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SMALL FRUIT NEWSLETTER

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Cyclospora:Dealing with Customer Concerns

Many strawberry growers have recently found themselves faced with questions regarding health problems blamed on strawberries infected with the parasite cyclospora. Reports of this problem have appeared in the news media during the last week and some sources have advised against eating fresh strawberries. How should you answer these questions? Honestly and openly is the best approach, and will build customer trust. Please find printed below a recent press release regarding cyclospora which details what scientists know about this parasite. Share this information with your customers if they ask questions about the problem. It is important to note that the investigation into the problem is still ongoing, and neither strawberries nor cyclospora have been positively confirmed as the cause of the illnesses observed in all of the reports. An expert on cyclospora has stated that it is not possible for the parasite to be taken up by a plant through the soil. So far all incidences of the problem have been associated with large gatherings such as dinners or family functions. There is still debate as to whether the organism is coming from the field or from the food storage and preparation facilities. Finally, there have been no cases reported of this illness from berries picked in New England.

Cyclospora: A Recently Discovered Parasite

Dr. Charles Sterling, Department of Veterinary Science, University of Arizona

Overview: Public health officials are seeking the cause of a recent outbreak of Cyclospora cayetamensis, a protozoan parasite. The microbe can cause cramping, abdominal pain, severe diarrhea, nausea, fever and extreme fatigue; it is treatable with antibiotics sold as Bactrim or Septra, and is generally not fatal. A number of fresh fruits and vegetables have been suggested as a carrier, but, at this point, there is no compelling evidence and no common thread that can point to any cause.

What is Cyclospora? Cyclospora, once thought to be linked to blue-green algae, has been identified as a new protozoan parasite and is a relative of Cryptosporidium. Whereas Cryptosporidium can be transmitted from one infected human to another human, Cyclospora requires a period of time to work into the environment and must be ingested. Based on our research, we are certain humans are most likely infected through ingestion of water containing the infectious stage of the parasite, commonly called the oocyst stage. Once acquired, it takes from four days to a week before signs of infection are noted. The infection may last anywhere from one to four weeks. People who are immune compromised are at greater risk, and therapeutic intervention is required. Strong evidence indicates that humans are the only likely host of Cyclospora.

Epidemiology of Cyclospora. After 20 years of research, we are starting to define the epidemiological link of Cyclospora to water. In Nepal, the organism was actually detected in water.

Cyclospora passes from an infected individual in unsporulated (immature) state and requires one to two weeks time under ideal conditions to become infectious. Ideal conditions which lead to Cyclospora becoming infectious include exposure to moisture and temperatures of at least 25 degrees C, (77 to 89 degrees F). A

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moist environment is necessary for the organism to sporulate, and become infectious.

Identifying Cyclospora. Cyclospora is an extremely difficult organism to identify, which may account for some of the problems in pinpointing a cause of the illnesses recently observed. Without confirmation, it is difficult to be sure that we are, in fact, confronting a Cyclospora outbreak in all instances. The most important element in the identification is an infectious stage. One must look at the internal structure of the oocyst after it sporulates, and only then can one be 100 percent certain that the organism is Cyclospora. If it turns out that some of the outbreaks have been caused by another parasite, the ability to determine the source of the contamination will be severely compromised.

Can Cyclospora be spread by food? It is highly unlikely that fruits or vegetables could be the primary source of infection in terms of growing or shipping practices. They would literally have to be grown in human fecal waste and exposed to direct surface contact. It is also unlikely that the organism can be transmitted from infected food handlers because if their hands were contaminated with feces, the organisms would still be in an unsporulated and immature stage. Cyclospora would still need up to two weeks to become infectious.

Virtually every past outbreak has occurred near water, whether it was a lake, a reservoir tank on the top of a building or a cellar contaminated with sewer water. At this point in the investigation, of the current outbreaks it is premature to hypothesize about any specific food as a possible carrier of the parasite. In fact, such speculation could compromise ongoing investigation.

Dr. Sterling and his colleague, Dr. Ortega are credited with identifying the Cyclospora parasite and determining its maturation process. His team is recognized as among the foremost authorities on the parasite.

Alfalfa leafcutter bees to pollinate highbush blueberries in Maine.

by Ellen Mallory

The summer, Carl Estes, Kevin Ham and Dan Wedge will have the help of twenty-thousand alfalfa leafcutter bees to produce their blueberry crops. These highbush blueberry growers are collaborating with Dr. Connie Stubbs and Dr. Frank Drummond and Ellen Mallory, from the University of Maine at Orono, on a project looking at how well the leafcutter bees pollinate and reproduce on highbush blueberries. The performance of the leafcutters will be compared to that of honey bees which are being used on the Rivard and Colburn blueberry farms.

Alfalfa leafcutter bees are about half the size of honey bees and are a solitary species; unlike the honey bee, they do not organize to form a colony. However, they are gregarious and the females tend to nest closely together. The leafcutter's name comes from the fact that the females cut small pieces of leaves, from the crop of wild plants, to make little thimble-shaped cells inside holes in wood (or in nesting blocks provided by a beekeeper). They provision the cells with nectar and pollen, lay one egg in the cell, cap it with more leaf pieces and then start on the next cell, laying up to 7 cells end to end. One female can complete 12-16 cells in her lifetime. It is during this nesting process that the female bee pollinates the crop, moving pollen from one flower to another as she collects pollen and nectar to provision the leaf cells.

The leafcutters overwinter as larvae in these leaf cells. However, in Maine and other northern states, the winters are too extreme for the alfalfa leafcutters to overwinter naturally. Instead, a beekeeper can collect the leaf cells in the fall, place them in a moderately cold area of a barn or garage, and then heat them up the

following spring to bring about the pupation and emergence of adult leafcutters.

The alfalfa leafcutter bee is used extensively for pollination of seed alfalfa in the western U.S. and Canada. Because of its size, the leafcutter is well suited to collecting pollen and nectar from the small alfalfa flowers. Alfalfa seed producers either manage the bees year-to-year themselves, or order them from a number of suppliers who are located in the western states and Canada. Leafcutter bees have a number of characteristics that make them easy to manage.

*Their emergence can be controlled to coincide with crop bloom.
*They forage close to home and are therefore more faithful to the blooming crop than honey or bumble bees which can travel great distances to forage.
*They will use human-made nesting sites, nesting close to one another. This makes servicing and moving the bees easy.
*They are not aggressive and can be handled without any protective clothing.

In Maine, work with alfalfa leafcutter bees began in 1992 when Drs. Stubbs and Drummond recognized a growing concern that Maine fruit growers rely almost exclusively on one species of bee, the honey bee, for the pollination of their crops. This may not be sustainable since the availability and cost of honey bees has become uncertain due to increasing problems with disease, parasites and Africanization.

The researchers' first work with the alfalfa leafcutter bees was in lowbush blueberries and yielded promising results: the leafcutters collected lowbush blueberry pollen and significantly increased the fruit set of the crop. Similar results have been found in Nova Scotia. In fact, a number of lowbush blueberrry growers in Eastern Canada are currently using leafcutters because of the low availability of honey bees in their areas. There are even two custom pollinators who rent out leafcutters, just as honey bees are rented, to lowbush growers in Nova Scotia and New Brunswick.

Encouraged by the results in lowbush blueberries, Stubbs and Drummond decided to introduce leafcutters to other small fruit crops in Maine. Last year they began working with the highbush blueberry growers mentioned above, as well as Washington county cranberry growers to see how well the leafcutters reproduce on alfalfa grown for seed. This research is supported by a grant from the United States Department of Agriculture's Sustainable Agriculture Research and Education Program.

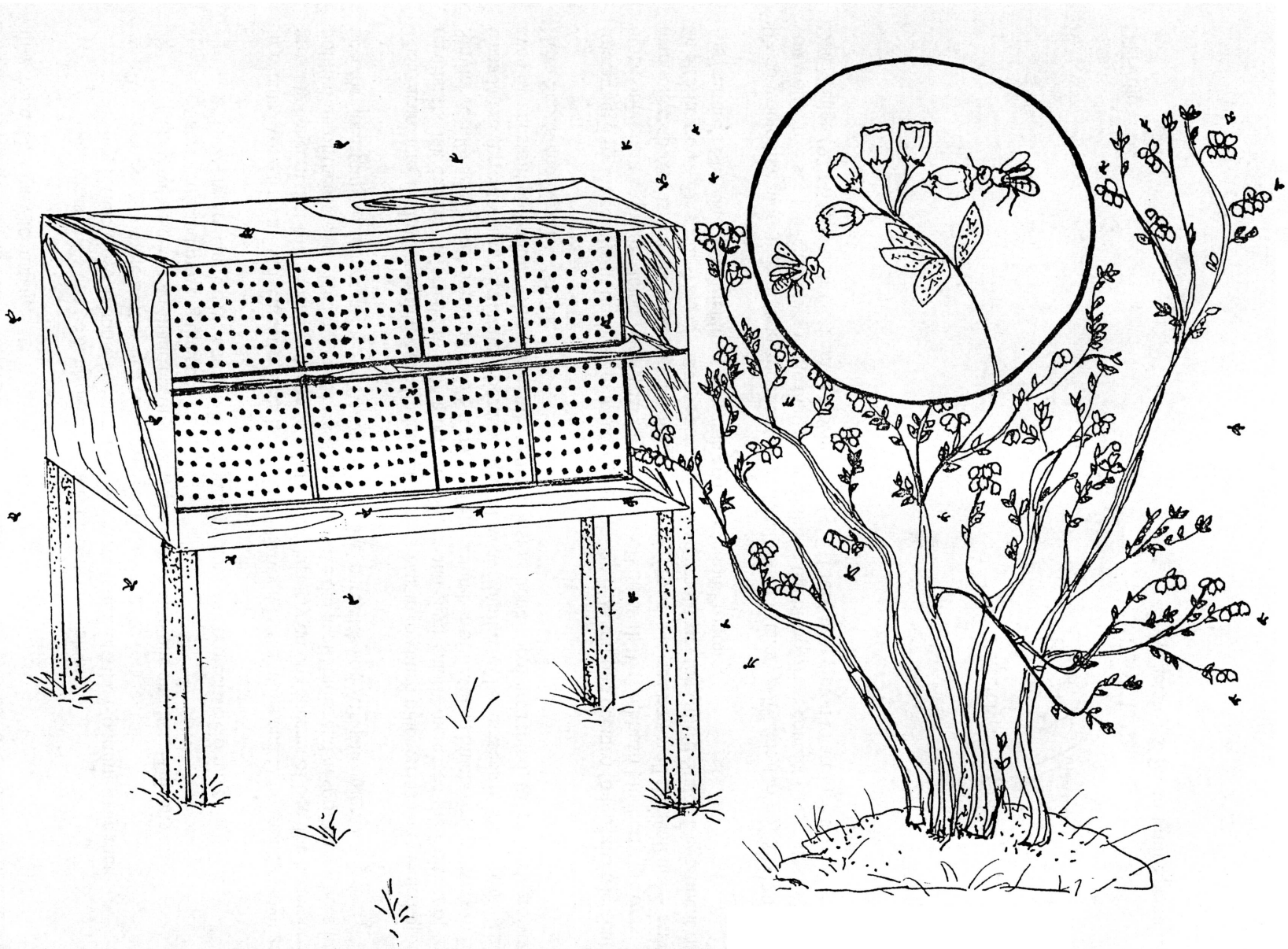
If you would like more information about the project, call Ellen Mallory, UMaine-Orono (581-2961). And if you would like see the leafcutters while they are working in the blueberries, contact Carl Estes (929-4801) or Dan Wedge (929-5194) near Gorham or Kevin Ham (457-1200) near Acton to arrange a visit.

Sincerely,

David T. Handley

DTH/djp

David T. Handley
Vegetable & Small Fruit Specialist



Caption for sketch: Alfalfa leafcutter bees pollinate highbush blueberries while collecting pollen and nectar from the flowers. They nest in shelters provided for them in the field. (sketch by Kirsten Hill)