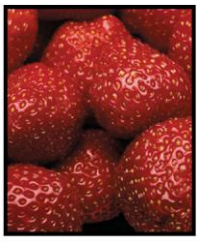
CORNELL COOPERATIVE EXTENSION - SUFFOLK COUNTY

INSECT AND PLANT DISEASE DIAGNOSTIC LABORATORY

EDUCATION CENTER
423 GRIFFING AVENUE
RIVERHEAD, NY 11901
HORT INFO LINE 631.727.4126

Cornell University
Cooperative Extension
of Suffolk County

BAYARD CUTTING ARBORETUM
MONTAUK HWY. PO BOX 463
OAKDALE, NY 11769
HORT INFO LINE 631.581.4223



Early Blight and Septoria Leaf Spot of Tomato

EARLY BLIGHT, caused by the fungus *Alternaria solani*, is one of the most common and damaging diseases of tomatoes in the northeastern states in home gardens. It is primarily a leaf spot and foliage blight, but also may cause a black spotting around the stem end and shoulders of ripe fruits in late autumn.

Symptoms: The first symptom of early blight is the appearance of small dark brown spots on the lowest, oldest leaves. These range in size from a pinpoint to 1/2 inch in diameter. When weather conditions are right (75^0 to 85^0 F.) with high humidity, these spots enlarge with a concentric-ring pattern as a result of daily growth and spore production by the organism. This target-board symptom aids in diagnosis of early blight (**Figure 1.**). There is usually a narrow yellow zone around the spots, which fades into the normal green. The spots enlarge, become irregular, and make the leaflets turn yellow and die. Symptoms generally begin to show in midseason after many fruits have set, but become severe later when a heavy fruit load, high soil temperatures, or dry weather stresses the plant. After the lower leaves are damaged or even lost, the symptoms move up the plant and repeat the process until sometimes all leaves on the lower part of the plant are lost. Spots may appear on the main stem to cause partial girdling and further damage to the plant parts above such areas (**Figure 2.**). Excessive defoliation exposes late fruit to sunscald and encourages the "freckles" fruit symptom caused by a related fungus, *Alternaria tenuis*. Ripe fruits may be invaded by the early blight fungus near the point of attachment to the stem and may exhibit concentric patterns like those on the lower leaves.

Figure 1. Typical leaf symptom of early blight. (*Note the concentric ring pattern or "target-board" symptom, which is a distinct symptom of early blight*) (Clemson University, USDA Cooperative Extension Slide Series)

Figure 2. Stem girdling (canker) due to early blight infection (*Note the concentric ring pattern*) (Clemson University, USDA Cooperative Extension Slide Series)

Causal Agent: *Alternaria solani* can live for at least a year in diseased vines and also in nightshade. When environmental conditions are right and a tomato plant is nearby, spores arise and infect leaves as described above. The numerous spores in the new leaf spots then splash in rain or irrigation water to other tomato plants under stress, until several disease cycles have been completed and the weather has turned cool. Inadequate fertility and organic matter, minor element deficiency, and lack of soil moisture predispose tomatoes to infection and set the stage for an epidemic where plants have not been protected by fungicides. The fungus can be carried on and under the seed coat.

SEPTORIA LEAF SPOT: The causal agent for the leaf spot is *Septoria lycopersici*. Septoria leaf spot is a fungus disease of tomato foliage and is of no importance as a fruit rot. The disease is

worldwide in occurrence and can cause as much defoliation as early blight when weather conditions are favorable. A number of solanaceous weeds also act as hosts, such as Jimson weed, horse nettle and nightshade.

Symptoms: Although symptoms may appear on leaves and stems at any stage of plant development, they usually become most evident after fruit set. First infections are usually found on older leaves near the ground. Small, water-soaked, roughly circular spots appear, scattered over the leaves. These spots enlarge to become 1/16 to 1/4 inch in diameter with dark margins and gray to tan centers (**Figure 3.**). Small, dark, pimple-like fruiting bodies in which spores of the fungus are produced, can be seen with a 10x hand lens on the surface of lesions. When leaves are heavily infected, they drop prematurely and exposed fruits are more likely to sunscald.

Figure 3. Characteristic leaf spots with gray centers caused by *Septoria*. (*Note the small dark, pimple-like fruiting bodies (pycnidia*))

Pest Management Practices

Disease sanitation practices: Avoid wetting leaves when watering. Water early in the day so foliage will dry quickly. Avoid crowding; space plants to allow good air circulation. Eliminate nearby weeds, to improve air circulation. Remove any diseased or dropped leaves. At the end of the season, remove all plant tops, and dig up and remove roots.

Septoria occurs early in the season, preferring cool wet weather. Use clean transplants and remove lower infected leaves.

Try an Early Blight tolerant variety such as Mt. Supreme.

If needed, use azoxystrobin (not near apples), *Bacillus subtilis*, chlorothalonil, copper soap (copper octanoate), or copper sulfate.

Always check the pesticide label to make sure both the crop and the pest are listed, and to check for the minimum number of days to wait between application and picking the crop ("Days to Harvest").

Text for early blight by: Arden F. Sherf, Department of Plant Pathology, Cornell University; text for *Septoria* leaf spot from: *Foliar Blights of Tomato*, V38, 1987, Ohio State University.

Pesticide and management recommendations obtained from*: Part I Guide to Pest Management Around the Home, Cultural Methods* and *Part II -- Pest Management Around the Home, 2009-2010 Pesticide Guidelines*, Miscellaneous Bulletins 139S74-I and 139S74II, Cornell Cooperative Extension Publications. Online versions of these publications are available at http://ipmguidelines.org/Home/

The Pesticide Management Education Program (PMEP), in cooperation with the New York State Department of Environmental Conservation (NYSDEC), maintains a web site with a searchable database for pesticide products currently registered in New York State. Homeowners who have Internet access can locate currently registered products at **http://pmep.cce.cornell.edu/pims/current**. Several different queries are available that will produce a summary for the product(s) that the system locates. If the system fails to locate the product in question, then that product is not currently registered in New York State. The database also provides a summary of important information related to every product currently registered. Two data fields "Status" and "Expiration Date" are provided in each summary. Products with a status of "Registered - Discontinued" are currently registered but will probably be discontinued for use, sale, and distribution in New York State after the date noted in the "Expiration Date" field.

This publication contains pesticide recommendations. Changes in pesticide regulations occur constantly and human errors are still possible. Some materials mentioned may no longer be available, and some uses may no longer be legal. All pesticides distributed, sold or applied in New York state must be registered with the New York State Department of Environmental Conservation (DEC). Questions concerning the legality and/or registration status for pesticide use in New York State should be directed to the appropriate Cornell Cooperative Extension specialist or your regional DEC office. Read the label before applying any pesticide.

TK: 10/2009