



NORMAN MARTIN

**Peanut precision:** Naveen Puppala, left, a peanut breeder with NMSU's Agricultural Science Center at Clovis, has spent years rolling out a new program that takes promising breeding lines from around the globe and crosses them with New Mexico-grown varieties. Above, Puppala completes crossbreeding for an experimental peanut variety.

in southeastern New Mexico, Flynn conducted extensive research on using manure as fertilizer for crops.

"Cows are great alfalfa-processing machines that make milk, cream and cheese, but then manure comes out the other end," Flynn says. "New Mexico dairies have more than 3 million tons of manure to deal with annually."

Flynn helped develop new software that recommends specific manure application rates for growers based on crop information, soil test data, yield goals and manure nutrient values.

Researchers also carry out continuous variety trials. "That's essential," Flynn says. "Just because a crop does well in Farmington doesn't mean it will grow well here."

At the Clovis science center, 120 miles northeast of Artesia, NMSU is asking the state Legislature for an annual budget increase to help eastern New Mexico growers adapt to changing conditions, particularly dwindling water supplies.

At Clovis, researchers have concentrated on dryland and irrigated farming, and on specialty crops

such as peanuts—an economic mainstay for local growers. In fact, the Valencia A and C varieties NMSU scientists released 25 years ago still grow in 90 percent of peanut fields here, says Naveen Puppala, peanut breeder at the

Clovis science center.

But drought and declining water levels in the Ogallala Aquifer make research on water-efficient irrigation essential in eastern New Mexico, home to more than half the state's irrigated cropland.



**Irrigation options:** Scientists at NMSU's Agricultural Science Center at Farmington are studying water requirements for alfalfa, grown on more than half of the irrigated acreage in San Juan County.



## Fabian Garcia's Living Legacy



Over a 50-year research career, Fabian Garcia, the first director of NMSU's Agricultural Experiment Station, visited farmers and ranchers throughout the state to discuss agricultural problems in English and Spanish. When he died in 1948, Garcia was beloved by citizens in Albuquerque, Bluewater and Las Vegas, as well as southern New Mexico.

These days, New Mexicans can see ongoing

research on two of Garcia's signature crops—chile peppers and grano onions—at NMSU's Fabian Garcia Research Center, just west of campus. Chile research is under way in the greenhouses, onions grow in the fields and pecan trees Garcia planted are still producing.

In the spring, aspiring landscapers can see how a variety of trees, flowers and grasses grow in the public demonstration garden and turf plots. In the fall, visitors flock to a breathtaking array of 150 different pepper varieties in one of the world's largest ornamental chile gardens.

A man for all seasons, Garcia bred milder chile to appeal to a wider array of palates, supplying the ingredients for the Mexican food industry. Rather than experiment with traditional dark pods, he chose red chile, now used worldwide in natural colorings. He released a pecan variety, did cotton research, bred grano onions that were forerunners of today's high-yielding varieties and developed a ridge-furrow system to minimize disease damage from chile wilt.

A member of the university's first graduating class in 1894, Garcia accepted an agricultural research position the following year and remained connected to his alma mater throughout his life. From 1913 to 1945, he led the

"We're hoping to beef up our programs to address issues related to the availability of water," says Rex Kirksey, acting center superintendent.

The New Mexico Legislature approved partial funding to hire new faculty in agronomy, water, dairy and soil science. The legislation was sent to Gov. Bill Richardson for approval.

Another \$35,000 for irrigation improvements at NMSU's science

center at Tucumcari also awaits Richardson's signature. Research at Tucumcari, 70 miles north of Clovis, is focused on irrigated pastures, low water-use forages and rotational grazing. The center—NMSU's oldest—is home to the annual Tucumcari Bull Test and performance-tested sale that began 40 years ago.

In the semiarid Four Corners, the Farmington science center conducts

research on water-efficient irrigation and drought-resistant crops.

"San Juan County ranks second statewide in irrigated cropland, so water issues are the backdrop of nearly everything we do," says Mick O'Neill, center superintendent.

Farmington scientists studied irrigation requirements for dozens of local crops, particularly alfalfa varieties, which are grown on

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**Living legacy:** NMSU's Fabian Garcia Research Center is named for the late director of the Agricultural Experiment Station, left, who did groundbreaking work on chile, onions, pecans and cotton. Danise Coon, a senior research assistant, picks a pod from the center's ornamental chile garden, near greenhouses where chile studies continue.

Experiment Station—the first Hispanic to do so.

Garcia, a naturalized U.S. citizen from Mexico, was orphaned as a child. Throughout his career, he provided encouragement, gifts and loans to students, along with housing at the farm.

Though Garcia tried to continue working from a hospital bed, Parkinson's disease forced him to retire in 1945. The Experiment Station's annual report that year was dedicated to Garcia: "His is indeed a record of outstanding achievement and service to agriculture and to the people of New Mexico." In his will, Garcia left \$85,000 to the university to assist needy students.

*D'Lyn Ford*



50 percent of the county's irrigated farmland, O'Neill says. Subsurface and surface drip irrigation studies are under way for a variety of crops.

Researchers compared water use by cool- and warm-season grasses to help local gardeners and landscapers choose drought-resistant varieties. In 2002, the center planted the first xeric demonstration garden in the Four Corners, showcasing 90 species.

Researchers have studied native and nonnative grasses for reclamation of disturbed land at gas and oil well sites. They've also tested herbicide mixtures and varying application times to help local growers better control weeds.



**Analyzing alfalfa:** Marjorie Yazzie uses a carbon, nitrogen and sulfur forage analyzer to test alfalfa quality at the Navajo Agricultural Products Industry's Agricultural Testing and Research Lab.

Variety trials are constant. "We've tested more than 1,000 crop and horticulture varieties since this center began operating in 1966," O'Neill says.

Between 1970 and 2000, San Juan County yields of potatoes, corn, wheat and alfalfa increased 350, 170, 139 and 69 percent, respectively, O'Neill says. "We can't take credit for everything, but a lot of those increases are the direct result of growing practices we've developed at the center."

The center is located on the Navajo Nation, and most research directly benefits the Navajo Agricultural Products Industry (NAPI). "Just about anything that is currently grown by NAPI was first tested at the Farmington science center," Daugherty says.

John Keenan, former director of NAPI's agricultural research and testing lab, says NMSU helped NAPI choose the best crop varieties while improving its irrigation methods and growing techniques.

In the Middle Rio Grande Valley, the Los Lunas science center directs most of its research to the needs of small- and medium-scale growers, says Mike English, an entomologist and center superintendent.

"In areas like Clovis, researchers tend to focus on 'macro' agriculture—farming commodity crops on a large scale," English says. "Here in Los Lunas, our producers have smaller farms. They are looking to fill niche markets."

The center does variety trials for crops ranging from alfalfa and alternative forages to wine grapes, pumpkins and blue corn.



**Lend an ear:** Entomologist Mike English, superintendent of NMSU's Agricultural Science Center at Los Lunas, holds insect-resistant Bt corn being tested at the center.

Scientists tested genetically altered corn to develop pest-resistant varieties. They experiment with water-efficient irrigation, including solar pumps, drip systems and plastic mulches, English says.

The U.S. Department of Agriculture's Plant Materials Center is housed at the Los Lunas center, creating a unique opportunity for NMSU and USDA researchers to collaborate on developing drought-tolerant plants for conservation and landscaping. The center tested more than 40 varieties of native grasses, many of which are now used in reclamation and landscaping for highway beautification, erosion control and rehabilitation of disturbed land at mines and oil fields.