

AGRICULTURAL SCIENCE CENTER AT FARMINGTON

Strategic Plan 2020-2025

MISSION

The mission of the NMSU-ASC-Farmington is to conduct research, demonstration, and educational programs that will best fill the needs of the Agricultural community of San Juan County and the Navajo Nation in particular, and the State of New Mexico, Four Corners Region, and Nation in general.

The New Mexico State University Agricultural Science Center at Farmington (ASC-Farmington) is located on land leased from the Navajo Nation and has provided technical support and training to Navajo farmers. The location on Navajo Agricultural Products Industry lands and close proximity to traditional Navajo and non-Navajo irrigated farmlands give the ASC-Farmington a unique opportunity to positively influence operations on one of the largest farms in the country, as well as serve smaller irrigated farmers in the valley. The ASC-Farmington's location near Farmington, NM, gives access to a large urban horticulture clientele.

OPPORTUNITIES

- Trends for new cropping systems, certified organic, permaculture, specialty crops, and food system approaches to community health.
- The Four Corners region is highly underserved. Opportunities for collaborating with all the regional institutions of higher learning for research, government, and individuals for teaching and outreach. External funding is somewhat less competitive given the underserved area. A graduate student pool is there (mainly from Fort Lewis College, Durango Colorado) and newer housing is available to host graduate students.
- A unique feature of the ASC-Farmington is the diversified irrigation infrastructure that includes rectangular fields under solid set sprinklers, drip irrigation, and six center pivots. Upgrades to the six center pivots (some were >30 years old and a safety hazard) began in 2018 and are nearing completion through donations of time and equipment from ASC-Farmington partners at the Navajo Agricultural Products Industry (NAPI) and Navajo Mesa Farms (NMF). *Navajo Agricultural Products Industry is a \$51 million operation of more than 600 center pivots.* Pivot leases include NMF for high quality/value potato, Anderson Hay (alfalfa), and to a lesser extent Pumpkin Patch (Halloween pumpkins) and a popcorn facility. NAPI leases a flour mill adjacent to the ASC-Farmington. Several thousand acres of irrigated land are farmed in the San Juan, Animas, and La Plata River Valleys. Farmington, Aztec, Bloomfield, Kirtland, Shiprock, neighboring Colorado (Cortez and Durango) form a linked agricultural, tourism, and extractive (oil, gas, coal) economy.
- With the decline of extractive industries and the imminent retirement of a generation of farmers nation-wide including the San Juan Basin, the ASC-Farmington, with its partners, is positioned to become a research and training leader for new and beginning farmers in high desert irrigated agriculture, with the added value of being located *on* the Navajo Nation. ASC-Farmington is also situated near urban and peri-urban environments and contributes to this clientele, especially in horticulture and water conservation.

STRATEGIC PRIORITIES

- Agronomic and specialty crops for adaptability and value-added regarding water management, soil quality, weed management, including such emerging efforts as certified organic transitions.
- Health and food transect to address underlying health conditions and food deserts on the Navajo Nation, involving small-scale farming/gardens.

GOAL 1: ENHANCE STUDENT SUCCESS AND SOCIAL MOBILITY

Student success engages and extends NMSU's teaching mission in undergraduate and graduate, K-12, professional workforce development, and community learning across a broad range of agricultural, health, environmental topics in the region surrounding the ASC-Farmington.

Objective 1.1: Maintain and enhance the existing structure that supports student success.

Actions:

- Promote ASC-Farmington as a learning destination for cropping systems and specialty crop evaluations, environmental monitoring, water management techniques, and technologies, and addressing health disparities in a geographically and culturally unique region.
- Provide indoor spaces with technical supports for formal classrooms, live video, hybrid, and distance learning for all types of learners.
- Promote opportunities for STEM education with K-12 students.

Objective 1.2: Increase recruitment and retention of undergraduate and graduate students in programs of the College of ACES.

Actions:

- Accommodate (with housing/office/lab/field plots) research programs that support student learning.
- Represent NMSU and ACES at recruitment and transfer fairs across area high schools and colleges.
- Promote ASC-Farmington's high-speed internet/telecommunications to facilitate a satellite campus for live video, hybrid, and traditional in-class proctoring across ACES and NMSU main campus classrooms (e.g., Master's in Public Health) to recruit and retain NMSU students, especially to underserved/disadvantaged students without access to the internet.
- Utilize and promote ASC-Farmington's location on the Navajo Nation to recruit and retain Native American students into the pipeline of agricultural sciences. Expand Navajo and underrepresented local undergraduate and graduate student researchers to expand the pipeline of the next generation of plant scientists and connect ASC-Farmington science back to surrounding communities.
- Serve as co-chairs/chairs on graduate student committees and serve as affiliate faculty for non-NMSU graduate students.

- Participate in Workforce Development through partnerships across NMSU, regional institutions, private industry, and workforce development programs.
- Use ASC-Farmington to collaboratively teach with on-campus faculty and use the ASC-Farmington facility as a center for learning and outdoor classroom.
- Broaden peer-to-peer student recruitment and mentoring opportunities in ACES utilizing ACES student ambassadors from the Four Corners Region mentored by ASC-Farmington faculty serving on undergraduate recruitment and retention committees.
- Help train a workforce transitioning from extractive industries to agricultural and agricultural service careers by integrating training opportunities into the Research experience.

Key Performance Indicators (KPIs)

Undergraduate Students	Year 1	Year 3	Year 5
• Tours and Field Experiences	30 students	40 students	50 students
• Individual mentoring (internships, special topic courses)	4 students	6 students	8 students
• High schools and career days visited for recruitment	2 events	4 events	7 events
Graduate Students			
• Chair/Co-chair	3 students	4 students	6 students
• Committee member	3 students	4 students	6 students
• Presentations at scientific conferences	6 events	8 events	12 events
• Courses taught, proctored, team-taught, special topics	2 courses	4 courses	8 courses

Leading Indicators

- Maintain and expand the number of external partnerships with regional institutions of higher learning supporting undergraduate and graduate students
- Number of graduate student committees served on
- Number of grant submissions with funding to support undergraduate interns, graduate student TA/RA lines, and traditional short courses
- Number of ASC-Farmington faculty serving on ACES departmental recruitment committees
- Number of student participants in ASC-Farmington research or summer fieldwork
- Number of underrepresented and Native American students recruited to NMSU
- Number of peer institution partnerships

GOAL 2: ELEVATE RESEARCH AND CREATIVITY

Research activities at the ASC-Farmington support community need across the Four Corners through an advisory committee and community input. Research activities are guided by faculty appointments housed under departments within ACES. ASC-Farmington is a collaborative unit,

with partnerships across state lines and sovereign nation borders (the Navajo Nation). Undergraduate and graduate students are an integral part of the research process.

Objective 2.1: Conduct research, teaching, and Extension programs on emerging issues.

Actions:

- Expand private/public partnerships and evaluate integrated agricultural tools and machinery to improve water and energy-use efficiency and mitigate the impacts of noxious weeds.
- Increase crop resiliency in a changing climate.
- Evaluate the post-harvest quality and value-added-chains to support niche local and regional economies.
- Broaden studies examining transects of Public Health, Agriculture, and the Environment to improve people's access to healthy foods and promote healthy lifestyles while protecting food safety.
- Evaluate transects of agriculture/energy/water in a changing climate through controlled environments, renewable energy, and enclosed, closed-loop systems within an urban-based food system.
- Develop transitional and certified organic integrated agricultural studies.
- Generate crop models to improve decisions for site selection, frost mitigation, planting dates, optimal planting density across a range of scale.

Objective 2.2: Address critical water use and conservation issues in New Mexico and beyond (national/international) using a science-based approach.

Actions:

- Conduct research utilizing technologies and data-driven decision-making tools in precision agriculture to reduce inputs, improve soil health, and reduce agricultural run-off.
- Explore beneficial use/recycling of water surface flows on San Juan County farms.
- Maintain environmental monitoring for the San Juan River watershed.
- Support innovative water use technologies and explore non-traditional water sources using water recycling/water desalination for irrigation.

Objective 2.3: Encourage and reward interdisciplinary and integrated relationships with other research efforts across the university and external partners, emphasizing both applied and fundamental methods for developing comprehensive solutions to relevant issues.

Actions:

- Foster collaborative research projects with other research institutions, industry, and farmers.
- Enhance collaboration with NMSU units, universities, colleges, and centers for workforce development, federal agencies, Navajo Nation agencies, private industry, and community interest groups.
- Work with the Navajo Nation Department of Health to develop protocols and research oversight for human research projects.
- Promote the ASC-Farmington for Water Research Resources Institute initiatives in the San Juan watershed.

Objective 2.4: Address critical environmental issues in New Mexico and beyond.

Actions:

- Expand watershed monitoring.
- Support cropping systems research that uses ASC-Farmington’s six center pivots in a cropping systems model integrating livestock, examining soil carbon sequestration and soil health, and reducing greenhouse gas emissions.
- Communicate the availability of ASC-Farmington to conduct renewable energy research and demonstration plots.
- Explore new markets to promote agroforestry, perennial crops for environmental services, renewable energy, riparian buffers, carbon sequestration or carbon cap and trade, value-added food, wildlife habitat, shade, and heat mitigation.
- Utilize ASC-Farmington for non-disturbance conservation, agroecological studies, perennial crop, and permaculture studies.
- Seek effective methods to control pests (e.g., prairie dogs).

Goal 2 Key Performance Indicators (KPIs)

	Year 1	Year 3	Year 5
Faculty			
• Proposals submitted (total \$ requested)	\$900,000	\$1,800,000	\$3,000,000
• Research funding (total \$ awarded and sources [Federal, State, Industry, Foundation, Other])	\$300,000	\$600,000	\$1,000,000
• Publications (refereed journals, plus AES and Extension publications)	12	16	24
• Number of joint/collaborative projects between ASCs	2	4	6
• Number of joint/collaborative projects between ASCs and main campus	5	10	15
• Number of joint/collaborative projects between ASC AES faculty and CES faculty	5	10	15
• Number of joint/collaborative projects between ASCs and governmental and other agencies	2	3	4
Undergraduate Students			
• Tours and Field Experiences	30 students	40 students	50 students
• Individual mentoring	4 students	6 students	8 students
Graduate Students			
• Chair/Co-chair	3 students	4 students	6 students
• Committee member	3 students	4 students	6 students
• Presentations at scientific conferences	6 events	8 events	12 events
• Courses taught, proctored, team-taught, special topics	2 courses	4 courses	8 courses

Dissemination/Outreach			
<ul style="list-style-type: none"> Contributions to intellectual property and technology innovation and transfer 			
<ul style="list-style-type: none"> Number of collaborative projects between ASCs and local community organizations 	4	6	8
<ul style="list-style-type: none"> Number of workshops/presentations/field tours 	2	4	6
<ul style="list-style-type: none"> Stakeholder events with scientists in attendance 	4	6	10
<ul style="list-style-type: none"> Formal advisory committee(s) meetings for feedback and advice 	2	4	4
<ul style="list-style-type: none"> Gift revenue (total \$) 	\$15,000	\$25,000	\$35,000

Leading Indicators

- Number of external faculty partnerships
- Number of science-based reports and disseminations addressing the needs of constituents
- Number of contributions to policy change at the local, Navajo Nation, state, and University level
- Number of NMSU and non-NMSU students mentored by ASC-Farmington faculty through employment, special topics, thesis, and dissertations
- In-kind and gift funding through public/private partnerships
- Collaborative proposals submitted (total \$ requested); proposals awarded
- Number of field days, tours, school visits for research dissemination

GOAL 3. AMPLIFY EXTENSION, OUTREACH, AND ECONOMIC AND COMMUNITY DEVELOPMENT

ASC-Farmington outreach extends ACES to surrounding Navajo and non-Navajo, rural and urban populations, large-scale commercial farming to back-yard gardens.

Objective 3.1: Develop innovative, multidisciplinary educational programming addressing issues that are relevant to New Mexico and expand the clientele base.

Actions:

- Engage advisory committee regarding community needs.
- Work with regional Extension services, including Colorado and Arizona.
- Expand human dimensional research to guide extension and outreach program development through validated surveys and focus groups.
- Develop inclusive multilingual outreach materials and tailor programming that encompass ASC-Farmington and San Juan County CES's unique multicultural service area.
- Formalize partnerships with area business and workforce development organizations.

Objective 3.2: Connect current research with the community.

Actions:

- Host workshops and field days that effectively communicate the work we do.
- Hold workshops to address specific environmental, health, wellness, and youth needs to be determined by communities in our service area.

- Produce ASC-Farmington interpretation materials that translate research to a non-academic audience and expand outreach to Navajo Communities at local government offices “Chapter Houses”, Master Gardener groups, schools, and community development forums.
- Improve websites, video, and digital resources describing the results of current research.
- Link social media presence to County Extension Offices.
- Develop opportunities for workforce development.

Goal 3 Key Performance Indicators (KPIs)

	Year 1	Year 3	Year 5
Faculty			
• Formal advisory committee(s) meetings for feedback and advice	2	4	4
• Publications (refereed journals, plus AES and Extension publications)	12	16	24
• Number of joint/collaborative projects between ASCs	2	4	6
• Number of joint/collaborative projects between ASCs and main campus	5	10	15
• Number of joint/collaborative projects between ASC AES faculty and CES faculty	5	10	15
• Number of joint/collaborative projects between ASCs and governmental and other agencies (e.g., national labs, USGS, NRCS, Soil and Water Conservation District)	2	3	4
Dissemination/Outreach			
• Number of collaborative projects between ASCs and local communities/community organizations	4	6	8
• Number of technology transfer/workshops/presentations/field tours	6	10	16
• Stakeholder events with scientists in attendance	4	6	10
• Number of website visits	2,400	3,600	5,000
• Number of social media visits	3,500	5,000	7,000
• Number of off-site participants	192	250	300
• Number of individual visitors	375	450	500
Workforce Development			
Continuing education credits (CEU) workshop days (e.g., NMDA Pesticide Applicator, Professional Society CEU)	1 event	2 events	3 events
Certificate offered		1 certificate	2 certificates

Community			
Community learning (e.g., Master Gardener CEUs, How-to-workshops)	1 event	2 events	3 events
Group educational tours and field days	2 event	4 events	6 events
Cooperative Grant submissions focused on workforce development	1	2	3

Leading Indicators

- Number of ASC-Farmington demonstration plots and number of on-farm or community-based demonstration plots
- Clientele contacts, workshops, courses, and field days: number of community contacts, visitors, tours, student visits, workshop, and community presentations
- Number of classroom visits
- Number of new and revised print materials in CES and AES reporting system
- Number of research-related articles appearing in trade magazines
- Number of advisory committee meetings
- Number of contributions to new digital apps or YouTube Videos
- Number of visitors to ASC-Farmington digital media sites (Google Analytics “hits”), including the number associated with a multicultural audience
- Number of collaborative grants and contracts with outreach components
- Number of testimonies given at Chapter House Farm Boards, Health and Education Boards, ditch company meetings, municipal/government/school boards by ASC-Farmington and associated personnel
- Number of special topic workshops and seminars
- Number of invited presentations
- Number of stakeholder events, meetings, and tradeshow attended
- Number of community, stakeholder, state, or national events attended

GOAL 4. BUILD A ROBUST UNIVERSITY BY IMPLEMENTING COLLEGE-WIDE, MISSION-SUPPORTING STRATEGIC INITIATIVES

Build a robust university by implementing college-wide, mission-supporting strategic initiatives within the Four Corners community and the San Juan Basin through collaboration within and external to ACES and NMSU.

Objective 4.1: Recruit undergraduate and graduate students and faculty globally and increase the recruitment from underrepresented groups.

Actions:

- Recruit from the Navajo Nation, women, and underrepresented groups for the next generation of ASC-Farmington staff.
- Create new workforce development and student internships.
- Support for educational outreach efforts that serve high schools with high percentages of students from underrepresented groups.

- Work with ACES and NMSU departments to create opportunities for local students to stay near Farmington for their educations.
- Target youth to develop pathways of future student connections to ACES and NMSU community and careers in agriculture.
- Participate as guest lectures in community health fairs, harvest festivals, and other community events and use these opportunities to recruit ACES students.

Objective 4.2: Expand a K–20 outreach program, inclusive of 4-H, focused on increasing participation and underrepresented groups to increase student awareness and participation in ACES programs and associated careers.

Actions:

- Facilitate access to the internet as an NMSU network extension to NMSU undergraduate students.
- Utilize K-12 visits and career days, field days, and presentations as a platform to recruit ACES students.

Objective 4.3: Encourage interdisciplinary and integrated management approaches in planning and implementing programs, emphasizing both applied and fundamental methods for developing comprehensive solutions to important issues.

Actions:

- Expand partnership with NAPI to include sharing farm.
- Encourage the formation of interdisciplinary teams across the AES/ACES System to share ideas and resources, expand multi-site trials, and share graduate students.
- Collaborate with ACES departments to develop transdisciplinary initiatives for digital and prescriptive agriculture, New Mexico agriculture value-chain enhancement, agricultural literacy initiative, and youth development via online learning and STEM programming.

Objective 4.4: Elevate and promote the impacts and visibility of the AES and ASCs.

Actions:

- Update brochures, website, and social media presence to communicate current ASC-Farmington efforts, including uniform branding with Cooperative Extension Service.
- Communicate to local, state, and First Nation policymakers the impacts of ASC-Farmington activities through science-based reports, publications, and testimony.
- Disseminate Navajo Nation Human Research Review Board-approved projects to the Navajo Nation Health, Education, and Human Services Committee members comprised of elected Council Delegates and the Navajo Nation Health Department, and share ASC-Farmington research impacts to the Navajo Nation Resources and Development Committee and Navajo Nation Department of Agriculture.
- Promote and market academic programs in ACES at public events to inform our constituents of career opportunities with an ACES degree.
- Continue to upgrade digital technologies to facilitate ASC-Farmington as an extension of the ACES main campus to promote year-round graduate student research in Farmington.

Objective 4.5: Continue a targeted involvement in multistate, regional, and international

programs.

Actions:

- Promote the Four Corners region for multistate and international research, teaching, and extension activities among ACES and other NMSU departments.
- Promote Farmington for broad disciplinary work by working with Navajo Technical University, Diné College, Fort Lewis College, and San Juan College colleagues.

Objective 4.6: Increase the level of support for ACES from the citizens of New Mexico; local, state, and federal governments and agencies; private corporations; foundations; and alumni.

Actions:

- Invite the Four Corners NMSU Alumni Association members to facility events.
- Participate with constituency and lay groups within cooperative ventures and coalition-building activities in the ASC-Farmington service area

Objective 4.7: Encourage and cultivate staff excellence, and support staff training, development, and recognition.

Actions:

- Increase grant writing for professional development activities.
- Promote the opportunity to offer NMSU Training Central courses in Farmington remotely through live video instruction alongside traditional classroom peers.
- Encourage ASC-Farmington staff to take opportunities in local professional development.
- Facilitate local and regional professional development training opportunities with neighboring institutions.
- Mentor the next ASC-Farmington leaders

GOAL 4 Key Performance Indicators (KPIs)

	Year 1	Year 3	Year 5
Communications	<ul style="list-style-type: none"> • Two AES/CES numbered reports per year • Two popular press news story per year • One presentation to elected officials 	<ul style="list-style-type: none"> • Two AES/CES numbered reports per year • Two popular press news story per year • Two presentations to elected officials 	<ul style="list-style-type: none"> • Two AES/CES numbered reports per year • At least two popular press news story per year • Three presentations to elected officials
Workforce to Graduate Students	<ul style="list-style-type: none"> • Five new tables and 25 new chairs in “Dry Lab” to transition the space for indoor classes 	<ul style="list-style-type: none"> • Digitally connected classroom in Dry Lab to hold up to 20 students • Dedicate one office to graduate/intern student space 	<ul style="list-style-type: none"> • Two graduate students living and working in Farmington year-round

Staff	<ul style="list-style-type: none"> • Write grant to provide professional development training for 1 staff member 	Write grant to provide professional development training for 1 staff member	Write grant to provide professional development training for 1 staff member
Farm Management (Shop and Outbuildings)	<ul style="list-style-type: none"> • Storage solutions purchased for tools and equipment 	<ul style="list-style-type: none"> • Renovate shop office and bathroom space • Third Bay Loading Dock purged. • Auction all unused junk and equipment • Paint exterior building 	<ul style="list-style-type: none"> • New septic system

Leading Indicators

- Number of hosted and invited events
- Number of communications to the public in outreach booths, field days, print, radio, web-based, and social media
- Number of community/local, state, and Navajo Nation (Chapter House/Agency/Executive Tribal Government-level) testimony invites and presentations on governmental agendas
- Number of expenditures on targeted infrastructure and human capital projects through hard money and soft money through legislative initiatives, grants, contracts, and public-private partnerships
- Number of staff participating in professional development activities
- Number of staff holding professional certifications
- Number of collaborative research and outreach activities
- Number of participants in cooperative ventures and coalition-building to increase resource support for ASC-Farmington