The Seeds of a Hot Market

Producer focuses on genetics

by Nancy Riggs

Ed Curry easily switches between English and Spanish while talking with customers from his Pearce, Ariz., office. That ability is important to Curry Seed & Chile Co., because a significant portion of their chile seeds go to growers in Mexico.

The "Chile Belt" cuts across the Texas Rio Grande Valley, southern New Mexico, southeastern Arizona, parts of California and northern Chihuahua, Mexico. Chile is grown best at altitudes of 3,500 to 4,500 feet, where cool nights are the norm. While New Mexico is first in chile production, Arizona grows just under 6,000 acres of chile with a value of about $9.7 million, mostly in the Sulphur Springs Valley in the southeastern part of the state.

Curry said, "We provide 80 or 90 percent of the green chile industry with seed. We're working to improve genetics to provide more efficiency for the growers and flavor for the consumer."

A lifelong interest in chile genetics has led Curry to develop ones that can be produced with uniform quality, flavor and heat. He grows chile and other crops on his land in the Sulphur Springs Valley near Pearce, and although other crops—alfalfa, milo, maize, squash and watermelon, to name a few—are profitable, Curry's real love is chile. He is well-known within the industry for his work in chile genetics and is a frequent presenter at professional meetings. Careful plant breeding has benefited not only his chile seed operation, but also industry-wide growers. Curry has worked with researchers from the University of Arizona, New Mexico State University and Texas A & M University.

Genetics key to uniformity

"I grew up in the chile field," said Curry.

His parents planted their first chile crop in 1957. "It failed," Curry said. "It's very difficult to get a stand of chile." They planted another crop in 1958, which was successful,

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and have continued to grow chiles ever since. Curry recalled flying with his father and a friend to a seed farm in Hatch, N.M., when he was 8 years old. "Genetics made a real impression on me," he said.

That led to his development of chiles that offered consistency. He has worked with partner Phil Villa, a well-known chile breeder, for about 25 years. "We stabilized the heat and had the seed for the Arizona 20 green chile variety in the 1980s. We released it in 1993," Curry said. "We nearly doubled the average yield, which was averaging 8 tons per acre prior to our releasing Arizona 20. The yield is now averaging 14 to 15 tons. Our top growers have reached 35-plus tons."

Curry Seed has followed with other varieties of green chile, as well as red, jalapeno, paprika and cayenne chile. Curry plants an average of 600 acres of irrigated chile.

"We use old-fashioned Mendelian genetics," Curry said in describing the selection process for crosses in developing the varieties.

"I learned about genetics here on the farm and from my partner, Phil Villa," Curry said. He and Villa have contributed significantly to chile's popularity moving out of its traditional Southwest setting and into the Midwest and East. Stabilizing the heat was a major step because the heat of chiles varied greatly. For restaurants and processors, uniform heat was essential, and Curry's work in genetics also provided a more uniform quality. Once the heat and flavor were dependable, interest in chiles for various products surged, and chile has now passed ketchup in use as a condiment.

Developing an integrated crop management plan

Chile growers have pretty much relied on good growing conditions coming together to produce consistency in their chile plants, using their past experience to know when to add water and fertilizers. That consistency is essential to canning and dry processors, as well as to grocers.

For the past 18 years, Curry has worked closely with Dr. Jeff Silvertooth, an agronomist and soil scientist with University of Arizona (UA). Curry's farm has become a working laboratory in Silvertooth's project to develop a chile crop management plan.

In earlier work, Silvertooth developed a method to help southwestern cotton growers monitor and predict various stages in cotton plants. The plan measures heat units accumulated in the plants following planting (HUAP) for plant growth at specific stages. Silvertooth is working with Curry's crops to develop a similar plan for chiles. The chile stages identified by progressive heat units include leaf and crown formation, peak bloom, early pod set, pod maturity and the transition from green to red.

Ed Curry examines seed during the seed washing process.

"Plants respond to heat conditions," Silvertooth said. "Plants don't respond to the calendar or length of time after planting." Silvertooth heads up the Soil, Water and Environmental Sciences Department at UA, and after 15 years working in cotton, was looking for a new niche to continue his interest in research while meeting department head responsibilities.

"Three things are important in growing chile," he said. "You have to have good genetics; you need good water management because there's a narrow range for water for chiles; disease is the third important consideration."

Silvertooth spends extensive time, particularly in the summer growing season, at Curry's farm documenting just how the chile crop is responding to various conditions. He and colleagues, including sons David and Jason, both UA engineering students, are working to establish baseline figures for the heat units at the various stages to develop an integrated crop management plan as a tool for growers. Growers can then follow the plan in timing their irrigation and fertilizer applications.

Curry noted the importance to all growers of the crop management plan for chile. "It takes a lot of work to get all this information documented, and David and Jason are out here working extremely hard in recording how the crop is responding at

Chile in a harvester block trial for improved de-stemmability and adaptability to a harvester.

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Chile grows in Curry's fields.

different times to help in developing those baseline figures needed for the plan," Curry said.

Sustainable land management is necessary

Chile crops must be rotated every year with five to six years between crops to avoid some of the disease problems associated with chiles. Disease continues to be a concern in all crops, and chile is especially vulnerable to fluctuations in growing conditions. The fungus *Phytophthora capsici* has been a significant concern. Xanthamonas, commonly known as bacterial spot, is also a concern. Genetics play a role in disease avoidance, with some varieties more resistant than others. However, Curry pointed out that growing conditions have a major impact on disease development.

The past two years have been unusually rainy in the Southwest and have produced an increase in disease. Curry said, "Seed storage amounts are short now because yields have been down with the rainy years we have had."

Irrigation techniques continue to evolve, and Curry uses both center pivot and underground drip irrigation. While drip irrigation is often considered more efficient, Curry noted that newer technology has improved center pivot irrigation to where the two methods are almost equal. "With the new 30-inch drop, center pivot is just about as efficient as drip," Curry said. He noted that center pivot irrigation has some advantage in controlling powdery mildew. "Center pivot irrigation water actually washes it off the plant and drip irrigation doesn't," he said.

Expanding avenues

Extracting seeds from chile pods leaves a great deal of excellent chile pulp as a byproduct. After harvesting, chiles are washed and crushed. Seeds float to the top, and the remaining pulp is washed and moved on to dry, cannery or mash processing. Seeds are cleaned and any light, or bad, seeds removed.

With a short window of time to process that pulp, Curry found a solution in partnering with Jeanie Neubauer, who wanted to expand her Santa Cruz Chili product business. By setting up the processing at Curry's farm site, the need for pulp transportation is eliminated.

To keep up with the increasing amount of pulp from the rapidly growing seed company, Curry began dehydrating the pulp into powder.

Curry continues to work extensively in genetics, looking for that next variety with a slightly more unique flavor, better yield and consistent heat. He sees potential for disease resistance in genetic modification research and is working with NMSU researchers looking at that avenue.

Chile field trials are looking at improving the de-stemmability of chile plants to accommodate mechanized harvesting, as well as plant habits that will adapt to the harvester. Curry said, "Mechanized harvesting is going to be necessary with our continued labor limitations. We are under extreme pressure due to the lack of a workable immigration policy to provide the needed labor."

Curry was a founding member of the New Mexico Chile Association, originally organized as the New Mexico Chile Task Force. The organization hosts members from the Chile Belt states of New Mexico, Texas and Arizona.

Nancy Riggs is a freelance writer and frequent contributor to Moose River Media. She resides in Mt. Zion, Ill.

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