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Chile industry seeks better production

Conference highlights new theories

By Marvin Tessneer
Sun-News BUSINESS

Plant diseases specialists are working on new theories that they hope will develop into better protection for New Mexico's chile industry, they said during the recent International Chile Conference that was held at the Las Cruces Hilton.

They are working with the idea that the best management practices that are successful now were at one time just theories.

The Chile Pepper Institute sponsored the annual program.

Natalie Goldberg said during the afternoon Breakout Session that specialists have learned that Brassica crops, such as cabbage and broccoli, emit chemicals that are toxic to soil fungi and nematodes, microscopic worms that attack plant roots.

Goldberg is with the New Mexico State University's Extension Plant Sciences.

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Four-year-old Boo Bleyer, son of Ransom Bleyer, Hatch chile farmer and owner of the Crazy Gringo Chile Company, stands on a Boese chile harvester outside the Las Cruces Hilton on Tuesday. Sun-News photo by Vladimir Chalco

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The university is growing a broccoli cover crop on a private field north of Las Cruces as an experiment. The broccoli plants will be plowed under to learn if the theory that the residue emit toxins that kill fungi and nematodes actually works.

Goldberg said farmers in California have been growing broccoli and cabbage as rotation crops to leave these toxins in the soil to control fungi and nematodes.

She emphasized that the NMSU Brassica program is an experiment, but she added:

"California farmers have had 10 years of work with this theory, and we're using their information as a basis to conduct this experiment."

Goldberg also discussed powdery mildew, phytophthora and verticillium wilt problems with chile.

Powdery mildew is spread by wind, rain and high humidity. Excessive furrow irrigation can build up humidity under plant canopies, providing a host for this fungus.

The fungus causes the chile leaves to curl, exposing chile pods to sun burn, which can result in fruit rot, she said.

Management to check this fungus, she advised, is adequate plant thinning to allow air circulation and careful water management to prevent excessive humidity.

She also said that some chile growers have reported that powdery mildew spores can be spread from other fields on the trousers of field workers.

Phytophthora is a soil-borne disease that usually is spread through fields in water running down the furrows. It becomes especially severe in heavy soils that do not absorb water quickly.

The symptoms of this fungus are foliage blight and root and pod rot, which eventually kills the plant.

Control methods include raised seed beds, alternative row irrigation and a field crop rotation at least every four years.

Verticillium wilt is another soil-borne fungus that clogs the plants' vascular system. Once infected with this fungus the plants quickly die.

The prevention advice for this damaging fungus is field crop rotation, a minimum of four years, Goldberg said.

Another theory that plant specialists are researching is that a heavy fall rainfall resulting in excessive weed growth produces a good food source to help the beet leaf hop-

per survive the winter. This insect is identified as the vector that spreads the curly top virus in chile fields.

The weed-leaf hopper theory was discussed by Dr. Rebecca Creamer, a NMSU virologist, during the Break-out Session.

The curly top virus kills the chile plant by drawing energy from the plant to feed itself.

"The virus uses energy from the plant to grow more virus," she explained.

The virus usually infects young plants, stunts the growth and prevents fruit set.

The advice, at this stage of research, is more effective weed control to remove this food source for the leaf hopper, Creamer said.

"We're working on the theory that, based on the amount of rainfall in the fall and the weed growth that will help the leaf hopper over-winter we'll be able to predict the curly top virus rate in the following chile season," Creamer said.

In addition to removing weeds from chile fields, Creamer advised controlling weed growth adjacent to fields.

Leaf hoppers, the only known curly top virus vectors, are feeders of opportunity. They like to feed on green tumble weeds and London docket.

"But if they see a lot of fresh green chile plants around and they don't have to fly very far to get to them, that's what they'll eat," Creamer said.

Steve Thomas, a NMSU plant research professor, said that farmers will never be able to rid their fields completely of root knot nematodes. Nematodes, microscopic worms, deposit nodes on the plant roots that clog up the nutrient systems.

But there are controls. One method is treating the chile field soils for nematodes before planting.

"Don't wait until you see the symptoms," Thomas said. "By that time it's too late."

Another nematode control is removing nut sedge grass from the fields. Scientists have learned that the microscopic worms survive on nut sedge tubers, and they can spread from the tubers throughout the fields to chile roots, Thomas said.

"The best management is to get rid of the nut sedge the year before you put the field into chile and to take soil samples in the fall to see if you have nematodes," Thomas said.

In other conference educational discussions:

Mark Bennett of Ohio State Uni-

versity's Department of Horticulture, described the advantages of chile transplanting instead of seeding:

Higher fruit numbers, better root establishment, earlier fruit maturing, more uniform stands, better tolerance of seasonal stress and more consistent maturing that reduces hand harvesting labor costs.

One attraction that transplanting has for chile growers is that seeds for improved varieties for better yields and varieties with built-in disease resistance are very expensive.

Researchers at the Leyendecker Plant Science Center have developed a cayenne variety, NuMex Nematador, that shows resistance to soil nematodes, Dr. Eric Votava, senior research specialist, reported.

The development is important since methyl bromide, a soil treatment chemical that was effective against nematodes, has been banned. And chemicals to treat soil for nematodes are expensive, increasing production costs up to \$100 an acre.

The breeding programs that resulted with the NuMex Nematador started six years ago.

Researchers started with a popular cayenne known as Large Red Thick, a large-fruited pod that was easily harvested. But it was susceptible to nematodes that can reduce yields from 30 to 100 percent, according to Paul Bosland, NMSU chile researcher.

Researchers learned that the nematode resistance is controlled by a single dominant gene in combination with modifiers, according to

Yayah Zewdie, a NMSU post-doctoral agronomy researcher, who worked on the study for several years.

"Because of this it was relatively easy to transfer the resistant gene to other varieties," he said.

The NuMex Nematador report was encouraging news to growers. Last year, New Mexico growers produced 5,500 tons of cayenne that had a value of \$2.2 million.

And growers believe that cayennes offer a market worth expanding. Most red, high-pungent hot sauces are made from cayennes.

Other new varieties the center has introduced recently are:

- NuMex Garnet, a low-pungent, intensely ruby-red pod paprika that yields a resin that is used for food coloring.

Paprika extract is used as a coloring agent from lipstick to meat cold cuts and wieners.

"This chile could be a big step forward for the industry," Louis Biad, founder of Biad Chili Co. north of Las Cruces.

Research with paprikas as a source of coloring agents picked up about two decades ago when a federal agency declared many food and cosmetic coloring agents as carcinogenic.

The NuMex Garnet plant disperses pod throughout the canopy evenly, which is an advantage for machine harvesting, Stephanie Walker, a NMSU research specialist, reported.

While NuMex Garnet has been officially released, growers will not be able to obtain seed for another two

years. Researchers are building a foundation seed supply for distribution through the New Mexico Crop Improvement Association.

- Criollo de Morales X, a non-pungent jalapeño.

- Suave, mild-flavored habanero.
- Jalmondo, a medium-pungent jalapeño.

For chile marketing ideas, Frieda Caplan, Frieda's Finest, Inc., Los Alamitos, Calif., explained how she successfully marketed habaneros, known as "... the hottest chile in the world."

She said that while trying to market chile, processors should remember that retailers want a product that can offer:

- Fast turn over, repeat sales, minimum spoilage and attractive packaging.

When she investigated the possibilities of marketing habaneros she heard of one man who tried to sell these pungent chiles in one-pound packages. The idea did not work in retailing.

"A pound of habaneros is enough to last a life time for many people," Caplan said.

She decided to sell habaneros in 3/4-ounce packages, and the idea caught on with consumers.

But she has an added another marketing touch, selling variety packages containing, for example, habaneros, serranos, Fresnos and Anaheims.

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