DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
University of Arkansas System
Sherrie Smith

SPDN
Southern Plant Diagnostic Network
Issue 1-February 27, 2013

Arkansas Plant Health Clinic Newsletter

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Phytoplasmas

Phytoplasmas are specialized bacteria that invade plant phloem tissue and cause disease. Sap-sucking insects transmit phytoplasma from plant to plant. Four families of planthoppers and two genera of psyllids as well as leafhoppers are known to be vectors of phytoplasmas. The bacteria enter the insect's body through the stylet when feeding on an infected plant. From there, they move through the intestine and eventually colonize the salivary glands. When the insect feeds on an uninfected plant, the bacterium is transmitted to the plant. Phytoplasmas may also be transmitted by parasitic plants such as field dodder. Symptoms include leaf yellowing, smaller than normal leaves, stunting, witches' broom, dieback, poor root growth, and sometimes plant death. A very common symptom is phyllody, the production of leaf-like structures in place of flowers. Many types of plants are susceptible to phytoplasma diseases, including weeds, ornamentals, fruit crops, and vegetables crops. Asters, cannas, chrysanthemums, coneflowers, cosmos, dandelion, delphiniums, gladiolus, marigolds, phlox, veronica, zinnia, anise, broccoli, cabbage, carrot, cauliflower, celeriac, celery, chicory, coconuts, dill, endive, escarole, flax, lettuce, white mustard, onion, parsley, parsnip, peaches, potato, pumpkin, radish, salsify, shallot, spinach, New Zealand spinach, squash, strawberries, sugarcane, and tomato are all susceptible. There is no cure for plants with phytoplasma infection. Plants with symptoms should be destroyed. Good weed control and the use of insecticides where warranted help control the insect vectors.

Strawberry Phyllody-*Candidatus* Phytoplasma

Photo by Randy Arnold, Arkansas Grower

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Coneflower Phyllody-*Candidatus* Phytoplasma asteris

Photo by Isaiah Smith

Tomato and Pepper

Spring is just around the corner. Growers should already have submitted soil samples to the sol lab to check the pH and the nutritional profile of their gardens. The service is free in Arkansas. Eager home gardeners are ordering seed, and many are already at their local nurseries looking for vegetable starts. Some of the problems we see every year can be avoided by planting at the proper time. Tomato and pepper crops require warm soil temperatures to grow properly, flower, and set fruit. Both tomatoes and peppers prefer soil that has a pH of 5.5-6.8 and is fertile, deep, and well drained. They need at least 6 hours of direct sun a day. Growers can get off on the wrong foot in the spring by planting when soil and air temperatures are too cold. Low temperatures can of course kill your plants. However, temperatures may not be low enough to kill the plant but low enough to injure the bloom, causing deformed fruit, commonly known as catfaced fruit. Another common problem is the practice of planting solanaceous crops such as eggplant, pepper, potato, and tomato in the same spot in the garden each year. This can lead to a build-up of disease-causing organisms. Crop rotation can be practiced in even a small garden plot.

Divide the garden into three sections:

1. Nightshade group: eggplant, peppers, potato, tomato.
2. Mustard group: cabbage, Chinese cabbage, cauliflower, bok choy, broccoli, sprouting broccoli, Brussels sprout, collards, horseradish, kale, kohlrabi, mustard greens, radish, rutabaga, turnip.
3. Everything else: beans, corn, cucumbers, melons, pumpkin, squash, etc.

Practice at least a three-year rotation between groups.

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Tomato Catfacing-Abiotic

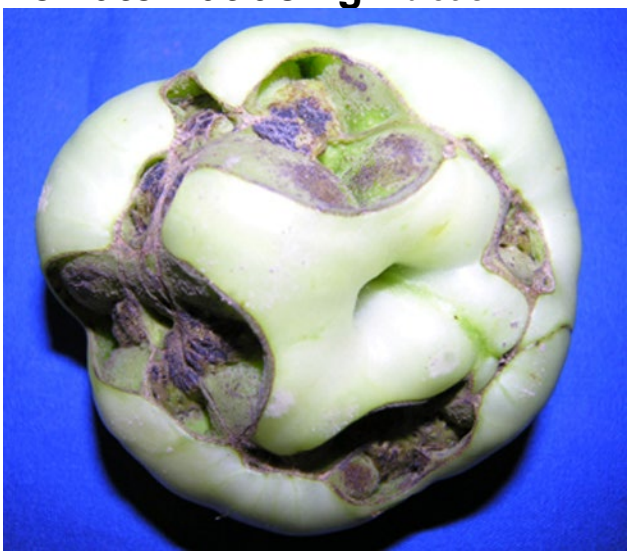

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

Pepper Catfacing-Abiotic

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

Lettuce

Bacterial Soft Rot

Soft Rot of lettuce, caused by the bacterium *Pectobacterium carotovorum* subsp. *carotovorum* (formerly *Erwinia carotovora* subsp. *carotovora*), can cause heavy losses both in the field and at market. Soft Rot in the field begins as rapid wilting of the outer wrapper leaves. Vascular tissues develop a pinkish to brown discoloration. The pith of the stem becomes water-soaked, macerated, greenish, and gelatin-like. Eventually, the entire head becomes slimy and collapses. The pathogen usually gains access to the plant through wounds or stomates. Warm conditions and very moist to saturated soils are conducive to a rapid increase of Soft Rot Disease. These same conditions are also favorable for pythium root and crown rot, which is sometimes found along with Soft Rot in the same field. Cultural controls are extremely important in controlling Soft Rot. These include crop rotation, good soil drainage, avoidance of overhead irrigation, and proper fertilization to produce vigorous crops. Copper fungicides has been helpful if applied early, before extensive disease development. Control of pythium consists of providing good drainage and the use of fungicides such as Ridomil SL.

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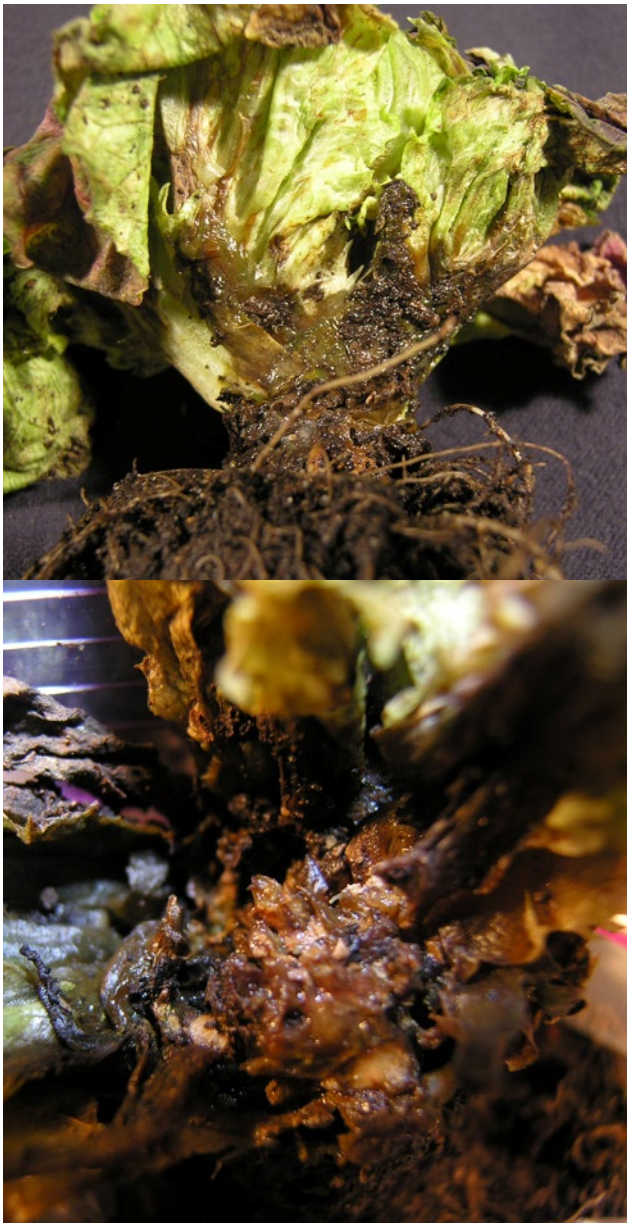
Lettuce Bacterial Crown Rot-*Pectobacterium carotovorum subsp. carotovorum*



Photos by Sherrie Smith, University of Arkansas Cooperative Extension

Downy Mildew

Lettuce Downy Mildew, caused by the fungus *Bremia lactucae,* is found wherever lettuce is grown when conditions favor the disease. At least 5 hours of leaf wetness coupled with cool temperatures is necessary for infection. Conidia (spores) of the fungus can be blown for hundreds of miles to infect susceptible crops. Inoculum may also reside on overwintering volunteer plants. Once initial infection occurs, secondary rounds of sporulation and infection occur if cool, moist conditions persist. Symptoms begin as small yellow spots on the upper leaf surface. A white-cottony growth appears on the corresponding tissue on the underside of the leaf. Lesions eventually turn brown as the leaf tissue dies. Although Downy Mildew attacks older leaves first, it spreads to newer tissue and can become a systemic infection, causing streaking in the vascular system of the plant and browning. The best defense against Downy Mildew is the use of resistant cultivars.

Lettuce Downy Mildew-*Bremia lactucae*

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

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Lettuce Downy Mildew sporulation-*Bremia lactucae*

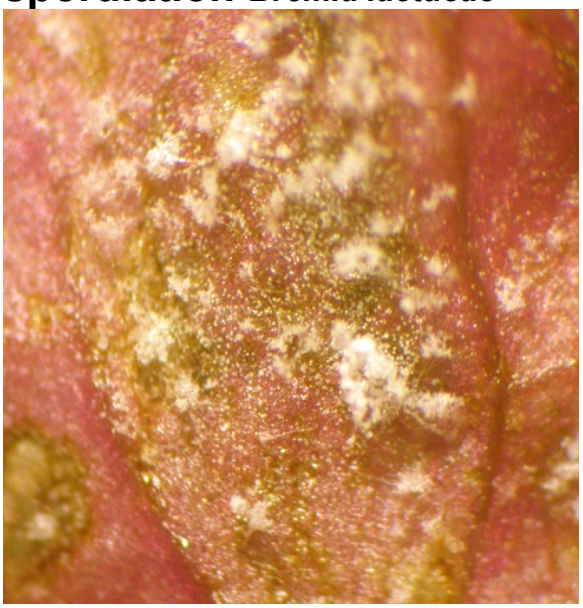

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

Lettuce Downy Mildew conidiophores and conidia-*Bremia lactucae*

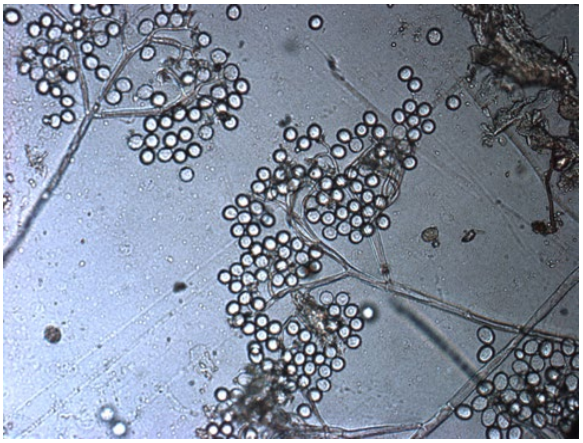

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

This bulletin from the Cooperative Extension Plant Health Clinic (Plant Disease Clinic) is an electronic update about diseases and other problems observed in our lab each month. Input from everybody interested in plants is welcome and appreciated.

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