

## PHYTOPHTHORA WATCH IN PEPPERS AND VINE CROPS... AND OTHER DISEASES OF VINE CROPS

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Conditions have been favorable for *Phytophthora capsici* and growers should be on the alert and checking their fields regularly –especially fields with a history of this disease. Look for soft rotted tissue anywhere on the plant, particularly the stem and crown near the soil surface or any fruit. Search low-lying areas of the field first. Recognizing disease due to *Phytophthora capsici* is not always easy; often the only visible symptom of infection, especially for cucumber or tomato plants, is stunting. Because the disease often occurs in low areas of a field where water accumulates, many growers assume that the stunting is due to ‘water logging’ of the roots. Squash or pepper plants may have more obvious symptoms, with plants permanently wilted or collapsed prior to dying. Infected plants often have brown to black discolored roots and crowns. Disease is most obvious on infected fruit, initially as dark, water-soaked lesions which may develop a distinctive white ‘powdered sugar’ layer of spores on the surface of the fruit. Fruit infection is especially troublesome because the infection may occur days before the symptoms become visible. Use the Disease Diagnostic Lab (413-545-1045) to confirm any suspected outbreaks. Two diseases which can be confused with *Phytophthora* fruit rot are *Pythium* fruit rot, which is characterized by white fluffy growth like fine cotton, and *Sclerotinia* white mold, which has dense cottony growth with black, hard, pea-like structures imbedded in it.

**Spread can occur** with moving water in the soil, on any soil left on equipment used for tillage or harvest, or with windblown spores moving through the air. *Phytophthora capsici* grows best at 80°F, and can rapidly spread throughout a field under warm, wet conditions. The fungus produces lemon-shaped spores called sporangia on the surface of roots, crowns, and fruit of infected plants. Sporangia may be dislodged from infected plants by irrigation water, drainage water, or windblown rain. In water, sporangia release many smaller swimming spores called zoospores. Swimming zoospores are attracted by root exudates from host crops. One zoospore is all that is needed to infect a plant. Sporangia may also directly germinate and cause infection. Disease occurrence within fields often follows drainage patterns, but windblown rain may allow *Phytophthora* to spread across an entire field.

### **Production practices that can help prevent outbreaks:**

**Minimize puddling**, whether from irrigation (fix leaks in irrigation systems!) or rainfall. Subsoil, clear pathways for drainage at the end of rows, etc. **Irrigate conservatively**, especially as fruit load increases in the field. If an outbreak occurs, plow under the infected patch including healthy plants that border the diseased areas. **Remove diseased fruit from the field**, but never dump culls or disease fruit from other fields or farms into production fields. If *Phytophthora capsicii* is introduced, it may remain indefinitely. **Clean equipment** that has been used in an infected field by washing with a strong water stream or power washer. Fungicides have provided minimal control in efficacy trials in New York State and elsewhere in

the US in vine crops and should not be used alone without cultural practices. In pepper or cucumber, directed sprays of mefenoxam (Ridomil), copper or chlorothalonil may be useful as a preventative program.

**Angular leaf spot** is showing up in some fields. The symptoms of this bacterial disease are leaf spots (round at first, growing until they are limited by the leaf veins and become angular spots). Initially they look water-soaked or brown, then the tissue becomes translucent and dead, or may fall out as the leaf ages or grows. This disease attacks cucumbers, squash, and watermelon. Warm, humid conditions are favorable for this disease. Generally, this disease has not significantly affected yields in New England. If you think you have a significant amount of angular leaf spot, or it appears to be spreading, then copper applications may be warranted. It is not certain that copper applications are effective in preventing spread of the disease. If you do apply copper, use a boom sprayer. Do NOT use an airblast sprayer, which spreads the bacteria throughout the field. When using copper products -- especially with young vine crops -- avoid higher than label rates and wait for cooler temperatures if possible, as high rates at high temperatures have some risk of phytotoxicity. One caution is that symptoms of bacterial leaf spot of cucurbits (*Xanthomonas campestris* pv *cucurbitae*) are very similar but can result in fruit rot, while angular leaf spot does not. Consult the Disease Diagnostic Lab for assistance in diagnosis.

**Belly rot**, caused by *Rhizoctonia solani*, has been reported in cucumbers. This begins on the underside of the fruit, where fruit is in direct contact with infected soil. It is most common in cucumbers but can infect other cucurbits. Water-soaked, tan- to brown lesions become sunken and cratered as they enlarge. Temperature is more critical than moisture for disease development, although high humidity under a thick foliage promotes disease. The optimum temperature is 81°F. Mulch or other barrier between soil and fruit reduces disease.

**Powdery mildew** is being found in butternut and pumpkin fields, often still at rather low levels. However, we recommend that the first symptoms seen trigger a regular spray program (see July 24 issue for details).

--R. Hazzard, adapted from M. Hausbeck (*Michigan State*), R. Wick (*UMass*), M. McGrath (*Cornell University*)