

A3834

Vine crops disease: Phytophthora blight

KAREN DELAHAUT and WALT STEVENSON

Phytophthora blight is a highly destructive fungal disease of all vine crops. The disease has been present for decades, but the frequency of epidemic outbreaks is increasing. The first major outbreak in Wisconsin occurred on cucumbers in 1995. *Phytophthora capsici* is capable of causing complete destruction of zucchini, pumpkin, summer squash, and watermelon fields. The fungus is also capable of causing serious damage in cucumber, muskmelon, tomato, pepper, eggplant, and snap and lima beans. Long-season crops appear to be more severely affected by this disease.



The flesh of diseased cucumber fruit (left) turns yellowish tan and becomes soft. Healthy cucumber is on right.

Symptoms and effects

The most devastating form of Phytophthora blight is root and crown rot. It starts as small, brown lesions on the lateral roots and tap-roots. Infected plants soon begin to show signs of stress and the crown becomes chlorotic. As the disease spreads outward from the crown along the runners, the crown begins to die. Plants may wilt during mid-day and recover in the evening—symptoms similar to those caused by bacterial wilt and squash vine borer larvae. Infected plants may die 2–4 days after the wilting begins.

When the infection site occurs on the leaves, it creates chlorotic spots that may initially be mistaken for other diseases. However, Phytophthora blight quickly moves on to affect runners, crowns, and roots, causing the characteristic wilt and death of the entire plant.



Infected plants quickly wilt and die; fruit turns white with powdery masses of spores.

Fruit rots are another common expression of the disease. Initially, water-soaked lesions appear on the part of the fruit in contact with the ground. These lesions rapidly enlarge and become covered with a white, fuzzy growth. Internally, infected fruit tissues are discolored and rapidly collapse.

Disease cycle

Phytophthora blight overwinters on infected debris in the field. Spores may be able to survive in the soil without a host for up to 10 years. The pathogen is spread by splashing rain, flies, and human activity in fields with wet foliage. New fields become infested when equipment moves contaminated soil from a pathogen-infested field. The pathogen can also be spread through irrigation water when sources of water are ponds or streams fed by surface runoff. *Phytophthora capsici* may also be seed-borne, thereby increasing the potential for widespread distribution of the pathogen.



Flooded fields create ideal conditions for infection and growth of the *Phytophthora* fungus.

Warm, wet weather favors disease outbreaks. Symptoms typically appear in July and August after a heavy rainfall. Plants growing in low-lying areas will show symptoms first.

Control

There are no cures for infected plants, nor are any vine crop varieties resistant to Phytophthora blight. The most effective management strategies are use of best cultural practices and protective fungicide sprays of healthy plants when symptoms first appear in the field.

Cultural

To reduce the likelihood of infection, rotate crops out of cucurbits, and other susceptible crops for a minimum of 3 years.

Avoid saving seed from symptomatic plants and only plant disease-free seed from a reputable commercial seed dealer.

If symptoms of Phytophthora blight are observed in small plantings, immediately remove and destroy (burn or bury) all infected

plants and fruit from the planting area. In commercial fields, plow or disc infected plant debris immediately after harvest to hasten decomposition of plant material and to reduce pathogen spread.

Water management is critical in preventing infection. Plant vine crops in well-drained soils or on raised beds and avoid low-lying areas. Avoid over-irrigating the crop as standing water is a critical factor in disease development. Also avoid working in the crop when the vines are wet from dew, rain, or irrigation.

Chemical

If infection should occur, fungicides may be used to protect healthy plants from becoming infected. Begin spraying plants once the disease appears in the field and continue every 7–10 days until harvest. During rainy periods, treat every 5–7 days. Refer to Extension publication *Commercial Vegetable Production in Wisconsin* (A3422) for a list of recommended fungicides.

Relative susceptibility of various vegetables

Crops	Root/crown rot	Leaf blight	Fruit rot
Vine crops			
Cucumber	tolerant	tolerant	very susceptible
Melon	tolerant	somewhat tolerant	somewhat susceptible
Pumpkin	very susceptible	very susceptible	very susceptible
Summer squash	most susceptible	very susceptible	most susceptible
Watermelon	somewhat tolerant	somewhat tolerant	somewhat tolerant
Zucchini	very susceptible	somewhat susceptible	most susceptible
Solanaceous crops			
Eggplant	somewhat tolerant	somewhat tolerant	somewhat tolerant
Pepper	mildly susceptible	somewhat susceptible	somewhat susceptible
Tomato	somewhat tolerant	somewhat tolerant	mildly susceptible



Copyright © 2009 University of Wisconsin-System Board of Regents and University of Wisconsin-Extension, Cooperative Extension

Authors: Karen Delahaut was senior outreach specialist with the fresh market vegetable program, Walt Stevenson is emeritus professor of plant pathology, College of Agricultural and Life Sciences, University of Wisconsin-Madison and University of Wisconsin-Extension. Produced by Cooperative Extension Publications, University of Wisconsin-Extension.

University of Wisconsin-Extension, Cooperative Extension, in cooperation with the U.S. Department of Agriculture and Wisconsin counties, publishes this information to further the purpose of the May 8 and June 30, 1914 Acts of Congress; and provides equal opportunities and affirmative action in employment and programming. If you need this material in an alternative format, contact the Office of Equal Opportunity and Diversity Programs or call Cooperative Extension Publications at 608-262-8076.

This publication is available from your Wisconsin county Extension office or from Cooperative Extension Publications. To order, call toll-free 877-WIS-PUBS (947-7827) or visit our web site at learningstore.uwex.edu.