Bio-Control Popular in Chile Greenhouse

Biological control involves the use of living organisms to control other, undesirable, living organisms. A simple example of biological control is keeping a house cat around to control field mice. Approximately 50 years ago, *Encarsia formosa*, parasitic wasps, were used to control whiteflies, a common insect pest. *Phytoseiulus persimilis*, a predacious mite, was used to control the treacherous two-spotted spider mite. The use of biological controls declined with the advent of chemical pesticides. However, due to employee and consumer concerns about health risks and environmental contamination associated with chemical pesticides, there has been a recent resurgence in biological control. There currently are a large number of biological controls available for common greenhouse insect problems.

Jose Quiles, a horticulture student, has first-hand knowledge of biological control. Quiles is responsible for pest management at the research greenhouse for New Mexico State University’s chile-breeding program. He recalls being “a little apprehensive” when he was first assigned to the program. “I didn’t have much experience in pest control and the thought of handling concentrated pesticides did not appeal to me,” he said. Quiles attended a pesticide handling and safety training course where he learned that pesticides can be very safe when handled properly and intelligently. He also credits Eric Votava, research specialist, for understanding his concerns and giving him a notebook of biological control information.

Quiles’ first challenge was using biological controls in a greenhouse traditionally maintained using chemical controls. He had a lot to learn if he was going to instill an integrated pest management program that would incorporate biological and chemical control. The first thing he did was learn to become proactive. In the past, insects were controlled in a highly reactive manner. When pest populations increased, management reacted by using chemical sprays. “Our management process has now become proactive in the sense that our insect monitoring has increased greatly,” he said. “We now take action at the first sign of pests. I release predator insects as a preventative measure to help avoid infestations.”

“We want to make our greenhouse a place where ladybugs would like to stay and raise a family.”

After he learned which insects to use for biological control, he was finally able to get to the “fun part”—releasing predators. Quiles experimented with various insects to determine which types would work best in the greenhouse. His first bio-control effort focused on thrips. Thrips are small insects that feed on the pollen of chile flowers. “Thrips are the...”

Continued on page 2.
bane of breeding programs where pollen is used as a resource for breeding," he said. To control thrips, Quiles releases minute pirate bugs—large insects that have a long proboscis that pierces the thrips and literally sucks the life out of them. "After the pirate bugs do their job, predatory mites (Amblyseius cucumeris) are released on a regular basis to continue the process," he said.

Other common greenhouse pests include spider mites and aphids. Spider mites attach to the plants and cause yellowing and death of the leaves. "It was a slow process getting these pests under control, but I could not have done it without the help of Phytoseiulus persimilis," Quiles said. Persimilis, as they are commonly called, are small orange predatory mites which attach to the two-spotted spider mites causing slow death.

Aphid control is an ongoing process in greenhouse management. These pests can transmit the Alfalfa Mosaic Virus which leads to discoloration and reduced vigor in greenhouse foliage. "Traditionally, these pests have been treated in the field with an annual release of ladybugs. Recently, greenhouses have begun releasing them with good results. The next step is to keep them contained in the greenhouse. "We want to make our greenhouse a place where ladybugs would like to stay and raise a family," Quiles said. "Hopefully, the winter weather will make them want to stay indoors."

Quiles also is working on controlling greenhouse whitefly populations before they reach infestation levels. He recently introduced the Encarsia (Encarsia formosa), a parasitic wasp which feeds on the adult whitefly, and he hopes they can do the job.

Integrated pest management is a complicated process requiring considerable research and trial and error. The key is trying different control methods and finding pesticides which will work in a bio-control program without exterminating the predator population. Integrated pest management must be proactive to prevent pest outbreaks. Waiting for a large outbreak and then using a chemical spray will not get the job done. "You must try to stop the pests before they strike," Quiles said.

Meet the CPI Board (Part II)

Gene L. Jefferies is employed by McIlhenny Company as director of agricultural operations and has held that position for more than 20 years. He is responsible for the supervision of all pepper production for the company in the United States and seven countries in Latin America. This involves overseeing seed production at Avery Island, monitoring pepper quality, providing technical assistance at the overseas locations, and managing of pepper mash shipments to the United States. Jefferies grew up on a farm and cattle ranch in Arizona, is a graduate of Arizona State University, and received his master's degree in agricultural economics from the University of Arizona. Before moving to Louisiana, he lived in Brazil for five years and in Venezuela for seven years, working in agricultural research and

Javier Vargas is the agricultural agent and county program director for Doña Ana County's Cooperative Extension Service in New Mexico. He received both bachelor's and master's degrees from New Mexico State University. Vargas works extensively with the state's chile and pecan producers. He has served as an ambassador for the chile industry, helping develop the New Mexico Chile Conference which began 15 years ago and attracts a worldwide audience. Vargas has been the chair of the New Mexico state library commission for the past five years.

James Ferguson, an Iowa native, spent six years as an electrician for Naval Nuclear Submarine Service. He graduated from Iowa State University in 1980 with his bachelor's in bacteriology. After graduation, he began work with Pet Inc. in Bryan, Ohio, as a production supervisor at the evaporated milk plant. He moved to the Buhl, Idaho, evaporated milk plant in 1983 as plant superintendent and took over as manager in 1984. In 1988, he was transferred to manager at Pet's Greenville, Tenn., plant where corn products, refried beans, and evaporated milk are made. In 1989, he moved to Anthony, Texas, as plant manager. Pet Inc. became Pillsbury in 1995 and then Anthony Foods LLC in 1997. James is currently the vice president of manufacturing for the new company.

Editor's note: Part I of this article was published in the previous issue of the Chile Pepper Institute Newsletter.

Perfect Pico De Gallo

Combine all ingredients; chill. Will keep at least two weeks in refrigerator. Serve with meats, chicken, hamburger, etc. Yields: 1 cup.

Pico de gallo is served as a dip throughout the Southwest. Most restaurants have it waiting on the tables with warm tostadas.


Chile—More than a Food

There is more to chile than just flavoring dishes. The wonders of chile are many as highlighted in the article, "Chile Time," by Sharon Niederman, author of Hellish Relish: Sizzling Salsas and Devilish Dips from the Kitchens of New Mexico, and several other books on the history and culture of New Mexico. The author highlights fascinating points about chile and shares beliefs and uses for chile practiced around the world.

Notes of Interest

- Chile is believed to have originated some 10,000 years ago in the Amazon region of South America in the area of Brazil and Bolivia. Evidence of chile-eating as early 7000 B.C. has been found in the Tehucan Valley south of Mexico City. Chile has been cultivated for almost 7,000 years by ancestors of...
the Aztecs in Mexico, as well as by the Toltecs, Mayans, and Incas.

- The word “chile” is a Spanish spelling of chil, the Aztec, or Nahuatl, word for pepper. The word “capsicum” is either derived from the Latin capsicon meaning chest or box, or the Greek kapto meaning to bite. The chile pod could well be the world’s oldest and best-provisioned medicine chest.

- In addition to its distinction as one of the world’s favorite spices, chile also is one of the oldest.

Sixty percent of the nation’s chile crop is grown in New Mexico, the Land of Enchantment.

- Salsa is now the nation’s most popular condiment, surpassing even ketchup.

- Since 1980, chile consumption has doubled in the United States.

Health Notes

- Chile may protect against blood clots and prevent heart attacks, and it is known to hinder cholesterol absorption.

- Chile is not only low fat, it also is high in vitamins A and C and beta carotene.

- Chile speeds up the metabolism.

- It helps digestion by intensifying stomach acid production and sometimes working as a laxative.

- Chile is used as a pain reliever to alleviate arthritis. New Mexico old timers chop up chile and place it on the aching limb. More recently, people buy tubes of capsaicin topical cream from their pharmacies.

- Products derived from chile bring relief from other kinds of chronic pain, such as that caused by cluster headaches, shingles, herpes, amputation, and other surgery.

Beliefs/Uses of Chile

- In Mexico’s Copper Canyon, the Tarahumara consider chile to be the greatest protection against evil sorcery. Many native people still believe chile is a gift of the gods, and they eat it to prevent illness.

- On Mexico’s west coast, the Cora Indians believed the first man, Narama, was the patron of salt, mescal, and chile.

- The indigenous people of Panama tie a string of chile to their boats to repel sharks.

- The Mayans, aware of chile’s power as a decongestant, used chile to medicate asthma, coughs, sore throats, and respiratory disorders.

- Indigenous people also were aware of chile’s potency in cardiovascular and digestive disorders.

- In Hawaii, chile is used to soothe backaches and swollen feet.

- In central Africa, chile is valued as a sedative.

Chile is a versatile commodity welcomed around the world. Niederman writes, “Not only is chile a great native cuisine of the United States, it also addresses our sense of fun, adventure, and roots.”


To order back issues of the Chile Pepper Institute Newsletter, contact The Chile Pepper Institute, NMSU, Box 30003, Dept. 3Q, Las Cruces, NM 88003.
Omnicolor Provides a Rainbow of Taste

The Chile Pepper Institute's 1998 exotic chile seed sample is a C. baccatum, Omnicolor, from Peru. The name "Omnicolor" describes the many colors the fruits turn as they ripen on the plant. Omnicolor is similar to the Aji Ayucllo (described in the last CPI newsletter) with the exception of its fruit shape. Omnicolor has elongated, pointed fruits, approximately 2.5 to 3 inches long, and 1/4 to 1/2 inch wide. The fruits begin as a lovely lilac purple then gradually change color from yellow to light orange to dark orange to red-orange, and then finally to a bright red. Not only is the plant beautiful, but it also is quite productive, averaging more than 70 fruits per plant. When harvested in the purple or yellow stage, the fruits have a wonderful pickled taste. The fruits are moderately hot, about the same heat as Aji Amarillo or Serranito.

Look for your Omnicolor sample in this newsletter.

Omnicolor (C. baccatum)

The Chile Chronicles: New Mexico's Harvest

Carmella Padilla has teamed up with photographer Jack Parsons to produce the definitive book on New Mexico chile—The Chile Chronicles. Padilla spent three years researching facts and myths, and in the process uncovered many fascinating tidbits about New Mexico chile. While she was conducting her research, Parsons was photographing anything and everything that had to do with chiles. His efforts provide some of the most dramatic and vivid photos available of growing and harvesting chile and its culture. Padilla says she became interested in chiles when she was a young girl and would hear her grandparents lament and rejoice the production of chile. In the book, Padilla wrote about the Hispanic culture of northern New Mexico and the influence of chile. She also wrote about the southern New Mexico chile-production area that supplies a nation with its daily demand for chile.

The book traces chile from its South American origins to its development as an agricultural mainstay in New Mexico. Chapters include "A History of New Mexico Chile," "Chile Science," "The Chile Landscape: North and South," "Seasons in the Chile Cycle of Life," "The Future of Chile," and "Hatch, New Mexico: Chile Town, USA" Although the chapters expound the pungency, taste, texture, and color of chile, the essence of these chapters is that chile also is about a culture.

"The Chile Chronicles brings to life the chile culture of New Mexico...a must-read for chile lovers."

said Mark Miller, owner and chef of Coyote Cafe in Santa Fe, N.M. "This is one of the best books on chile that I have ever read—a must-read for chile lovers."

The Chile Chronicles is published by Museum of New Mexico Press, P.O. Box 2087, Santa Fe, NM 87504. The ISBN is 0-89013-313-1.
Hot Stuff Spells Pain Relief

Capsaicin, the agent that makes chili peppers hot, may soon spell pain relief for millions of people. Both extreme heat and capsaicin, the agent that puts the hot in hot peppers, trigger pain-sensing nerves by activating a cell surface protein, or receptor, that allows calcium ions to rush into the cells, reported David Julius of the University of California-San Francisco and his colleagues in the October 23 issue of *Nature*. "If you put capsaicin on your skin, you'll feel a tingling and a burning," Julius said.

To identify receptors that recognize capsaicin's presence and trigger the burning feeling, researchers isolated genes active in sensory nerve cells that connect to the spinal cord. They added small groups of the genes to non-neuronal cells, observing which ones then took in calcium when exposed to capsaicin. Eventually, the investigators closed in on one gene that made the cells sensitive to the spicy compound. The gene encodes a kind of protein called an ion channel, and capsaicin isn't the only thing that will open it. Increasing cell temperature from 22°C to 45°C also activates the receptor, Julius' group discovered.

Capsaicin interests physicians because, paradoxically, prolonged exposure can relieve pain (*Science News*: 11/14/92, p.333). Scientists remain uncertain whether this analgesic action results because pain nerves gradually become less sensitive or because an overabundance of calcium ions kills them.

According to Science News, if researchers are able to identify capsaicin's receptors, they may be able to develop an improved analgesic that will inhibit or destroy pain sensory nerves. "What would be ideal is, instead of activating this receptor (as capsaicin does), to block it painlessly," said Davie E. Clapham of Harvard Medical School in Boston.


Bell Pepper Consumption Increases

Eating habits are improving as the baby boomers enter their 50's and are seeking a better diet. "People are more health conscious and more nutritionally astute," said Gary Lucier, a USDA economist. "They are concerned about diet, health, and good eating, and are looking for new items and new flavors."

The bell pepper may be one way to satisfy their tastes. This may explain the 67-percent increase in bell pepper consumption during the last decade, reported by the U.S. Department of Agriculture's Economics Research Service. "Bell pepper consumption will continue to increase due to America's growing taste for pizza, pasta, and salsa, Lucier said.

Source: *The Packer, November 3, 1997.*

Genetic Engineered Produce: Coming Soon

Look for genetic engineered produce at your local grocers in the near future. "Although supermarket shelves are void of many bio-engineered fruits and vegetables, that could change within the next year," said Tom Burfield, Western Correspondent for *The Packer*. "Annual crops like tomatoes, potatoes, peppers, cucumbers, or squash are the most likely targets for genetic engineering, biotechnology experts say, because they go from seed to harvest in one season."

"Because genetic engineering is expensive, the growth cycle of the plant and the volume of the commodity are major factors in determining which commodities are candidates for the process," said Dave Evans, vice president of business development at DNA Plan Technology Inc., Oakland, California.
In the future, DNAP expects to release improved-shelf-life red and yellow peppers. “Particularly the yellow peppers tend to shrivel up and rot after they’ve been in the supermarket for a time,” Evans said. “We’re looking at controlling some of the genes that cause this softening.” DNAP’s emphasis has been concentrated in disease resistance so growers can become less dependent on pesticides.

AgriTope Inc., of Beaverton, Oregon, is making progress in controlled-ripening programs involving several commodities, said Matt Kremer, vice president of the company’s product development. AgriTope is not offering genetically altered produce at this time, but Kremer expects at least limited volume by 1998. Although the thrust of the company’s program is to lower costs and eliminate waste for the producer, retailers and consumers also may benefit from lower costs, higher quality, and less perishable produce.


Publications Available from the Institute

1992 Producer Survey of Foliar Chile Pepper Diseases in New Mexico, booklet $4 postpaid.
The Pepper Weevil and its Management, booklet, $2 postpaid.
Available soon at the Chile Pepper Institute:
The Pepper Garden, by Dave DeWitt and Paul W. Bosland.
This volume is the most comprehensive handbook on the market today about identifying Capsicum species.

Back issues of the Chile Pepper Institute Newsletter are available for $5.00 each.

Other publications are also available, please write for details. Publications can be ordered from: The Chile Pepper Institute, NMSU, Box 30003, Dept. 3Q, Las Cruces, NM 88003. (Please make checks payable to: NMSU Foundation/Chile Pepper Institute.)

Bell Peppers Take a Cruise

Fleetwide weekly consumption of fresh produce items on Carnival Cruise Lines’ 10 Fun Ships includes 13,300 bell peppers.

Source: Carnival Cruise Lines

Renew Your Membership or Join the Institute!

Members receive a one-year subscription to our quarterly newsletter, our Chile Pepper Institute decal, seed packets of new varieties, and other chile items. Members, please note that the expiration date of your membership appears on the mailing label.

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Yes, please send a sample newsletter to my chile-loving friend:

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