

New Mexico chile industry looks to thrive again

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The New Mexico chile pepper industry is working to survive its challenges and thrive again through research initiatives aimed to reduce production and processing costs.

Foreign competition over the last two decades has created a sinking effect of Titanic proportions in New Mexico chile acreage. Acreage sank from 35,000 harvested acres in 1992 to 11,000 acres in 2008. Last year acreage edged higher to 12,500 acres.

The two-thirds acreage reduction is a tough loss in New Mexico, the nation's top chile-producing state, where the spicy vegetable is the state's signature crop.

Gene Baca, president, New Mexico Chile Association (NMCA), places the blame on the North American Free Trade Agreement (NAFTA) implemented in 1994.

"That's when the bottom fell out," Baca said. "We went straight down."

"Foreign countries can sell red chile cheaper than we can produce it. That's scary," Baca said. "Foreign companies take advantage of reduced regulations. The U.S. has more regulations in chile production, but that's not a bad thing to ensure food safety. U.S. regulations make it

more expensive to produce chile."

About 80 percent of chile peppers consumed in the United States are imported, mostly from China, India, Peru and Mexico. China sends far more chile to the U.S. than Mexico.

The New Mexico chile industry has a broad range of initiatives in place to reduce production and processing costs to increase profitability and acreage.

"We are finding solutions to our problems," Baca told chile growers, processors, suppliers, and other industry members during the 2010 New Mexico Chile Conference in Las Cruces, N.M.

"Chile consumption is skyrocketing," Baca explained. "The world is learning what we have known all along — once you try New Mexico chile you can't live without it."

Baca is senior vice president at Bueno Foods in Albuquerque, N.M.

U.S. chile growers harvested 28,500 acres of peppers in 2009, according to the National Agricultural Statistics Service. New Mexico ranked first (12,500 acres) followed by Texas (7,300 acres), California (5,800 acres), and Arizona (2,900 acres). California's chile crop had the highest dollar value at \$50 million.

The NMCA was formed in 2006 to succeed New Mexico State University's (NMSU) Chile Task Force. In part so the non-profit NMCA could lobby state officials for funding dollars.

machine handling.

"Chile is great, but it's a tough product," Baca said. "It's crooked, it's straight, it's a strange shape, and it's notoriously difficult to find automated solutions."

Most red chile is mechanically harvested, de-stemmed, and used for processing.

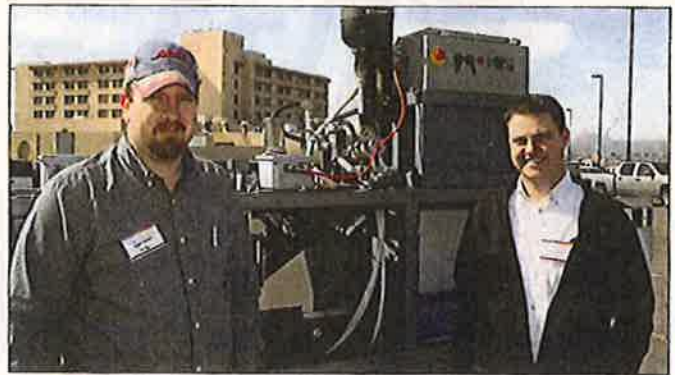
About 90 percent of the green chile crop is grown for processing. Green chile is typically picked and de-stemmed by hand which increases labor costs. Over the last few years several mechanical harvesters were developed for green chile with good results. The final push has been the development of a green chile de-stemmer.

The NMCA charged NMSU's Manufacturing Technology and Engineering Center (MTEC) with developing de-stemmer prototypes. After five years and a handful of prototype designs and testing, the industry has asked M-

"We don't just ask for government money," Baca explained. "Private companies have also developed equipment and solutions."

The NMCA has successfully raised dollars to further fund research on chile varieties, pest and disease control, mechanization, and other issues.

Keys to the chile industry regaining its early 1990s advantage include developing mechanization and chile breeding to better withstand



STANDING BY the new green chile de-stemming machine are engineers Ryan Herbon, left, and Dale Cillesten, Manufacturing Technology and Engineering Center, New Mexico State University, Las Cruces, N.M.



CHILE PEPPER growers attending the conference, from left: Jerry Franzoy, Chile River Inc.; and Jim and Faron Lytle, Solar Farms, both from Hatch, N.M.



NEW MEXICO Chile Association board members include President Gene Baca, Bueno Foods, Albuquerque, N.M.; Treasurer Dino Cervantes, Cervantes Enterprises, La Mesa, N.M.; and Rick Ledbetter, board member, 2-7 Farms, Portales, N.M.



LEROY DAUGHERTY, center, associate dean and director, New Mexico State University (NMSU) Agricultural Experiment Station, receives an award for his contributions to the chile industry from the Chile Pepper Institute (CPI). Pictured are Stephanie Walker, NMSU Extension vegetable specialist, and Paul Bosland, CPI director, all of Las Cruces, N.M.



PARTICIPANTS at the New Mexico Chile Conference, from left: Andy Wiles, ConAgra Foods; Ray Pennock, Bueno Foods; and Bill Cox, Coxco Ag Services, all of Las Cruces.

TEC to build a full-scale model of its computer-controlled, knife-blade cutter machine. The machine could be tested in the processing industry this fall.

"The chile pods are fed in a straight line into the machine where a video camera records an image of each chile," said Ryan Herbon, M-TEC's project leader. "A computer identifies the precise cut location on each pod and the cutter mechanism cuts off the stem."

The M-TEC team, including Herbon, Dale Cillessen, and Eduardo Gamillo, hope to tweak the machine to achieve a 95 percent efficiency rate.

Consumer, and Environmental Sciences.

Baca and other industry leaders are poised to rebuild New Mexico's chile industry as a lower-cost producer able to economically compete against foreign competition.

"We don't want this industry to just survive," Baca said. "We want it to thrive again."

During a weed science presentation, NMSU weed scientist Jill Schroeder said weeds are often overlooked as a critical issue for chile growers since weeds are always present in the field. Weeds increase crop water requirements, labor needs, and disease issues.

Among the most common weeds in chile are broadleaves including spurred anoda (*Anoda cristata*), Wright's groundcherry (*Physalis wrightii*), tall morningglory (*Ipomoea purpurea*),

and Palmer amaranth (*Amaranthus palmeri*).

Weeds are a problem since direct-seeded chile plants grow slowly. Schroeder says weed management alternatives are limited, including non-economical plastic mulches, mechanical cultivation and hand weeding with less than ideal success, and the limited availability of herbicides.

Herbicides are not available for broadleaf and nutsedge control during the emergence-to-thinning period.

"We've found even if you keep the crop weed free until thinning it still isn't enough to prevent yield losses from broadleaf weeds that emerge after thinning," Schroeder said.

Late-season weeds caused a 19 percent to 76 percent chile yield loss, depending on density,

in a Schroeder field trial.

Weeds serve as hosts for insects, diseases, viruses, and nematodes. Crop rotation is a successful tool to control weed-nematode pest complexes in chile.

"The more you can vary the planting and harvesting dates in a crop rotation then the more the weed life cycles are disrupted," Schroeder said. "Growers should include competitive crops that out compete the weeds."

In field tests from 1997-2001 Schroeder rotated alfalfa and cotton in separate fields with chile.

"The chile yield doubled after the three-year alfalfa rotation," Schroeder explained.

"The main reason was the suppression of the nutsedge-nematode pest complex."

"Chile consumption is skyrocketing. The world is learning what we have known all along – once you try New Mexico chile you can't live without it."

"I think this is a very doable goal," Herbon said. "We feel confident we can get it done."

Other tools fueling New Mexico's path to chile resurgence include research on fertilization, plant bed fumigation, weed control, and breeding, plus discussions on the possible development of a genetically-modified chile.

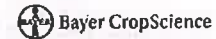
"You cannot be afraid of science," Baca said. "You have to understand chile, the genetics, and then make a decision on what works and is safe for consumers. We're listening to consumers and criticism, but we think we need to understand the entire issue."

Looking at long-term solutions, NMSU has raised and allocated about \$200,000 for the creation of an endowed chair for chile research, reported Mark Gladden, director of development for the university's College of Agricultural,

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Efficiency

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"This is where demands to increase the sustainability of agriculture are leading us," says Shaw. "It's a consequence of our population growth, and the planetary needs of this growth, which will see 2 billion more people by 2050—more than 100 million right here in the United States."

Monsanto also has embraced sustainability as a core part of its agriculture business and has applied the World Commission on the Environment and Development's definition of sustainable "development that meets the needs of the present without compromising the ability of future generations to meet their own needs," to agriculture.

"Our challenge is to produce more food over the next 50 years than has been consumed since the dawn of agriculture while protecting and enhancing our only environment," said Michael Doane, who leads Monsanto's sustainable agriculture efforts. "How do we surmount these obstacles? Agricultural innovation holds a key solution, and Monsanto pledges to do our part."

Doane points out that in 1960 the average acre of land, globally, supported 1 person and that almost doubled, increasing to 1.8 persons in 2005. He estimates that by 2050 an acre of land will need to support between 2.4 and 2.6 people.

It's a trend that's been accelerating for more than 50 years. "From 1950 through 2000, the world population doubled," Percy said. By 2050, the world will include 9 billion people. Socio-economic changes, including increased buying power, especially in developing countries, will put better quality food within reach of more people.

At the same time, "the availability of arable land for crop production will decrease," Percy said. Some of that acreage will be converted



IMPROVED EFFICIENCY for irrigation systems and water use in general will be crucial to agriculture's sustainability.

from food production to feedstocks for bio-fuels. Improvements in food productivity will be necessary. "In 2007 and 2008, food prices went up and food riots occurred in some plac-

es. Prices have moderated but the underlying trend is still evident."

Shaw says meeting the demands of a growing population is nothing new to agricul-

ture. Today the American farmer feeds an average of 144 people, almost an eight-fold increase from 1940. Most of the increase has come from higher yields. Per-acre production of corn, for example, has doubled since 1970.

"The goal is still more bushels, bales or pounds per acre," says Shaw. "But this time around, yield increases must be achieved against a backdrop of limited, and in some cases, diminishing natural resources, from the obvious inputs, such as topsoil and water, to the less obvious, like ecosystems that support the bee populations that pollinate our crops."

"Innovation," Percy said, "will be the key to meeting those increased food demand challenges. More food on fewer acres means producers will have to manage resources better. They will have to increase yield and do a better job with water management."

He said industry will have to develop better products, including plants with more tolerance to stresses such as drought, cold and heat for agriculture to become more sustainable and more efficient.

He said Bayer (and other companies) will need to increase research and development budgets to create new traits for seeds, new agro-chemicals and biological crop protection products. Cereal crops will be a new target. "Products for wheat, for instance, are falling behind as other crops enjoy increased profitability," he said, even though wheat acreage is higher than any other crop.

Percy said sustainability will be a key. "We have to meet the needs of today without compromising the future. Economy, ecology and society all play roles in sustainability. We must develop innovative, environmentally friendly products. And we must practice product stewardship and be mindful of healthy nutrition, public health and hygiene."

Shaw agrees and contends that farmers can be both eco-friendly and profitable.

"It's already happening," she says. "Productivity must be a key component of sustainable agriculture. Every acre that produces more food, feed and fiber helps to keep another acre in its natural habitat, preserving natural landscapes that are essential for ecosystem balance."

The difference today is the way we measure production, she says. "We need (to measure) beyond bushels per acre. How much land are we using? How much water? How much energy? What is the effect on soil health and water quality? With a new yardstick in place, we must incorporate environmental initiatives in a way that preserves grower profitability."

"We're not re-inventing the wheel, but building on what's already out there," says Terry Stone, sustainability value chain manager with Syngenta. He says more than two-thirds of cotton growers use some form of conservation tillage, which not only prevents soil erosion but also saves energy and water. Many also have begun rotating crops as well as modes of action to manage weed and insect resistance, protect beneficial insects, and increase yields.

Monsanto has developed new principles to guide its sustainability efforts.

"We found three core areas that impact the sustainability of agriculture — producing more, conserving more and improving the lives of farmers," Doane said. "We see it as a three-prong approach and put goals in place for each area."

Monsanto put those initiatives in place two years ago and now focus on accomplishments by 2030. Initiatives include:

Developing improved seeds for corn, soybeans, cotton, and spring-planted canola to help farmers double yields from 2000 levels, with a \$10 million grant pledged to improve wheat and rice yields.



INCREASED YIELDS per acre will be necessary to feed a rapidly growing world population, say agriculture industry spokespersons.