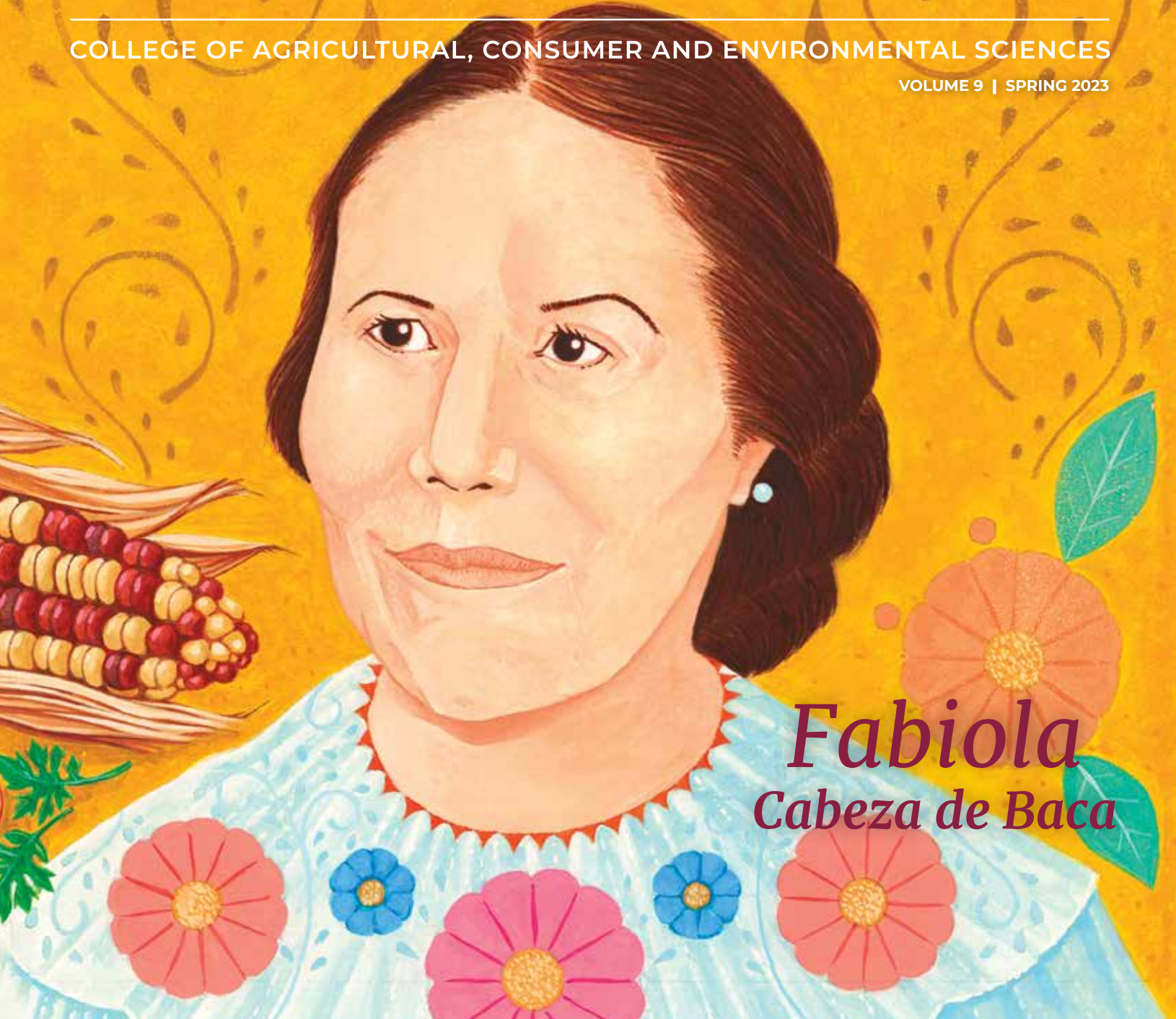


ACES MAGAZINE

COLLEGE OF AGRICULTURAL, CONSUMER AND ENVIRONMENTAL SCIENCES

VOLUME 9 | SPRING 2023



*Fabiola
Cabeza de Baca*

FROM THE DEAN

Dear Aggies and friends across our community,

We are delighted to bring you our spring edition of *ACES Magazine*. In this issue, you will learn how the College of ACES is contributing to the economy of New Mexico and the education and well-being of New Mexico residents.

One story looks at a research project examining the practicality of virtual fencing technology for livestock. Preliminary results show this technology may improve the sustainability of ranching and beef systems in New Mexico and the Southwest. Another story features one of our brightest students who is working toward a goal to help Native American communities through education and research.

In our cover story, we pay homage to a pioneering educator, Fabiola Cabeza de Baca. The first Spanish-speaking agent to serve in NMSU's Cooperative Extension Service, Fabiola took Extension education to rural and pueblo communities across New Mexico, reaching an untold number of people during her career. Her dedication to educating the people of New Mexico is an inspiration to me and countless others.

Last year, we sadly said goodbye to one of our most beloved professors, Neil Burcham. He touched many lives over his 48-year career at NMSU and had a lasting impact on the livestock industry.

On a happier note, we welcome Dr. Alan R. Shoho to NMSU as our new provost. Our college is ready to work with Dr. Shoho as he begins to strengthen academic programs across the NMSU system.

Thank you all for your support. Please stay in touch.

Rolando A. Flores Galarza
Dean and Chief Administrative Officer



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SPRING 2023

On the cover

A watercolor and gouache portrait of Fabiola Cabeza de Baca painted by Albert Vasquez of NMSU's Marketing and Communications.



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Construction will wrap up this summer on NMSU's new Food Science Learning and Safety Center, seen here, and feed mill. The buildings represent an initial investment in modernizing the agricultural district on NMSU's Las Cruces campus.

Josh Bachman

NEAR THE FINISH LINE

Construction to wrap up soon on facilities built to provide modern learning spaces

BY AMANDA BRADFORD

Two new buildings opening this summer at NMSU have already changed the skyline in southern Las Cruces, and they'll soon change the face of education in the College of ACES.

The completion of the buildings – the Food Science Learning and Safety Center and a feed mill – represents an initial investment in modernizing and expanding the southwestern agricultural district on NMSU's Las Cruces

campus. The buildings will be ready for students, faculty and staff later this fall. "Enhancements to education and research are critical for New Mexico's agricultural workforce to best advance the



Josh Bachman

The feed mill, above, and the Food Science Learning and Safety Center, right, are part of the first phase of a project funded by general obligation bonds approved by New Mexico voters in 2018 and 2020. Another facility, a biomedical research building, is wrapping up the first of three phases.



Josh Bachman

industry and grow the state's economy," University Architect Heather Watenpaugh said. "For the Las Cruces campus, these structures are symbolic of additions that celebrate our uniqueness, geographic location and core contribution in the region."

The buildings are part of the first phase of a project funded by general obligation bonds approved by New Mexico voters in 2018 and 2020. Another facility, a biomedical research building, is wrapping up the first of three phases. Its next phase will include an interior fit-out, followed by a final phase, supported by a \$7.1 million grant from the National Institutes of Health. The grant will allow the facility currently under construction to be expanded to support additional resources originally envisioned for a wild animal research facility.

Shanna Ivey, head of the Animal and Range Sciences and Extension Animal Sciences and Natural Resources departments, said the impact of the new facilities couldn't be overstated.

"These buildings are the biggest thing to happen in the College of ACES in years," Ivey said. "These facilities are going to be state of the art. Our students deserve these new buildings, and we are so excited to start using these resources. They will not only benefit our students but also our youth- and adult-learning programs."

Donald Conner, associate dean and director of Academic Programs for the college, said the new facilities will be transformative in enhancing the college's efforts in the land-grant missions of teaching, research and extension.

"The design of each of these buildings is very intentional to facilitate student learning, practical and basic research, and training of industry personnel," Conner said. "I believe our undergraduate and graduate

students, as well as our ACES stakeholders, will benefit greatly from these new facilities for years to come."

Though not the tallest building on campus – that distinction belongs to another ag building, Skeen Hall – the new feed mill is a strikingly vertical structure that's visible from Interstate 10. Watenpaugh said planners are looking at ways to highlight the building's vertical nature and use it to visually emphasize the university's agricultural roots.

"These facilities will be a game changer for ACES, NMSU and New Mexico," College of ACES Dean Rolando A. Flores Galarza

said. "They will benefit student education and facilitate labor training for the meat and food industry — thus, directly impacting the food safety of our agricultural products."

The college will host a ribbon-cutting ceremony to celebrate the new buildings later this year.

MISSION ABROAD

ACES faculty and staff amp up efforts to recruit international students

BY CARLOS ANDRES LÓPEZ

Erika De La O and others from the College of ACES have traveled hundreds of miles outside the United States, touting the perks of NMSU to recruit more international students.

De La O, a planning officer, was one of several representatives from the College of ACES who crisscrossed Chihuahua state in Mexico last fall to engage with hundreds of potential students at three agricultural expos in Ciudad Juárez, Delicias and Chihuahua City. The recruiting team also included Patricia Cabral, Efen Delgado, Heber Lara and Yesenia Palma.

The endeavor was part of coordinated efforts by the College of ACES to recruit more international students to NMSU. In addition to Mexico, ACES faculty and staff have carried out recruitment activities in India, China, South Africa, the United Arab Emirates and other Latin American countries.

“We delivered the mission of the College of ACES while providing information about scholarships and all the resources we



College of ACES Dean Rolando A. Flores Galarza, center, and others from NMSU met with a group of educators from the Universidad Autónoma de Ciudad Juárez during the 2022 Feria Expo Ganadera in November. From left, Guadalupe Alejandra Cardoso Mendiola, Yadira Isela Marquez Gonzalez, Ramon Rivera Barreno, Erika De La O, Flores Galarza, Tania Hernandez Garcia, Salvador David Nava Martinez and Eduardo Medina.

can offer to international students,” De La O said. “I’m proud to say we recruited five students. You can see the enthusiasm in their eyes. They’re not only very passionate

about coming to the United States, but they’re also truly eager to study at NMSU.”

One of those students was Omar Sigala. Sigala, who is from Chihuahua City, met

Representatives from the College of ACES speak with attendees at the 2022 Expo Agro Alimentab Internacional in Chihuahua City in September as part of an effort to recruit more international students into the college. The representatives also visited expos in Ciudad Juárez and Delicias.



De La O at the Feria Expo Ganadera in Ciudad Juárez. Before meeting De La O, Sigala believed attending college in the U.S. was financially impossible.

“A friend told me about NMSU in high school, and I always thought it would be too expensive,” he said, “but I learned that’s not the case.”

Following the expo, Sigala decided NMSU would be the perfect place to study animal science and prepare him for veterinary school. He moved to New Mexico last fall and began working on a bachelor’s degree.

“I’m really happy I came here – I’ve been enjoying this adventure,” said Sigala, now in his second semester at NMSU. “I think other international students should consider coming to NMSU. It can be difficult, but there are people like Erika who will help you and make you feel like you’re not alone.”

Last year, dozens of high school and college students from Mexico visited NMSU as part of additional recruiting efforts coordinated by the ACES Global Initiatives Program. Following the visits, seven high school students applied to undergraduate programs in Animal and Range Sciences and Plant and Environmental Sciences, and five college students expressed interest in applying to graduate programs in the same departments.

Manoj Shukla, director of the ACES Global Initiatives Program, said the college is also developing a Ph.D. program for



college educators in Mexico. The program would allow those with a bachelor’s or master’s degree to pursue a Ph.D. at NMSU.

Shukla added that the college has joined a European Union mobility program with Mendel University in Brno, Czech Republic. The program facilitates student exchanges between Mendel University and NMSU, he said.

“Now more than ever, it is important for our college to think globally and make an effort to attract more international students,” College of ACES Dean Rolando A. Flores Galarza said. “This will put NMSU in a better position to solve our most pressing scientific issues and help the people of New Mexico and beyond by fostering international trade.”

ECONOMIC BOOST

Jay Lillywhite tapped to lead effort to spur business growth in state's rural communities

BY CARLOS ANDRES LÓPEZ

To help bolster New Mexico's economy, the College of ACES has enlisted a longtime faculty member and agricultural economist to create and implement an economic development plan to support rural communities across the state.

Last fall, following a nationwide search, Jay Lillywhite joined the College of ACES leadership team in a new role as an assistant dean for economic and rural development.

"There is a big need to bring more agriculture-based economic development to New Mexico," College of ACES Dean Rolando A. Flores Galarza said. "Dr. Lillywhite will lead our economic development efforts with special attention to rural communities. He will work closely with senior ACES and NMSU administrators, faculty and staff, along with university stakeholders, to collect, organize and analyze data to assist our college in making effective and positive impact management decisions."

Lillywhite, a professor of agricultural economics and agricultural business, views his new role as an extension of his responsibilities as an agricultural economist and co-director of NMSU's Center of Excellence in Sustainable Food and Agricultural Systems, or CESFAS.

"New Mexico's economic development plan identifies nine target industries, all of

which have connections to agriculture," he said. "A key area is the development of sustainable and value-added agriculture, which is central to the efforts of CESFAS."

Lillywhite continues to serve as the co-director of CESFAS along with Efrén Delgado.

Lillywhite spent the first few weeks in his new role meeting with agricultural, community and economic development stakeholders. He said establishing connections with business leaders, policymakers and others will help the college understand how it can best support community building and business and product development.

"Where can we contribute? How can we help? These are the key questions," he said. "We have some ideas. We're working on grants, contracts and proposals that, if successful, will ultimately contribute to economic development in the state."

Lillywhite said CESFAS, for example, can explore opportunities for new value-added food and fiber products and help stakeholders identify potential business opportunities through market research and feasibility studies.

"If someone has an idea for an agricultural-related business, we could help evaluate that opportunity and make sure that it

makes sense from a technical and economic standpoint," he said.

Compared to other states, New Mexico lags in certain agricultural areas such as food processing, indoor agriculture, and post-harvest, value-added agriculture, Lillywhite said. But he believes the College of ACES can help producers and farmers fill the voids and branch out into new business ventures. The goal, he said, is to spur job growth and add money to local economies.

"It's a big challenge – there's no doubt about that," he said. "But I'm excited that NMSU and ACES are drilling down and focusing on how we benefit the state. I think we can identify opportunities that will make a difference."

Lillywhite brings years of experience in farming and economics to his new role. He grew up in northern Utah and spent many years working on his grandfather's farm. He has three degrees in economics, including a Ph.D. from Purdue University, and has worked in academia since 1998. He joined NMSU in 2003.

"Agriculture runs in my blood," he said. "I love what I do. It's been a fantastic career working with students interested in agriculture and helping stakeholders around the state."

Jay Lillywhite began serving as the assistant dean for economic and rural development for the College of ACES in November 2022.



Josh Buchman

Grant to fund ag restoration project in northwest NM



Derek Floodman

NMSU's Agricultural Science Center at Farmington and the San Juan County Cooperative Extension Service Office have teamed up on a project that will aid in economic development for the agricultural sector of San Juan County and the Four Corners region.

The New Mexico Agricultural Restoration Project focuses on farmer, consumer and community education, research and training in communities negatively impacted by the 2015 Gold King Mine wastewater spill. Bonnie Hopkins, director of the San Juan County Extension Office, and Kevin Lombard, superintendent at the Agricultural Science Center at Farmington, are leading the project, funded by a \$940,000 state grant.

"The grant will fund educational positions at the San Juan County Extension Office and the Agricultural Science Center at Farmington, among other things," Hopkins said.

The project's key objectives include training for integrated and improved greenhouse and field production practices; an on-site business incubator to increase land linkages and access; diversity, equity and inclusion agricultural development training; and infrastructure enhancements for research, demonstration, community development and outreach.



‘Trees for the Future’ project aims to develop climate-adapted pecans

Researchers in the College of ACES are leading a multistate project to develop genetic tools and resources to breed climate-adapted pecan trees. The project – called “Trees for the Future” – seeks to leverage pecan genetics to breed pecan trees for climate adaptation, said the project’s director, Jennifer Randall, a professor in the Department of Entomology, Plant Pathology and Weed Science.

“Pecan has a native region that spans from Oaxaca, Mexico, to Illinois, which is an expansive geographical range with many different climates,” she said. “Our goal is to have trees that are best-suited for their regional areas and determine not just what would be great to grow in specific areas today, but 50 years from now under climate change.”

Randall received a “Center of Excellence” grant from the U.S. Department of Agriculture’s National Institute of Food and Agriculture to fund the project for next four years, starting with \$3.9 million for the first two years.

The project includes researchers from NMSU, USDA, Texas A&M University, the University of Arizona, the University of Georgia, the University of Oklahoma and the University of California’s Agriculture and Natural Resources Division.

On visit to NMSU, IICA strengthens ties to ACES



Delegates from the Inter-American Institute for Cooperation on Agriculture, or IICA, completed a three-day tour of NMSU last fall to further strengthen its relationship with the College of ACES.

The delegation included Manuel Otero, the director general of IICA, a specialized agriculture agency for the Inter-American System that supports efforts to achieve agricultural development and rural well-being in the Americas.

During the visit, Otero and other IICA representatives toured NMSU’s agricultural district and two off-campus science centers, attended research presentations by faculty and students, and met with various NMSU leaders, including Chancellor Dan Arvizu.

Otero, Arvizu and College of ACES Dean Rolando A. Flores Galarza also signed a declaration to reinforce a 2019 memorandum of understanding between NMSU and IICA. NMSU and IICA have pledged to collaborate on research initiatives related to digital agriculture, bioeconomy, carbon management, climate change and rural socio-economic development.

NMSU and IICA will host an international summit on the Las Cruces campus this fall.

‘Pipeline for Ag Leaders’ program supports minority students

BY CARLOS ANDRES LÓPEZ



From left, NMSU graduate students Briza Castro, Imelda Martinez and Naomi Lucero are part of a new program that supports animal science majors from underrepresented groups. The program established a pipeline between NMSU and the California State University, Chico, to train more minority students for competitive careers in the agricultural sciences.

research internships or other summer activities in New Mexico, including the Dairy Consortium and the U.S. Beef Academy.

“A critical component of this program involves giving students research skills that will set them up to be problem-solvers who can meet the demands of the agricultural workforce,” Hernandez Gifford said.

Briza Castro, Imelda Martinez and Naomi Lucero – all animal science graduate students at NMSU – joined the program’s first cohort last fall.

“Being in this program has been such a blessing,” said Martinez, a first-year graduate student. “I feel very fortunate to have someone like Dr. Hernandez Gifford, who has had such an impact in the field of animal science, guide me through my master’s program.”

Lucero, another first-year graduate student, said she found a much-needed support system through the program.

“When I started grad school, I was nervous about not having a strong background in agriculture, but Dr. Hernandez Gifford reassured me and encouraged me to believe in myself,” she said.

The College of ACES will train more students from underrepresented groups for competitive careers in the agricultural sciences through a new program jointly operated by the California State University, Chico.

“Pipeline for Ag Leaders” – launched last fall through a \$999,786 grant from the U.S. Department of Agriculture’s National Institute of Food and Agriculture – establishes a pipeline between NMSU and CSU-Chico for minority students pursuing degrees in animal science.

“We’re recruiting, retaining and graduating outstanding students from underrepre-

sented groups to increase their capacity to enter and enhance our nation’s food and agricultural sciences workforce,” said Jennifer Hernandez Gifford, an associate professor of animal science at NMSU and the program’s director.

Hernandez Gifford and her co-principal investigators, Sergio Soto at NMSU and Kasey DeAtley at CSU-Chico, have already recruited students into the program, which runs through 2026. Students in the program will complete their undergraduate degrees at NMSU or CSU-Chico and continue their education as graduate students at NMSU. CSU-Chico students will also visit NMSU during the summers to participate in

ACES undergraduate student Chris Gomez teamed up with ACES faculty member Ivette Guzmán on a project to understand the effects of treating different onion varieties with high-salinity water.



CHARTING THE COURSE

MARC scholar eyes path to modernizing agriculture on Native American lands

BY CARLOS ANDRES LÓPEZ

The onions growing in a greenhouse at NMSU may hold the keys to unlocking critical knowledge about varieties that could thrive in the Southwest. But for Chris Gomez, they're part of a much more personal journey to combine traditional knowledge and modern agriculture on Native American lands.

Gomez, a senior studying horticulture and general agriculture, grew up on the only federally recognized pueblo in Texas – Ysleta del Sur Pueblo in El Paso – and

came to NMSU on a mission to become the first member of his family to earn a science degree.

A long-held interest in food production guided Gomez through his time at NMSU. It's an area he believes has the potential to bring real change to Indigenous communities at home and beyond.

"Food production is a real critical thing right now in the world," he said. "Indigenous populations worldwide lack access to fresh water and food. I'm hoping to find

Josh Bachman



Gomez uses an Li-6800 photosynthesis gas exchange instrument to take photosynthetic measurements of an onion's leaves as part of a project examining photosynthetic rates of onions grown under harsh conditions. Gomez, a member of the Ysleta del Sur Pueblo in El Paso, wants to bring back large-scale agriculture production to his pueblo and other Native American communities.

solutions that will make it possible to bring back large-scale agriculture production to my pueblo and other reservations.”

Gomez believes the path to accomplish this and perhaps more begins with a research project examining photosynthetic rates of onions grown under harsh conditions.

Two years ago, the doors opened for Gomez to participate in a multiyear research training opportunity for underrepresented students through the Maximizing Access

to Research Careers program. The MARC program supports diverse undergraduate students like Gomez who aspire to complete higher degrees and become well-trained biomedical scientists.

Gomez teamed up with a faculty mentor, Ivette Guzmán, on a project to understand the effects of treating different onion varieties with high-salinity water. Guzmán, an associate professor of horticulture and co-director of the MARC program, focuses

much of her research on understanding plant physiology in response to environmental stressors like drought and high-saline water sources. Her goal is to discover innovative ways to obtain crop yields that have increased nutritional and medicinal value to enhance human health and well-being.

“We have a lot of water problems in the Southwest – lack of fresh water and an abundance of high-saline brackish water,” Guzmán said. “One of my interests is

growing plants under stress, and I thought it would be interesting to grow plants under stressful water conditions and look at their physiology to see if we can find crops that can grow under those conditions.”

For their project, Guzmán and Gomez homed in on onions, one of New Mexico’s top commodities. Gomez first developed a baseline study using about six dozen bulbing and bunching onions grown in a climate-controlled greenhouse on campus. His goal was to establish peak photosynthesis times for the onions.

He determined that the onions reached maximum photosynthesis at 10 a.m. From there, he began treating half of the onions with regular tap water and the other half with a 50-millimolar saline solution. Then, using an Li-6800 photosynthesis gas exchange instrument, he took photosynthetic measurements of each plant’s leaves, looking closely at carbon assimilation, transpiration and fluorescence.

He concluded the project this spring by conducting two experiment replications to ensure accurate results. His preliminary findings show that the ‘He Shi Ko’ bunching onions, commonly known as scallions, had the highest assimilation compared to bulbing onions and other types of bunching onions. In addition, the results indicate that this high level of salinity did not affect photosynthesis in any of the four onion varieties tested.

“His work will provide growers with critical information on what onion varieties would do best in the Southwest,” Guzmán said. “It will also provide a method to further evaluate vegetable varieties and their photosynthesis response to irrigation with saline water.”

Guzmán said the project will help inform future projects examining the effects

of water stress on vegetables and greenhouse experiments.

Gomez plans to present his results at the 2023 Undergraduate Research and Creative Activity Symposium at NMSU and the American Society of Horticultural Science conference in Florida. Guzmán said a paper on the study will also likely be published in a peer-reviewed journal, with Gomez as the lead author.

Guzmán said she saw a “big confidence boost” in Gomez as he progressed through the MARC program, which Gomez praised in turn for expanding his knowledge of the research process and preparing him for graduate school.

“Being able to participate in the MARC program has changed my life,” he said.

This fall, Gomez will begin a Ph.D. program at another university, bringing him much closer to realizing his dream of serving Native American communities through research and education. He envisions a future where he can help his pueblo establish a modern cropping system and teach farmers on Native lands how to grow crops using the latest techniques.

“Ultimately,” he said, “I want to combine community involvement, scientific research and traditional knowledge to increase food and agricultural sovereignty in marginalized communities like my pueblo.”



Gomez wrapped up the two-year research project this spring. His preliminary findings show that the ‘He Shi Ko’ bunching onions, commonly known as scallions, had the highest assimilation compared to bulbing onions and other types of bunching onions. His research will help inform future studies examining the effects of water stress on vegetables and greenhouse experiments.

A FUTURE WITHOUT FENCES?

Researchers test new livestock technologies designed to improve sustainability and lower costs

BY ADRIANA M. CHÁVEZ

NMSU's Chihuahuan Desert Rangeland Research Center is home to an innovative virtual fencing project, which involves managing livestock without the use of physical fences.





From left, Santiago Utsumi, Shelemia Nyamuryekung'e, Andrew Cox and Maximiliano Spetter at the Chihuahuan Desert Rangeland Research Center, where Utsumi is leading the virtual fencing project as part of an initiative under the Sustainable Southwest Beef Coordinated Project.

Just north of Las Cruces, on terrain that has endured harsh conditions for centuries, is what many consider to be a glimpse into the future of ranching.

The Chihuahuan Desert Rangeland Research Center is home to an innovative virtual fencing project, which involves managing livestock without the use of physical fences. Instead, livestock wear collars that emit a programmed audio tone and warn animals of receiving electric pulses if they walk over virtual boundaries, which are programmed by the collar's associated app. Those electric pulses are rare compared to the audio warnings, and the pulses are a fraction of the electric pulse animals can experience if they touch a conventional electric fence.

"Virtual fencing has the advantage of being more flexible and, on occasion, more

cost-effective than traditional physical fencing," said Santiago Utsumi, associate professor in the Department of Animal and Range Sciences. "For example, in ranches across the Southwest, virtual fencing may enable a better allocation of livestock to highly heterogeneous forages and terrains that otherwise would require large investments in fencing and other ranch infrastructure to further fragment landscapes and control grazing pressure."

The virtual fencing project is an initiative under the Sustainable Southwest Beef Coordinated Project, funded by a 2019 grant from the U.S. Department of Agriculture and the National Institute for Food and Agriculture's Sustainable Agricultural Systems program. The project began in 2020 and will continue through 2025.

The Sustainable Southwest Beef Coordinated Project consists of an interdisciplinary group led by NMSU and USDA Agricultural Research Service engineers, computer scientists, and animal and range scientists. The NMSU group includes Utsumi, Andres Perea, Sara Campa, Micah Funk, Andres Cibils, Shelemia Nyamuryekung'e, Andrew Cox and Maximiliano Spetter.

Utsumi said scientists working on the project also designed a prototype cow neck collar that can track a cow's movements with triaxial accelerometers, GPS antennas and temperature sensors. The collar also helps collect data on preferred grazing areas, the number of visits to drinking water locations, walking distances, resting behavior, changing climates, forages and rainfall. The collar uses power-efficient receiving stations to allow data-gathering from multiple collars, environmental sensors and sensors in very remote locations. Software was also developed to manage the technology's infrastructure, along with NMSU and Amazon Web Services contracted servers.

"Our testing wireless LoRaWAN network today includes semi-permanent and portable receiving stations covering more than 360 square miles of rangeland," Utsumi said. "We're using it to monitor more than 160 head of cattle in four herds, 11 stock and drinking tanks, and five rain gauges at three ranches in New Mexico."

Virtual fencing, also known as geo-fencing, is a relatively recent technique to manage livestock, Utsumi said. Today, only four companies globally sell virtual fencing collars for livestock.

"NMSU has recently contracted with two of those companies, Nofence and Vence, to initiate the testing of the technology," Utsumi said. "Both companies provide

equipment with technical characteristics that suit different needs for livestock and grazing management."

Preliminary findings involved about 28 lactating Brangus cows at the Chihuahuan Desert Rangeland Research Center. Among those cattle, collars were 98% successful in containing cattle inside allowed training areas and between 97% to 99% successful in altering grazing distribution when trained cattle were rotated on a desert pasture.

"We believe that our new digital ranching technologies can improve the sustainability of ranching and beef systems in New Mexico and the Southwest," Utsumi said. "The ability to virtually fence livestock and monitor health, drinking water, forages and rainfall in real time could improve ranch planning significantly through faster adaptation to changing climates, lower ranch-monitoring costs, and animal wellness – all while likely reducing the carbon footprint of ranching."



Utsumi's research team designed a prototype cow neck collar that can track a cow's movements with triaxial accelerometers, GPS antennas and temperature sensors through an associated app. The collar also helps collect data on preferred grazing areas, the number of visits to drinking water locations, walking distances, resting behavior, changing climates, forages and rainfall.

Digital agriculture initiatives across AES sites

Researchers at the **Corona Range and Livestock Research Center** are testing the practicality of the new Ranchbot water system monitors, which were installed at a central water storage tank. The tank monitor utilizes wireless technology to communicate to a wireless trough sensor installed on the first trough a mile away, then relays water levels and alerts via satellite communication.

The **Clayton Livestock Research Center** is home to the SmartFeed and SmartWeigh systems, which consist of high-tech feeders and weigh systems that measure feed intake and feeding behavior. The project is evaluating Criollo-crossed cattle. The ability to continually monitor body weight will increase understanding of the impacts of feeding behaviors during the finishing phase.

At the **Leyendecker Plant Sciences Center**, a new low-cost, compact Internet of Things smart irrigation system uses state-of-the-art sensors powered by solar energy to help farmers and irrigation managers collect and interpret data that can help determine the best times to irrigate crops. The system may be customized to meet the needs of different crops.

A collaboration between the **Bio2Robotics Laboratory in the College of Engineering** and the **Soil Physics Lab in the College of ACES** is delving into the use of robotic systems for chile pepper farming. A robotic arm attached to a ground-rover robot measures soil moisture and soil and leaf temperature while capturing images of crop performance. The data gathered by the robot may help determine when to irrigate to save water, reduce pesticide usage and more effectively implement soil nutrition.



Richard Heerema joined the College of ACES in 2005 as an Extension pecan specialist. Heerema conducts research to combat drought, salinity, harsh soils and other environmental stresses so New Mexico crops, like pecans, can continue to flourish.

Josh Bachman

ROOTED IN RESEARCH

Extension specialist Richard Heerema hones expertise in helping pecans prosper

BY NICOLE E. DRAKE AND TIFFANY ACOSTA

Growing up in California’s Central Valley, Richard Heerema developed an interest in horticulture as a child. He gained an affinity for the region’s almonds, grapes, peaches, pistachios and walnuts. In 2005, Heerema joined the College of ACES as an Extension pecan specialist.

“One thing that makes pecans stand out among all of the other major commercial tree fruit and nut crops grown in the Western United States today is that this is a crop that actually originates in North America,” he said. “All other major commercial tree fruit and nut crops were introduced here from the Old World.”

Heerema has spent the past 17 years at NMSU conducting research to combat drought, salinity, harsh soils and other environmental stresses so crops in New Mexico can continue to flourish.

“I hope my research and the Extension program accomplish exactly that for pecans,” he said.

He often shares his expertise and research with New Mexico residents and coordinates educational programs for the Western Pecan Growers Association’s annual conference. He also developed the Western Pecan Production Short Course, which helps pecan producers of varying experience levels.

One of Heerema’s main research topics is mineral nutrients. Deficiencies in nutrients can limit pecan trees’ performance in New Mexico because pecans aren’t able to absorb certain nutrients found in soils common throughout the southwestern U.S. He and his team have modeled the relationships between leaf tissue concentrations of these nutrients and leaf photosynthesis in pecans, which provided a better understanding of the minimum nutrient levels needed to maintain tree health.

Heerema also has studied irrigation and plant-water relations. A U.S. Department of Agriculture-funded project allowed him and his team to install a state-of-the-art pressurized irrigation system in a pecan orchard at NMSU’s Leyendecker Plant Science Research Center. Working with ACES faculty members Sam Fernald and Dave Dubois, Heerema conducted a study on deep percolation losses of irrigation water to develop better irrigation scheduling tools for pecan farmers.

Heerema also serves as a co-principal investigator in another USDA-funded project, “Trees for the Future.” ACES faculty member Jennifer Randall serves as the project’s director. In this project, researchers are working to better understand how pecan varieties differ in their water-use efficiency and susceptibility to physiological water stress. The project’s results may provide pecan farmers with new and better options when the water supply is low (See Page 8 for more details on this project).

Heerema’s current projects revolve around the microbiome of pecan roots and rhizospheres. Since pecan roots lack root hairs that help mine soil for nutrients and water, populations of fungal and bacterial species on and around the roots may play critical roles in efficient root function.

Heerema and Randall are also part of a group of researchers analyzing how pecan root and rhizosphere microbiome diversity varies with soil characteristics in New Mexico. The team includes ACES faculty members Nicole Pietrasiak and Ciro Velasco-Cruz, graduate students McKenzie Stock and Paul Gabriel, and undergraduate student Lily Chavez. In this project funded by the New Mexico Department of Agriculture, the researchers are studying how farmers can utilize certain soil treatments to modify the pecan root and rhizosphere microbiome to increase tree health and performance.



Heerema often shares his expertise and research with New Mexico residents and coordinates educational programs for the Western Pecan Growers Association’s annual conference.

TREASURED TEACHER

NMSU's first Spanish-speaking Extension agent, Fabiola Cabeza de Baca, enriched lives across New Mexico and beyond through education and outreach

BY CARLOS ANDRES LÓPEZ



Fabiola Cabeza de Baca Gilbert in Kitchen, New Mexico. Courtesy of the Palace of the Governors Photo Archives (NNHMDC), 148467

In an undated black-and-white photograph, Fabiola Cabeza de Baca stands poised in a kitchen, looking down over a table draped in gingham cloth. She wears a patterned dress, an embroidered apron, a pearl necklace, and a pair of cat-eye glasses. Her hair is pulled back, her lips are pursed, and her gaze is fixed. She holds a knife in one hand and appears deep in concentration, working gracefully with the food before her.

It is one of many historical images that captured Cabeza de Baca's storied legacy as one of New Mexico's foremost educators and cultural authorities of the 20th century.

Over a decades-long career, Cabeza de Baca brought life-changing educational opportunities to rural and pueblo communities across New Mexico as the first Spanish-speaking agent to serve in NMSU's Cooperative Extension Service. She broke barriers as a published author, becoming a trusted chronicler of the state's heritage and cuisines through a trove of books, stories and recipes. She followed a calling in teaching and shared her expertise widely, touching the lives of countless souls over a life that began when New Mexico was still a territory.

"She lived an extraordinary life," said Elizabeth Eastman, one of Cabeza de Baca's great-nieces, "and worked tirelessly to find ways to improve the quality of life for all those she taught."

Born in 1894, Cabeza de Baca grew up on a family ranch in La Liendre, New Mexico, near Las Vegas in San Miguel County.

Fabiola Cabeza de Baca was the first-Spanish speaking agent to serve in NMSU's Cooperative Extension Service. She brought life-changing educational opportunities to rural and pueblo communities across much of New Mexico.

Born in 1894, Cabeza de Baca grew up on a family ranch in La Liendre, New Mexico, near Las Vegas in San Miguel County.

Courtesy

She completed her early education at the Loretto Academy and later attended New Mexico Normal School, where she obtained a teaching certificate.

In 1916, she found work teaching in a one-room school in Guadalupe County. Since many children in her class spoke only Spanish, she developed her own bilingual teaching reader and encouraged her students to teach one another their traditional songs, stories and customs. She taught at the school for 11 years, during which time she also completed a bachelor's degree in education at New Mexico Highlands University.

By 1927, she enrolled at New Mexico College of Agriculture and Mechanical Arts – now NMSU – to pursue a second bachelor's degree in home economics. While attending NMSU, she taught Spanish classes. One of her students was W.L. Elser, a former director of the Cooperative Extension Service, who approached her about working for the university's outreach arm.

Cabeza de Baca's life took a new direction when she began her career with Extension in 1929 – the same year she married Carlos Gilbert. Tasked with reaching Hispanic and Native American women, she worked primarily in Santa Fe and Rio Arriba counties. As the first agent assigned to pueblo communities, she learned to speak Tewa and, possibly, Towa to better communicate with the people of Nambé, Pojoaque, San Ildefonso, Ohkay Owingeh, Santa Clara, Tesuque and Jemez pueblos.

“Not only was she able to reach Spanish-speaking audiences, but she also reached Indigenous audiences in their own language,” said Karim Martinez, an Extension family life and child development specialist at NMSU.

Amid the Great Depression, Cabeza de Baca traveled across her districts to



Courtesy

Cabeza de Baca, center, started her first job as a teacher in 1916 after earning a teaching certificate from New Mexico Normal School. She taught in a one-room school in Guadalupe County, above, for 11 years before enrolling at NMSU in 1927 to pursue a bachelor's degree in home economics.

teach rural residents skills in food preservation, gardening, poultry-raising, sewing and home repair. At the time, safely preserving meat by canning was an essential technique for families to learn since vast numbers of livestock were being slaughtered as part of a government program to prevent overgrazing. For her part, Cabeza de Baca helped many families preserve meat and fresh foods using safe canning techniques.

Despite losing a leg in a train collision, Cabeza de Baca continued to traverse New Mexico, bringing Extension education to

residents across the state. She paid a driver with her own money to transport her to her districts. In 1947, she became the district Extension agent-at-large for six counties, covering a sprawling region of rural northern New Mexico from Dulce to Vaughn. She often encouraged residents living in communities without running water, paved roads, electricity or telephones to mobilize for more public services.

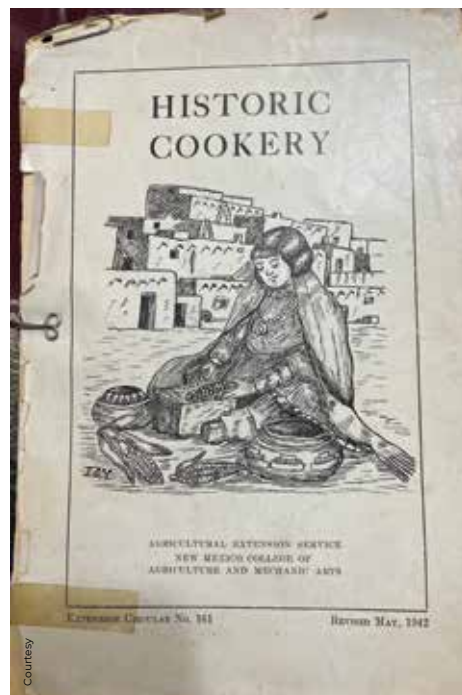
“She was ahead of her time,” said Carol Branch, one of Cabeza de Baca's great-nieces. “Women weren't doing what she was doing at that time.”

Cabeza de Baca is perhaps best known for popularizing New Mexican food. She published her first recipes in the early 1930s and gained attention for writing about fried U-shaped tacos and cooking with chile. Her first collection of recipes, *Historic Cookery*, is widely considered the earliest cookbook about New Mexican food. She published a second book, *Good Life: New Mexico Traditions and Food*, in 1949, followed by a memoir, *We Fed Them Cactus*, in 1954.

In addition to food, she also wrote extensively about traditions, folklore, herbal remedies, religious rituals and



Left: Cabeza de Baca, right, stands with an unidentified woman. Center: Cabeza de Baca published *Historic Cookery*, the earliest cookbook about New Mexican food, during the early 1930s. Right: Cabeza de Baca published two more books later in life and wrote extensively for newspapers.



farming practices of Indigenous, Spanish, Mexican and Anglo families in northern New Mexico. For many years, she penned a regular column in *El Nuevo Mexicano*, a Spanish newspaper in Santa Fe, contributed feature stories to the *Santa Fe New Mexican* and hosted weekly programs on community radio.

Spencer Herrera, a professor of Spanish at NMSU, called Cabeza de Baca a prominent figure in New Mexico's rich literary heritage.

"New Mexico does not have one of the biggest populations in the United States, but it has one of the strongest, if not the strongest, literary traditions among Hispano writers, going back to

the colonization period," Herrera said. "And Fabiola Cabeza de Baca is part of that tradition."

Herrera said he considers *We Fed Them Cactus* the pinnacle of Cabeza de Baca's writing.

"It stands out because she's a woman who's publishing – not just writing, but publishing – in 1954," he said. "It was much harder for women to publish and hard enough for people who spoke Spanish to publish. It's a remarkable feat, and it's a good book. She connects the oral history from previous generations and shares that knowledge."

In 1950, Cabeza de Baca joined a United Nations mission to Mexico, taking her teaching skills across the southern border. In villages across the state of Micho-

acán, she set up 18 demonstration centers to teach household skills to women.

"For the United Nations to recognize her expertise and send her to the Michoacán area to teach new skills to the Purépechan people, I think, is a testament to her strengths as an educator," Herrera said.

Cabeza de Baca continued to work in education and community building throughout her retirement and even trained a generation of Peace Corps volunteers who shared her influence across the world. She died on Oct. 14, 1991, in Albuquerque at the age of 97, leaving behind a legacy marked by a deep love of New Mexico and a desire to improve the lives of those around her.

"Fabiola Cabeza de Baca was a pioneering Extension leader who helped set the foundation for agents who followed her," said Jon Boren, the current director of NMSU's Cooperative Extension Service. "She is a role model to be emulated as she understood that you must be willing to grow and adapt to serve the people of New Mexico."

More than three decades after her death, she remains a source of inspiration for many.

"I think having a role model like my great-aunt showed me what was possible to achieve through education," said Eastman, a retired educator who taught at universities in California and Illinois. "She started a tradition of women in our family going to college. I was the first person in my family to complete a four-year degree, and I subsequently earned a Ph.D. in political science."

Branch, who graduated from NMSU and became an educator, grew up idolizing Cabeza de Baca, one of her grandmother's sisters. She said she now lives her life much like her great-aunt.

"She was a strong woman and very independent. I know I get my strength from her," Branch said. "Her perseverance, elegance and wisdom inspire me every day."

NMSU's Innovative Media, Research and Extension contributed research to this story.

Cabeza de Baca, center, receives an award from Gerald Thomas, left, and Leon S. Pope in this undated photograph. Cabeza de Baca continued to work in education and community building throughout her retirement and even trained a generation of Peace Corps volunteers. She died on Oct. 14, 1991, at the age of 97.



CHAMPION FOR ALL

ESSAY BY KARIM A. MARTINEZ

Conversations about equity, inclusion and diversity may seem new but have actually been occurring throughout time. All we need to do is look more closely into our history, and we will find stories of past equity, inclusion and diversity champions. While it is important to celebrate their work, it is even more essential to carry on their legacy.

In the College of ACES, I found a champion and role model in Fabiola Cabeza de Baca. I first read her name as a new Extension agent in 2004 when I received requests for copies of her Extension publication, *Historic Cookery*. People called and shared fond memories of their mothers and grandmothers using recipes from her book.

However, it wasn't until 2016 that I learned the details of her amazing life and work. As a diversity committee member in the National Extension Association of Family and Consumer Sciences, I had the opportunity to write a newsletter article – and I remembered her name.

Through researching her work, I discovered that in 1929, she was our first Spanish-speaking Extension agent in New Mexico and was recruited specifically to reach Hispanic and Native American women. As



Fabiola Cabeza de Baca was specifically recruited to serve in NMSU's Cooperative Extensive Service in 1929 to reach Hispanic and Native American women.



Top: Cabeza de Baca's first teaching job was in a rural community at a school with limited resources. Bottom: Cabeza de Baca, left, with her two sisters, Guadalupe and Virginia, in the early 1900s.

someone who also strives to reach minoritized and underserved audiences, I felt an immediate connection to her story. She taught rural women gardening, food preservation, poultry-raising, sewing and home repair. Her ethnicity allowed her to respectfully blend traditional ways with new information.



Cabeza de Baca taught rural women gardening, food preservation, poultry-raising, sewing and home repair. Her ethnicity allowed her to respectfully blend traditional ways with new information.

As she visited homes throughout rural New Mexico, she took detailed notes of village traditions. She incorporated these notes into her various books celebrating the cultures of New Mexico.

In her book, *We Fed them Cactus*, she describes her first teaching job in 1916. It was a rural community with limited resources. She used an oil-cloth blackboard, had outdated books, no bathroom and no running water. Because she had Spanish-speaking students, she created her own bilingual reader.

“We had bilingual readers for the primary grades. In this way, the English-speaking children learned Spanish and the Spanish-speaking learned English,” she wrote. “It is amazing how well both groups learned each other's language in just seven months of school.”

I was inspired as I read about her multicultural approach to teaching. She had children from Indigenous, Mexican, Spanish and Anglo backgrounds, and when she taught music, she had the students teach each other their traditional songs so that everyone learned from each other.

Her writings show she cared deeply about the people she served and learned a great deal from them.

“I am sure that I underwent one of the best educations anyone could receive. I learned the customs, food habits, religions, languages, and folkways of different national groups. They were all simple, wholesome people living from the soil,” she wrote. “They certainly were a hardy lot, for otherwise they would not have survived the cruelty of the wind, the droughts and the poverty which surrounded most of them. They asked my advice on many subjects, but I never felt capable of giving it to them. My education was from books; theirs came the hard way. It was superior to mine.”

Learning about Fabiola Cabeza de Baca has inspired me to continue my work serving the diverse people of New Mexico. I encourage others to learn more about her and other equity, inclusion and diversity champions. By celebrating their work, we gain inspiration and can strive to build on their legacy.

Karim A. Martinez, an alumna of NMSU, has worked for NMSU's Cooperative Extension Service since 2004. She is currently a family life and child development specialist and an associate professor in the Department of Extension Family and Consumer Sciences.

AN EQUINE EDUCATION

Equestrian team captain pursues passion to work with horses

BY TATIANA FAVELA

One student in the College of ACES is pursuing her childhood passions, saddling up and riding toward her future – all thanks to NMSU’s equestrian team.

Montserrat Martinez Najera came to NMSU in 2021 to pursue an academic opportunity that involved horses.

“Since I was a little kid, I always liked horses,” said Martinez Najera, an animal science student, who will graduate this spring. “I started riding horses in Mexico when I was 7 years old. I was a barrel racer, and I also did *escaramuza charra*, which is a tradition in Mexico where you wear big dresses and big hats, and you show up with a horse and perform a routine. I always knew that I liked horses and that I wanted

to work with them and become a vet, which is why I came to New Mexico State.”

Martinez Najera joined the equestrian team during her first semester at NMSU after meeting the team’s coach, Hannah Bilovesky. Martinez Najera also joined the NMSU Horseman’s Association, a student club in which members participate in equine-related activities and events throughout campus and the community.

“The equestrian team was a big team about 10 years ago, and even Hannah was part of it,” Martinez Najera said. “Unfortunately, in 2017, the program was shut down, and they had to stop. Hannah had decided to start it again, and she’s the one who really fought for it. She sent out an email saying that the equestrian team was



Montserrat Martinez Najera, an animal science student who will graduate this spring, joined the NMSU equestrian team in 2021. She served as the team’s captain for the 2022-2023 season.



Josh Bachman

Outside the equestrian team, Martinez Najera served as the president of the NMSU Horseman's Association, a student club in which members organize equine-related activities and events.

coming back and invited everyone to join – and I thought, ‘Why not?’”

Although Martinez Najera was new to competitive horsemanship, she quickly learned the ropes. She spent much of her first year on the team developing her skills to become a stronger competitor. She ended her first season as the team’s “most improved rider.”

“Montserrat has grown a lot as a rider with our team,” Bilovesky said. “She had never ridden this type of event, horsemanship, but has been very willing to learn

and worked very hard. She has been a very coachable rider and is always willing to work hard and keep progressing. She maintains a positive attitude even when she is pushed during practices.”

In 2022, the team picked Martinez Najera to serve as its captain, a role that allows her to continuously support her team members. She also served as the president of the Horseman’s Association.

“I think the hardest thing about being a team captain is that different people react

differently to situations,” she said. “I always try to check up on my teammates because I know a lot of different students have a lot of different problems – so I get it. If things get too difficult, I always turn to Hannah for advice.”

Martinez Najera is quick to point out the importance of building friendships and receiving support from family.

“It’s not easy to do all of it by yourself. If your family doesn’t have a background in horses or animals, it’s still OK because my family doesn’t have that background,” she said. “I am fortunate that my mom has gone to two of my competitions, and it’s nice that she’s been there since Day One. It’s especially nice to see other families support my team members.”

Bilovesky said Martinez Najera is one student who exemplifies the benefits of being on the equestrian team.

“The equestrian team here at NMSU allows students like Montserrat the opportunity to expand their skill set outside the classroom, compete and represent their university, and build a network of peers within the equine community that they can draw on after they finish their degree,” Bilovesky said.

HOW TO HELP

The NMSU equestrian team relies on support from community members. To help, call **575-646-2929** or email **hswarth@nmsu.edu**.

For more information about the team, visit **nmsu.link/equestrian-team**



Courtesy

Blue corn seedlings grown on the Isleta Pueblo as part of an ongoing collaboration between the Southwest Grain Collaborative and NMSU’s Semi-arid Cropping Systems Research Innovation Program.

A NEW WAVE OF GRAIN

NMSU collaboration supports renewed interest in heirloom wheat and corn crops

BY AMANDA BRADFORD

Across the nation and here in New Mexico, there's a growing demand for locally sourced foods and other agricultural products. A research and outreach partnership between New Mexico State University's Department of Plant and Environmental Sciences and the non-profit Southwest Grain Collaborative is working to help local grain producers capitalize on that demand and build a robust farm-to-table pipeline in New Mexico and the Southwest.

The partnership leverages expertise in NMSU's Semi-arid Cropping Systems

Research Innovation Program, part of the College of ACES.

"One of the leading poster crops for that growing demand for locally produced and sustainably produced food was the heirloom tomato showing up in farmers markets and piquing the interest and demand of consumers," said Richard Pratt, professor of plant and environmental sciences at NMSU and director of the Cropping Systems Research Program.

"We've seen that growth all along the market chain. There has to be that connect-

edness between the growing demand and the supply," Pratt continued. "And when people like restaurant owners look around and they can't find enough blue corn, or they can't find enough heirloom wheat, that's demand that's going unmet. So that initial demand and awareness around locally grown vegetable crops and the exposure at farmers markets has really expanded into the whole-food chain and demand has increased."

If local agricultural producers can grow more high-value crops like heirloom grain varieties, it creates economic opportunity

in a market where the demand is there, but product is scarce, Pratt said.

The Southwest Grain Collaborative project began about six years ago in answer to that growing demand.

"I just happened to be reading the New York Times one morning, with my coffee, as I often do, and there was a story about a new company that was looking to source heirloom corn – corn that's been raised by farmers and selected by farmers for generations," said Timothy Vos, an agroecologist and one of the collaborative's founding members. "They were looking for that corn in Mexico, in Oaxaca and other areas, and sourcing it there and importing it across the border and supplying the upscale restaurants of New York City and Chicago and San Francisco."

At that time, Vos was a contractor with NMSU's Cooperative Extension Service working with producers in some of New Mexico's Native communities, and he saw an opportunity: If research and resources could help farmers scale up their production and marketing, they'd have a guaranteed market for their grain products – and at a premium price.

But shifting to this type of heirloom variety crop, using sustainable farming practices like cover-cropping, isn't an overnight transition for any farmer – and any such transition can be risky. It's a learning curve for many producers, and they need to be confident that the change will be worth it. That's where NMSU's research knowledge and SGC's funding network combine to mitigate risk and help farmers achieve success.

In partnership with Southwest Grain Collaborative, NMSU's agricultural researchers are producing new research in cropping systems and soil management to



In partnership with the Southwest Grain Collaborative, NMSU's agricultural researchers are producing new research in cropping systems and soil management to support better yield and production for crops like Sonoran white wheat, blue corn and heirloom bean varieties.

support better yield and production for crops like Sonoran white wheat, blue corn and heirloom bean varieties that have deep roots in New Mexico's agricultural history. At the same time, SGC uses funding from federal grants and private foundations to provide heritage grain and cover-crop seeds, soil testing and other resources to help encourage regenerative practices. It's a whole-farm approach that includes every step from planting seeds to marketing and distributing the products, and it's already yielding results for New Mexico farmers who are seeing their locally grown products touted by chefs on the menus of restaurants like Los Poblanos in Albuquerque.

Vos and Pratt see the potential for these heritage grains to become an increasingly important part of New Mexico's agricultural economy, because of the growing interest consumers have in knowing where their food comes from.

"People want to know more about the farming practices that are producing the products that they're consuming," Vos said. "I think, also, that there's a desire to reconnect culturally and with our food traditions. That's why the farmers market thing is such a cultural happening. Not just for the food, but to be connected to the farmer and have a sense of who the farmer is and a sense that they're supporting that agricultural world."



A clipper grain cleaner with totes of Sonoran white wheat milled on a farm that works with the Southwest Grain Collaborative. SGC is working with NMSU's Semi-arid Cropping Systems Research Innovation Program to help local grain producers capitalize on demand for locally sourced foods and build a robust farm-to-table pipeline in New Mexico and the Southwest.

4-H FOREVER



4-H'ers re-create the iconic 4-H four-leaf clover during the 1961 State 4-H Conference at NMSU.

NMSU photo

As milestone state conference nears, 4-H alumni share how youth program shaped their lives

BY JAMES STALEY

An air of permanence emanates from almost anything that has endured for a century – it was always here, right? The NMSU 4-H program, which will hold its 100th state conference this summer on the Las Cruces campus, certainly qualifies for that distinction. 4-H was, however, new once. Yes, really.

The roots of 4-H stretch back to the agricultural trains chugging along the Santa Fe Railway in 1912, across this vast region, then a sparsely populated area just beginning its statehood. As part of those educational tours, officials held special meetings for youths, which ultimately evolved into the 4-H program, the flagship youth development program of NMSU's Cooperative Extension Service.

But the permanence of 4-H goes beyond the organization's longevity and growth – there are now about 30,000 youths who benefit from the 4-H program each year, guided by nearly 3,000 volunteers and 4-H Extension faculty in all 33 New Mexico counties. It also goes deeper than 4-H's mission in providing opportunities for young people to develop leadership and management skills, positive self-esteem, effective communication skills, a solid sense of personal responsibility and the ability to make sound decisions.



NMSU photo

In this undated photograph, a pair of 4-H students smile and dance during a State 4-H Conference. This summer, NMSU will host the 100th conference on the Las Cruces campus.



Left: John Hanlon was elected vice president of the State 4-H Council during the 1986 State 4-H Conference. Top: Jason Cantrell, left, and Andy Ricketson participate in a braiding workshop. Bottom: Jody Montgomery, left, participates in television workshop taught by Sheri Lygber at KRWG on the NMSU Las Cruces campus.

4-H carries that forever feeling because its lessons and experiences become engrained within its alumni, shaping the rest of their lives in many ways.

“When I think about all that I learned through 4-H, responsibility, goal-setting and teamwork are obvious answers, but there’s so much more,” 4-H alumna Danette McGuire said. “A lifelong interest in learning, a will-

ingness to try new things and resilience to try again if you aren’t successful in the first, second or sometimes the 10th attempt – but after the 10th attempt, I do have a great gluten-free biscuit recipe.”

McGuire was so influenced by her time in the 4-H program, and the coaches, mentors and advisers who volunteered to help her and scores of other kids, that she



As a 4-H'er, Barbara Chamberlin found a love of public speaking that led to a career in educational media design. Chamberlin now leads the NMSU Learning Games Lab.

carried that spirit into her own career. For the past 10 years, McGuire has been the executive director of the American Youth Horse Council, where she gives back to 4-H and other youth programs.

“Problem-solving and decision-making are two skills that I find remarkably important, and I can easily point to events like consumer decision-making, horse judging and team-building activities that helped develop those skills,” McGuire said. “I don’t remember the exact scenario, but someone once asked me, ‘How do you know how to do all these things?’ My response: I was in 4-H!”

Enthusiasm for 4-H – and similar stories from alumni – is almost as easy to find as the organization’s ubiquitous green clover.

Barbara Chamberlin has that energy, too. As the assistant department head for NMSU’s Innovative Media, Research and Extension, Chamberlin leads the Learning Games Lab.

As a 4-H'er, Chamberlin said she raised pigs, rode horses and baked. She also found her love of public speaking, which initially led her into standup comedy, then to educational media design, a subject in which she has a Ph.D. (“Worth leaving comedy for!” she said.)

“My experiences in 4-H shaped how I believe people learn,” Chamberlin said. “When I want to change a person, I know that we can’t simply tell them information and expect them to change, but we can find ways for a person to engage in meaningful ways, learn from social interactions, and reflect on what they’ve learned.”

She continued: “John Dewey said it best, ‘We do not learn from experience ... we learn from reflecting on experience.’”

That sentiment is best expressed through the 4-H motto, “learn by doing,” which ties together generations of alumni. A report in the *Round Up* about the 4-H State Conference in 1928 mentioned attendees traveling to El

Paso to inspect industrial plants. As the years progressed, recaps of the conference grew, but the involvement remained the same.

Derek Dictson is a 4-H alumna immersed in the organization’s history. Both his father and grandfather worked in the Cooperative Extension Service and 4-H.

“I chose NMSU for college because I had spent a week every summer in Garcia Hall and Corbett Center for the State 4-H Conference and was very comfortable on campus,” said Dictson, who grew up in Clovis and attended Texico High School (graduating class size: 28). He’s now president of the NMSU Foundation.

Dictson said he learned to be a better communicator and leader through 4-H.

“I owe a lot to 4-H and would not be the person I am today without having had those experiences,” he added.

Amid the current 4-H'ers at this year’s state conference, McGuire is planning to organize a reunion for 4-H alumni.

“I can’t wait to hear about what they’re doing now and how 4-H influenced their lives,” she said. “I fully expect there to be lots of laughter, chatter, hugs, cheers and shared memories.”

2023 STATE 4-H CONFERENCE

What: Hundreds of qualifying 4-H teens will descend upon NMSU for contests, workshops, evening sessions, an awards ceremony, and to elect a new leadership team.

When: July 10-14 on NMSU’s Las Cruces campus

More info: Visit nm4h.nmsu.edu/4h/conference.html for schedules, rules and other information. Connect with other alumni on the private Facebook group. Search “NM State 4-H Leadership Team Alumni” and click the group button to request access.



Neil Burcham, who died in December at the age of 81, was an associate professor of animal science in the Department of Animal and Range Sciences for 48 years. He was also a renowned expert in livestock production and livestock judging in the United States and abroad.

A LEGACY THAT LIVES ON

ACES alums share fond memories of Neil Burcham

BY TATIANA FAVELA

In nearly five decades of teaching at NMSU, retired animal science professor Neil Burcham touched the lives of hundreds of students and colleagues and left a lasting impact on the livestock industry in New Mexico and across the United States.

Burcham, who died in December 2022 at the age of 81, was an associate professor in the Department of Animal and Range Sciences for 48 years before retiring in 2017. He was also a renowned expert in livestock production and livestock

judging, not only in the United States but also internationally.

Many who knew Burcham described him as one of the most influential professors in the College of ACES.

“Neil Burcham was known for his helpful and caring relationship with students,” College of ACES Dean Rolando A. Flores Galarza said. “Neil responded to students who were serious about their education, and students knew they could count on him for his guidance.”



Many consider Burcham one of the most influential professors in the College of ACES.

Former students like Dan Delaney, an NMSU alumnus who graduated in 1978, appreciated Burcham’s mentorship and friendship.

“As a friend, there was no better. No matter the problem – he always had your back,” Delaney said. “As a professor, there was no brighter mind in the livestock industry, and he imparted that wisdom freely.”

Christopher Allison, another former student and current program operations director for the College of ACES, recalled Burcham had a gift for remembering students’ names, hometowns and their life stories.

“After 40-plus years, he could still recall the most detailed description of his students. I have never seen anything like it,” Allison said. “My experience with him showed me that he was a very caring man. When my youngest daughter, Ashley, was born with Down syndrome, Neil sought me out to share his experiences with his granddaughter, Courtney, who also shared the same trisomy issue. I would call on Neil repeatedly for advice in this regard.”

Marcie Wallin was part of Burcham’s livestock judging team as a student. After leaving NMSU, she stayed connected to Burcham to seek advice and catch up with him on life milestones.

“Not only did Mr. Burcham help his students while in school, but after as well,” Wallin said. “He tried to get me to accept a job offer after graduation, and I declined because I wanted to return home and live happily ever after. I went back to college 20 years after NMSU and got a Bachelor of Science in nursing. I sent him an announcement, and in return, I received a note written in pencil: ‘Congratulations! I always knew you would make it. If you need any letters of recommendation, let me know!’ I keep his letter with my résumés to this day.”

After retiring, Burcham continued to impact the lives of many students and the cattle industry.

“Cattle producers, feeders and processors constantly sought his opinion,” Allison said. “Neil was never bashful about telling industry professionals about a student they should hire. He was undoubtedly the best job placement person on campus. Untold numbers of students owe him their career starts.”

Burcham continued to receive academic and industry awards after his retirement.

Last year, he was inducted into the Northeastern Oklahoma Junior College Hall of Fame. This spring, he was posthumously inducted into the American Brahman Breeders Association Hall of Fame, and a classroom was named in his honor at the new Food Science Learning and Safety Center on NMSU’s Las Cruces campus.

“Neil displayed a keen wit in his professional life and was deeply appreciated by his students,” Flores Galarza said. “He will be sorely missed.”



Burcham was well-known among cattle producers, feeders and processors in the livestock industry across the U.S. He received many academic and industry awards after his retirement.

Alana Jacobson

Entomologist works to keep invasive crop pests under control

BY CARLOS ANDRES LÓPEZ

Each year, invasive pests and plant diseases destroy 20% to 40% of world crop production, costing the global economy about \$290 billion, according to the Food and Agriculture Organization of the United Nations. So, it's up to entomologists like Alana Jacobson to keep crop pests at bay.

Jacobson, a College of ACES alumna and associate professor of entomology at Auburn University, has spent the past decade investigating pest management problems at local, regional, national and international scales, while working to find solutions for issues related to sustainable agricultural production and feeding the growing population.

Jacobson, who hails from Phoenix, developed an interest in studying insects while in a high school magnet program for agricultural sciences. That interest ultimately brought her to NMSU, where she earned a bachelor's degree in agricultural biology from the Department of Entomology, Plant Pathology and Weed Science in 2004.

"I like working on problems associated with insects that transmit viruses because they're so complex," she said. "There are so many different interactions with insects and plants that it's a unique and challenging area to work on."

Jacobson later completed a master's degree in entomology at Purdue University and earned a Ph.D. in entomology from North Carolina State University.

In 2014, she joined Auburn University as an assistant professor in the College of Agriculture, where she teaches and oversees a research lab. Much of her current research focuses on better understanding vector-virus interactions responsible for transmitting plant pathogens.

"NMSU was a good place for me at the time and gave me a good foundation in the agricultural sciences," she said. "The interdisciplinary nature of the Department of Entomology, Plant Pathology and Weed Science allowed me to learn about all aspects of pest management – not just one area. Being in that department gave me a well-rounded background that prepared me to move forward in whatever direction I wanted to."

Jacobson said she has many fond memories of NMSU and New Mexico, where she built lasting friendships as an undergraduate student. Even now, many years later, she makes sure to catch up with former NMSU classmates and professors at academic conferences.

"There's still a cohort of friends that I keep in touch with to this day," she said. "I don't think you can mention living in



Alana Jacobson, who graduated from NMSU in 2004 with a bachelor's degree in agricultural biology, is now an associate professor of entomology at Auburn University.

New Mexico without the food and Hatch green chile. I miss New Mexican food to this day."

Diana O'Brien

Community leader lifts lives through compassion and kindness

BY TATIANA FAVELA

Two-time College of ACES alumna Diana O'Brien has followed a passion for serving and empowering her community since graduating from NMSU.

In 2010, O'Brien received a bachelor's degree in family and child science with a minor in counseling and educational psychology. Two years later, she earned a master's degree in marriage and family therapy.

"My professors, mentors and the department staff within ACES went above and beyond to encourage me along my journey, and I was able to learn from experts within my field," she said. "My experiences in my collegiate career have helped to shape who I am as a person, both personally and professionally."

O'Brien now serves as the director of impact and outreach for the Community Foundation of Southern New Mexico.

"My personal mission and efforts align with the foundation's vision of working to ensure that the community is connected to the resources it needs to thrive," she said. "I strive to foster collaboration and create access to resources and opportunities that positively impact southern New Mexico through CFSNM and its multifaceted efforts to build and strengthen communities."

O'Brien, a licensed marriage and family therapist, has worked with children, families,

couples and individuals in diverse settings. She is also an adjunct faculty member in NMSU's College of Health, Education and Social Transformation, a co-lead ambassador for the Doña Ana County Early Childhood Education Coalition, a behavioral health co-sector leader of Doña Ana County Resilience Leaders and a member of LC3 Behavioral Health Collaborative. She also serves as a board member for the New Mexico Association for Infant Mental Health and Tierra Del Sol Housing Corporation.

Throughout her career, O'Brien has worked to help communities move forward across multiple sectors, including early childhood education, behavioral health, nonprofit and higher education.

"I am also the founder of the Random Acts of Kindtrip, which since 2015 has fostered community and connection through acts of kindness and compassion and whose impact spans 39 states within the United States and has extended into British Columbia," she said.

O'Brien said her work centers on program development and delivery of services and interventions that create systemic and generational change from a strengths-based approach.

"I believe in working to create spaces where people feel seen, heard and valued," she said. "My passion lies in fostering a supportive community where people feel



Diana O'Brien, who earned two degrees from NMSU, now serves as the director of impact and outreach for the Community Foundation of Southern New Mexico.

empowered and are provided access to resources and opportunities. I am a proud New Mexican, and I am passionate about serving my community."

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