College of Agriculture, Food and Environment
Cooperative Extension Service

Plant Pathology Fact Sheet **PPFS-VG-26**

Early Blight & Septoria Leaf Spot of Tomato
Disease Management for Residential Growers

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Importance

Early blight (Figure 1) and Septoria leaf spot (Figure 2) are the most common fungal diseases of tomato in Kentucky gardens. Both diseases affect leaves when weather becomes warm and wet, often beginning in early summer and extending through the season. Frequently occurring together, they can significantly reduce yields during seasons with warm, wet weather.

Symptoms & Signs

Early Blight

Leaves

Early blight begins as small, brown-black, circular-to-elliptical spots (lesions) on older foliage, especially on leaves that are close to the ground. Concentric rings within the spots give them a target-like appearance (Figure 1). Lesions enlarge rapidly and individual spots can increase to ½ inch in diameter. Leaf tissue surrounding the spots may become yellow (chlorotic) (Figure 1). Affected leaves wither, die, and drop, giving plants a blighted appearance (Figure 3).

Fruit

Fruit may become infected at any stage of development. Like the leaf spots, fruit lesions have a target-like appearance (Figure 4A). Diseased areas, which often begin at the stem end, can encompass large portions of the fruit. Lesions become sunken and leathery with age. Under humid conditions, a thick mass of black spores develops on the lesion surface giving it a velvety appearance (Figure 4B). As a secondary effect of this disease, healthy fruit can be damaged by sunscald due to excessive exposure to sunlight when plants are defoliated.

Stems & Petioles

Lesions developing on stems and petioles are elliptical and have the same target-like appearance characteristic of early blight on leaves and fruit (Figure 5). Girdling lesions result in the death of the distal leaves/leaflets.

Figure 1. Early blight is characterized by target-like lesions with concentric rings, accompanied by leaf yellowing.

Figure 2. Septoria leaf spots are tan to gray with darker margins.

Figure 3. Severe early blight infections result in extensive blighting and defoliation.

Figure 4 Early blight fruit infections result in target-like lesions, similar in appearance to foliar lesions **(A)**. Masses of spores covering fruit lesions gives them a velvety appearance **(B)**.

Figure 5. Target-like lesions can develop on stems and petioles as a result of early blight infections.

Septoria Leaf Spot

Septoria leaf spot begins as circular to semi-circular spots with tan-to-gray centers and dark margins (Figure 2), which first develop on lower foliage. Lesions, which can also appear on stems (Figure 6), become dotted with black spore-producing structures (pycnidia); foliar spots are often surrounded by a yellow halo (Figure 7). While individual lesions remain smaller than 1/3 inch in diameter, spots may coalesce. Entire leaves may die, followed by defoliation. Infections on fruit are rare; however, sunscald damage to fruit can occur on defoliated plants.

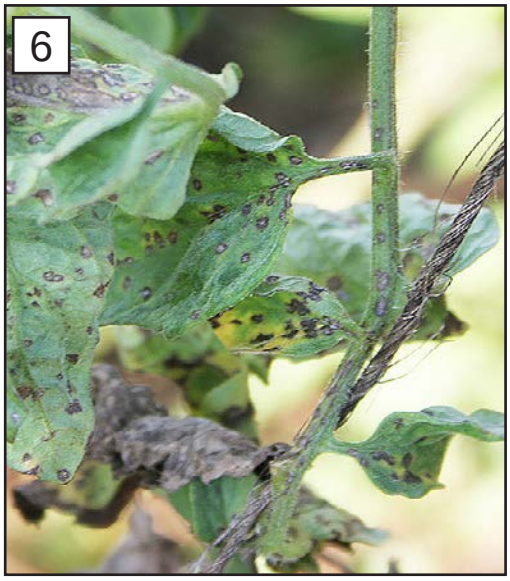

Figure 6. Septoria leaf spot lesions appear on tomato foliage and stems.

Figure 7. The light tan-gray centers of Septoria leaf spot lesions become dotted with fungal fruiting bodies (pycnidia). Spots may be surrounded by a yellow halo.

----- Distinguishing Symptoms & Signs -----

Early Blight

Lesions with a target-like appearance due to concentric rings of light and dark brown.

Septoria Leaf Spot

Tan to grey spots with dark brown margins; tiny black dots (fungal fruiting bodies) in spot centers.

Causes & Disease Development

Early blight can be caused by one or more fungal species in the genus *Alternaria.* These fungi overwinter on infected plant debris, on seeds, and in common weeds. Infections are favored by moderate-to-warm (60° to 80°F), wet weather. The pathogens affect a wide range of crops, ornamentals, and weeds across many plant families.

Septoria leaf spot, which is caused by the fungus *Septoria lycopersici*, overwinters in infected plant debris and weeds. Infections are favored by moderate-to-warm (60° to 80°F), wet weather.

Once tissues become infected, the early blight and Septoria leaf spot pathogens produce spores (conidia) that result in secondary infections during favorable weather conditions. Conidia are mainly disseminated short distances by wind and rain splash; however, human contact and equipment can also aid in pathogen spread. Secondary spores continue to infect healthy tissue as long as conditions are warm and wet.

Disease Management

Similar management practices can be followed for both early blight and Septoria leaf spot.

Cultural practices

- Do not plant tomatoes in the same growing site for at least 2 years. In the case of early blight, also avoid planting potato or eggplant during the 2-year crop rotation as they are also hosts.
- Plant tomato varieties with tolerance to these diseases. Generally, cherry or grape types and hybrid varieties tend to be more tolerant than slicer or heirloom cultivars. Several cultivars are available with resistance to early blight; resistance to Septoria leaf spot is also available but less common. Disease resistance is usually referenced on seed packets and plant labels.
- Manage weeds that may serve as secondary hosts for the pathogens. Weeds can also reduce air circulation and result in increased humidity within plantings, thus promoting disease development.
- Provide conditions that will facilitate leaf drying and minimize a favorable environment for disease.
  - Choose a planting site in full sun with good air circulation.
  - Consider the size of plants at maturity when planting and provide sufficient spacing.
  - Avoid use of overhead irrigation.
- Use mulch under plants to reduce contact between foliage and the soil, as well as rain splash of fungal spores.
- Follow good sanitation practices in order to lessen the amount of overwintering inoculum (e.g. fungal spores) for the following season. This includes cleaning equipment and tools after use and removing/burying all plant debris at the end of the season.

Fungicides

Apply a fungicide at the first indication of disease. Be sure that the target disease and crop is listed on the label. Contact a local Extension office for current fungicide recommendations.

Additional Resources

- Homeowner's Guide to Fungicides (PPFS-GEN-07) https://plantpathology.ca.uky.edu/files/ppfs-gen-07.pdf
- Home Vegetable Gardening in Kentucky http://www2.ca.uky.edu/agcomm/pubs/id/id128/id128.pdf
- IPM Scouting Guide for Common Pests of Solanaceous Crops in Kentucky http://www2.ca.uky.edu/agcomm/pubs/id/id172/id172.pdf
- Disease-resistant Tomato Varieties (Cornell University Vegetable website) https://www.vegetables.cornell.edu/pest-management/disease-factsheets/disease-resistant-vegetable-varieties/disease-resistant-tomato-varieties/

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