agricultural Science Center

Funding Source: USDA-NIFA Organic Transitions Program Award No. 2022-51106-38025, $750,000 total, ~$23,000 for Alcalde based activities. 2022-2026. Active.

Evening primrose, clary sage, and marshmallow are visible in medicinal herb trial.

Selecting Adapted Cultivars Of Lavender For Northern New Mexico

Principal Investigators: Robert Heyduck rheyduck@nmsu.edu, and Kevin Lombard

Project Overview: Continuing work done previously at Alcalde, we initially planned to grow a wide range of open-pollinated lavender progeny from which to select promising individuals based on initial growth and survival, flower yield, and essential oil yield and quality. Germination of collected seed was poor and plant numbers from this seeding were not high enough to proceed. In 2024, we planted a small variety trial of rooted cuttings. This trial will provide a newer planting for learning about lavender production and management and for material for essential oil quality testing in the future. Some plants were also planted at the Santa Fe County Extension Office demonstration garden.

Meeting the Needs of New Mexico: Lavender is a crop with long historic use and broad popularity. While not native to New Mexico, it grows well in most parts of the state, does well on alkaline, sandy, and low-fertility soils, and is drought tolerant. Cold tolerance is an important trait for northern areas with colder, longer winters, and demand is increasing for cultivars that are both drought and cold-tolerant.

Impact: Lavender is popular with homeowners and is the basis of several New Mexico-based businesses. Continuing research on production, quality, and value-added products benefits many New Mexicans.

Collaborating Science Centers: Farmington Agricultural Science Center

Funding Source: $28,650 from New Mexico Department of Agriculture as part of the Specialty Crop Block Grant Program. Completed.

Lavender variety trial, plus other herbs.

Magnitude of Linuron Residue on Dry Bean

Your Name and Email Address: Chanz Robbins chanz@nmsu.edu, Kari Arnold (UC Davis), Matt Hangel (UC Davis), and Jerry Baron (NC State)

Project Overview: This project consisted of a field phase study of the magnitude of residue research of linuron on dry bean. Here, we investigate how much residue will potentially be left on crops after harvest to determine whether the crop is safe for consumption. Kidney beans of the Cabernet variety were grown under normal agricultural conditions to maturity. This experiment consisted of two plots, a treated and an untreated plot. The treated plot was sprayed with the herbicide linuron and then the crop was grown to maturity before beans were harvested and samples shipped to an indepent laboratory for testing.

Meeting the Needs of New Mexico: Traditionally, dry beans and other lentils play a major role in Southwester diets and culture. The importance of this project to New Mexico is to obtain registration of linuron in dry bean cultivation for growers. NM producers of dry beans obtaining a new weed control chemical in their pest management tool kit, will potentially allow for more economical production of beans reducing the need for mechanical cultivation and/or contract labor as production costs increase. The addition of a new mode of action additionally enables producers to more effectively combat resistance in their fields and realize more sustainable production practices.

Impact: Linuron products are not registered for dry or succulent bean production, but a need for new herbicide modes of action are present and readily expressed by producers. This trial contributes data to a Nation-wide project to analyze and determine the potential residues on bean crops grown to commercial maturity. Samples will be analyzed using LC-MS methods and data will be submitted to EPA for pesticide registration approval. After the approval process, the crop will be added to the pesticide label to allow legal use in succulent and dry bean production.

Linuron residue on dry bean plots in Alcalde.

Crop Safety of Dimethenamid-P on Chile

Your Name and Email Address: Chanz Robbins, chanz@nmsu.edu

Project Overview: The purpose of this project is to evaluate the crop safety of dimethenamid-p herbicide treatment on chile plants and yield. Chile was direct seeded and grown to commercial maturity under normal production methods. Plants were treated prior to emergence and again two weeks later. There is a need for more herbicide control methods both to combat resistant weed species and to reduce labor costs. Treatment showed inconsistent effects that may be related to either soil type or application timing. This requires reevaluating an application use pattern to develop more consistent, reliable results.

Meeting the Needs of New Mexico: Growing chile in New Mexico is considered both culturally and economically a very significant part of Southwest traditions. Chile production has historically relied heavily on cheap labor to weed, maintain, and harvest chile fields. As labor dynamics change and input costs increase, growers need a modern arsenal of pesticides to meet their pest management needs. Additionally, herbicide resistance in weed species continually increases and results in either ineffective application or increasingly higher rates of herbicides in the environment. This project is necessary to ascertain whether the herbicide dimethenamid-p can be safely used in chile production to reduce resistance and increase sustainable chile production for New Mexicans.

Impact: Labor costs have significantly increased for farm operations while gross profit remains stable or even variable from year to year, making food production very unstable. In addition, herbicide-resistant weed species continue to increase in agricultural fields, due to limited herbicide options or overreliance on a select few products. This project attempts to address this problem by testing if an unregistered herbicide can be safely used on chile with no effects on phytotoxicity or yield. Results indicate the split application may be injurious once plants emerge. Testing of either a higher rate prior to emergence or a second application after plants become more established will need to be tested further.

Chanz Robbins speaks about herbicide trials on beans and chile.

Research Publications, Sponsored Projects, and Outreach

Outreach Activities

- February 25, 2025 — Fruit Tree Pruning Workshop
  Hands-on educational workshop focused on proper pruning techniques for orchard tree health and productivity.

- March 6, 2025 — Annual Fruit Growers Workshop
  Outreach event providing producers with updated research, management practices, and specialty crop information.

- June 2, 2025 — Visit from Summit Garden Club (Los Alamos County)
  Educational tour and discussion on specialty crops, regenerative agriculture, and ongoing research initiatives.

- June 19, 2025 — Visit from Eric Meltzer, CEO of Pennsylvania Saffron Co.
  Industry engagement and demonstration of saffron research, including mechanized harvesting technologies.

- June 19, 2025 — Bindweed Management Workshop
  Delivered by Dr. Leonard Lauriault, focusing on integrated weed management strategies for bindweed.

- July 2, 2025 — Visit from Kiau Technologies Co.
  Hosted a research-oriented delegation exploring advanced agricultural tech and sensor-based systems.

- July 16, 2025 — Visit of NMSU President Dr. Valerio Ferme and ACES Leadership
  Hosted a 20-member delegation including the Dean of ACES, highlighting SASC research, facilities, and strategic initiatives.

- July 21, 2025 — Visit from Pojoaque High School Student Group
  Youth-oriented educational tour introducing students to specialty crops, regenerative farming practices, and career pathways in agriculture.

- August 14, 2025 — Alcalde Field Day
  The center's signature public outreach event featuring field tours, research demonstrations, and presentations on jujube, saffron, chickpea, lavender, table grapes, and other specialty crop projects.

- August 20, 2025 — Visit from Santa Fe Master Gardeners
  Engagement focused on orchard management, specialty crop trials, and high-value regenerative agriculture systems.

- October 9, 2025 — Advisory Committee Meeting
  Annual convening of committee members to review center progress, discuss strategic priorities, and strengthen stakeholder alignment.
- October 22, 2025 — Saffron Harvesting & Processing Workshop
  Hands-on workshop demonstrating harvesting techniques, flower handling, stigma separation, drying, and quality considerations.

- October 22, 2025 — Educational Video Session: "Saffron Production and Processing for New Mexico Farms."
  Filming and outreach session to create statewide educational media for growers.

- November 6, 2025 — Visit from Santa Fe New Mexican Reporter Alaina Mencinger
  Hosted the reporter and photographer team for an in-depth feature story on saffron research and producer impact.

Figure 1- Shengrui Yao speaks for visitors from Summit Garden Club (Los Alamos County)

Figure 2- Visit of NMSU President Dr. Valerio Ferme and ACES Leadership

Figure 3- Visit from Pojoaque High School Student Group

Figure 4- Saeid Zehtab Salmasi and Charles Martin speak about lavender and medicinal herbs in Field Day

Figure 5- Saffron Harvesting & Processing Workshop

People and Partnerships

Cooperators and Collaborators

Collaborating Main Campus (and other ASC) Faculty & Staff

- NMSU Science Centers and Researchers
- Dave Lowry—Leyendecker ASC
- Dr. Kevin Lombard—Farmington ASC
- Dr. Chadelle Robinson—Agricultural Economics and Agricultural Business
- Dr. Efren Delgado—Family and Consumer Sciences
- Dr. Nancy Flores—Food Technology
- Dr. Alexander Fernald—Water Resources Research Institute
- Dr. Connie Maxwell—Water Resources Research Institute
- Dr. Ivette Guzman—Plant and Environmental Sciences
- Dr. Murali Darapuneni— Rex E. Kirksey Agricultural Science Center at Tucumcari
- Dr. Kuffi Djaman—Agricultural Science Center at Farmington
- Dr. Marisa Thampson—Agricultural Science Center at Los Lunas
- Dr. Fronnie Miller—Agricultural Economics and Agricultural Business
- Dr. Sawssan Boufous—Agricultural Economics and Agricultural Business
- Dr. Joanie King —Extension Entomology Department
- Dr. Chuck Havlik—Northern Pueblo Agriculture Agent
- Donald Cadwell—Wine Extension Specialist
- Chanz Robbins—IR4 Program Manager, Extension Plant Sciences
- Donald Martinez—Rio Arriba Extension Agriculture Agent
- Thomas Dominguez—Santa Fe Extension Agriculture Agent
- Will Wright-Jaremko— Taos Extension Agriculture Agent
- Charles Martin—Retired from SASC at Alcalde, Willowcreek Farm
- NMSU School of Hotel, Restaurant, and Tourism Management
- Chile Pepper Institute
- New Mexico Department of Agriculture
- New Mexico Acequia Association
- New Mexico Chile Association
- New Mexico Fresh Water Drinking Bureau
- Alcalde Acequia Association

S1084 Collaborators

- University of California
- Purdue University
- University of Florida
- Alabama A&M University
- Pennsylvania State University
- University of Vermunt
- Michigan State University
- University of Wisconsin
- Southern Illinois University
- Washington State University

- Kansas State University
- University of Tennessee
- Louisiana State University
- University of Kentucky
- Colorado State University
- Montana State University
- Cornell University
- North Carolina State University

NECC2103 Collaborators

- University of Illinois
- Utah State University
- University of New Hampshire
- Pennsylvania State University
- University of Florida
- University of Minnesota
- Purdue University
- North Dakota University
- University of Maine
- Ohio State University
- University of Massachusetts
- University of Arkansas
- University of Vermont
- Cornell University

NMSU, University, State, and Federal Collaborations

- University of California
- Purdue University
- University of Florida
- Alabama A&M University
- Pennsylvania State University
- University of Vermunt
- Michigan State University
- University of Wisconsin
- Southern Illinois University
- Washington State University
- Kansas State University
- University of Tennessee
- Louisiana State University
- University of Kentucky
- Colorado State University
- Montana State University
- Cornell University
- North Carolina State University

NECC2103 Collaborators

- University of Illinois

- Utah State University
- University of New Hampshire
- Pennsylvania State University
- University of Florida
- University of Minnesota
- Purdue University
- North Dakota University
- University of Maine
- Ohio State University
- University of Massachusetts
- University of Arkansas
- University of Vermont
- Cornell University

Industry & Tribal

- Taos Soil and Water Conservation District
- Taos Chapter Native Plant Society
- Los Alamos National Laboratory
- Eight Northern Pueblo's Peacekeepers of Domestic Violence
- East Rio Arriba Soil and Water Conservation District
- Kiau Technologies

Advisory Committee

- Don Bustos
- Bobby Lopez
- Christopher Bassett
- Donald Martinez
- Leonard Bird
- Craig Conly
- Charles Havlik
- Melanie Delgado
- Mary Lucero
- David Lucero
- Jacob Torres

ASC Personnel

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David Archuleta — Farm/Ranch Manager

Gary Maestas
Assistant Farm/Ranch Manager

Lovepreet Singh
Graduate Student