

A Bacterial Disease of Chrysanthemum (and Geranium!)

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When an easily-spread disease agent can disfigure leaves on two of our major crops, it is time to sit up and take notice. *Pseudomonas cichorii*, a bacterium causing large leaf spots and bud rot on chrysanthemum, has now been found to be a serious disease on geraniums in Florida. This new bacterial problem is an additional frustration to the grower who is already on the lookout for the notorious geranium pathogen, *Xanthomonas pelargonii*, the agent of bacterial wilt. As yet, *Pseudomonas cichorii* has not been seen to affect geraniums in New York. We know that the organism has been introduced to N.Y. greenhouses on infected chrysanthemums, however, so the appearance of symptoms on geranium is probably just a matter of time.

When the *Pseudomonas* bacterial spot symptoms (described below) are detected on geraniums, growers should treat this disease with the same respect they have previously shown for the *Xanthomonas* blight. The leaf spot *Pseudomonas* has the potential to be as hard to eliminate as *Xanthomonas pelargonii* has shown itself to be in the past. Fortunately, the new disease is not a systemic infection. As with any bacterial disease, however, options for control are severely limited by our lack of effective chemicals. Antibiotics have shown little promise for the control of *Pseudomonas cichorii*, and the copper sprays which may retard bacterial spread tend to injure the plants.

Since we are reduced to pop-gun weaponry in a tank-scale war against *Pseudomonas cichorii* leaf spots, it becomes necessary to rely on strategy. The strategy, in this case, it to be aware of the possibility of bacterial infection, and to design the greenhouse program so as to thwart disease. Bacteria are primarily spread from plant to plant by splashing water, and lesions enlarge readily on a wet leaf surface. Thus every effort to keep leaves dry is a countermeasure against disease: some of the opportunities to apply this knowledge are in the choice of plant spacing, ventilation and watering practices.

Quick detection of symptoms as they appear on your plants can also keep you ahead of the disease. A few unhealthy plants promptly eliminated might spare the rest of the crop. If the disease is introduced on cuttings, it may be limited to one variety, or to one box of a shipment.

Dealing with *Pseudomonas cichorii* is, in one sense, trickier than handling its fellow bacterium, *Xanthomonas pelargonii*. Whereas the bacterial wilt-causing *Xanthomonas* is highly specific to geranium, the *Pseudomonas* now assailing chrysanthemum and geranium crops has a much more varied diet. *Pseudomonas cichorii* was first noted as a pathogen of vegetable crops; it is known to infect cabbage, cauliflower, broccoli and endive, as well as philodendron, Swedish ivy, aglaonema, scindapsus and

monstera among foliage plants, and gerbera and larkspur among flowering crops. The most important aspect of this host range is the potential for spread between geraniums and mums, or from a diseased foliage plant to one of these major flowering crops. It will be extremely important to avoid following a bacterial spot-diseased geranium crop with chrysanthemums. Thorough sanitization of surfaces with 10% chlorox solution is essential after bacterial contamination of a crop. Be aware of the possibility that a *Pseudomonas cichorii* leaf spot on a foliage plant could spread infection to your Thanksgiving mums or your Mother's Day geraniums.

***Pseudomonas cichorii* on chrysanthemum**

The symptoms of infection on mum are fairly large, irregular brown areas on the leaves (sometimes extending down the petiole into the stem). Flower buds may also
(continued on page 2)



"Yellow Mandalay" chrysanthemum with leaves and buds of branch in foreground severely blighted by *Pseudomonas cichorii*.

Bacterial Disease (continued)

turn brown, and the flower stem may decay for an inch or more beneath the ruined bud. The disease reaches epidemic levels only when plants are grown pot-to-pot and watered from overhead. In a less humid environment, leaf infections will do much less spreading. The spots look blackish when wet, and may show concentric zones at the center of the lesion. This disease was seen to cause meaningful losses at several Long Island locations in the fall of 1979.

Pseudomonas cichorii on geranium

How can this bacterial disease be told apart from the bacterial spot phase of *Xanthomonas pelargonii* infection? First of all, *Pseudomonas cichorii* causes only leaf spots and flower bud infections, whereas systemic infection by *Xanthomonas pelargonii* will result in black discoloration of stem, both internally and externally. Secondly, the leaf spot phases of the two diseases are different in appearance: the *Xanthomonas* produces small, rounded leaf spots (2-3 mm diam) while the *Pseudomonas* produces spots which are larger (1-2 cm diam), irregular in outline, and fast-spreading under moist conditions. You may never have seen these symptoms on a geranium, but as the infections of chrysanthemum and foliage plants are becoming more common, the likelihood of transmission to geranium is increasing as well.

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The President's Reflections!

by Wes Coddington



Many members may feel that our organization seems distant and impersonal. You pay your dues, receive the bulletin and perhaps attend the convention once in a while. But there's nothing you can contribute; the Board takes care of all of the responsibilities, so why get involved?

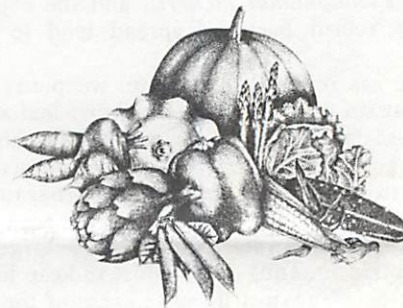
It is true, the Board makes decisions; they are our policy makers. But like any form of government, our Board can only be as effective as the input they receive from the members.

At our annual meeting, I could not help but reflect that each of you are great people, successful in your own businesses and solid citizens in your own communities. I also thought, "what a vast amount of talent must be hidden within our members from one end of the state to the other."

Accomplishments come from an interchange of expressions. You may feel that some of the Board's actions are out in left field, or you may have a new idea that you would like to have NYSFI try. Whatever it is, let us know either by mail or call a Director located near to you.

We now have a purpose as an organization for which to work; with our participation in the CAO, creating a closer communication with our two and four year schools, and finally the creation of the Education and Research Fund.

We would appreciate it if you would take three minutes of your time to fill in the questionnaire found in this bulletin.



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