

Managing Early Blight of Tomato in Tennessee

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Disease Overview

Tennessee's climate is favorable for one of the most common diseases of tomato, early blight. Early blight is caused by the fungus *Alternaria linariae*, but it is often referred to as *A. solani* and *A. tomatophila* in older literature. Early blight thrives in regions with mild winters, high humidity and warm temperatures during the growing season (80-90 degrees F). Development of early blight progresses over the entire course of the growing season. The disease is most damaging in field-grown tomatoes, especially in seasons with heavy rainfall, but it may be present in greenhouse and high tunnel operations. Defoliation caused by early blight may lead to sunscald, reduced fruit yield and reduced fruit quality (Figure 1).

Diagnosing Early Blight

Tomato plants may show symptoms of early blight at any age. Typically, older leaves nearest to the soil will become infected first and display small lesions (one-fourth to one-half inch in diameter) that are brown or black at their center (Figure 2). Lesions often develop characteristic "bullseye" rings and leaf yellowing may be observed around the lesions (Figure 3). Infected stems of tomato appear as lesions with a light-colored center that are dark on the exteriors (Figure 4). Stem lesions may girdle the stem completely, causing collar rot and even damping off in seedlings. Leaf yellowing and defoliation from early blight occur in an upwards direction towards newer growth. Lesions on the tomato fruit are dark brown and leathery. Lesions may eventually envelop the entire fruit and show signs of velvety spores. Fruit lesions may also be observed near the stem attachment and on the fruit shoulder and may be confused with or associated with fruit cracking (Figure 5).

Management

Cultural Control

Early blight can survive between planting seasons in soil, planting material and debris, and therefore management practices should focus on combating these pathogen sources. Although early blight can spread by windborne spores, infection is most commonly caused by water splash. The following steps can be taken to manage early blight in tomato:

- Rotate away from tomato and other solanaceous hosts (such as potato or eggplant) for at least two years to reduce disease pressure.
- Manage weeds and volunteer solanaceous plants.
- Use disease-free seedlings.
- Maintain optimal plant health through proper irrigation and fertilization.
- Avoid working with plants when wet.
- Use drip irrigation instead of overhead irrigation to reduce leaf wetness and soil splash.
- Remove branches that are near to the ground once tomato fruit begins to develop. This can reduce infection by soil splash and increase air flow.
- Mulch may reduce soil splash onto leaves and fruit.

Planting tomato varieties with some tolerance or resistance to early blight is recommended. Several varieties with early blight tolerance or resistance are listed in Table 1. In the context of plant diseases, tolerance is defined as the ability of a plant to endure a disease without serious damage or yield loss. Resistance is defined as the ability of a plant to prevent or impede disease development. It is likely that most of the varieties in Table 1 can still be affected by early blight to some extent. See the most recent version of the [Southeastern U.S. Vegetable Crop Handbook](#) for an updated list of tomato varieties recommended for Tennessee.

Table 1. Examples of tomato varieties with some resistance or tolerance to early blight.*

Type	Variety
Grape	Honey Bunch F1
	Valentine F1
Cherry	Green Doctors Frosted
	Jasper F1
	Matt's Wild (Heirloom)
	Mt. Magic F1
	Super Sweet 100 F1
	Tommy Toe (Heirloom)
	Summer Sweetheart (Compari)
Heirloom-type slicer	Aosta Valley
	Brandywine
	Marnero F1
Plum	Indigo Rose
	Juliet F1
	Plum Regal F1
	Verona F1
Slicer	Brandywise
	Defiant PhR
	Iron Lady F1
	Mt. Fresh Plus F1
	Mt. Merit F1
	Old Brooks
	Stellar F1

*The tomato varieties listed here have resistance or tolerance reported in Extension literature. Early blight resistance in these varieties has not been independently validated by UT Extension or UT AgResearch.

Chemical Control

Fungicides can be used as an effective treatment for early blight (Figure 1). Fungicides should be used in addition to the cultural practices described earlier and are best used preventatively before disease becomes severe. Fungicides must always be applied according to the product label. Home gardeners can refer to the UT Extension Publication [“Conventional and organic product overview for home vegetable gardeners in Tennessee, W 661”](#) for a list of conventional and organic products available for managing early blight. Conventional products such as those containing chlorothalonil or mancozeb as the active ingredient will probably provide the best control for home gardeners. Organic products may provide some control, but cultural practices aimed at reducing disease pressure should be prioritized for organic tomato production. Commercial growers should refer to the most recent version of the [Southeastern U.S. Vegetable Crop Handbook](#) for an updated list of fungicides for managing early blight. Conventional growers can achieve good early blight control by following recommended cultural practices and applying fungicides every seven to 10 days. Organic growers should expect to achieve less control through fungicide applications and should therefore focus on cultural practices to manage early blight.

Additional resources

1. [2021 Southeastern US Vegetable Crop Handbook](#)
2. [Cornell University disease-resistant tomato varieties](#)
3. [Conventional and organic product overview for home vegetable gardeners in Tennessee](#)

Precautionary Statement

To protect people and the environment, pesticides should be used safely. This is everyone's responsibility, especially the user. Read and follow label directions carefully before you buy, mix, apply, store or dispose of a pesticide. According to laws regulating pesticides, they must be used only as directed by the label.

Disclaimer

This publication contains pesticide recommendations that are subject to change at any time. The recommendations in this publication are provided only as a guide. It is always the pesticide applicator's responsibility, by law, to read and follow all current label directions for the specific pesticide being used. The label always takes precedence over the recommendations found in this publication.

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Figure 1. Tomato plants protected from early blight by a conventional fungicide program (top) compared to non-protected plants (bottom). The conventional fungicide program consisted of Inspire Super, Manzate Pro-Stick, Fontelis and Manzate Pro-Stick applied in rotation every seven to 10 days.



Figure 2. Early blight lesion on a tomato leaf showing characteristic “bullseye” concentric rings.



Figure 3. Early blight lesions on a tomato leaf showing characteristic “bullseye” concentric rings and leaf yellowing radiating outward from the lesions.



Figure 4. Early blight lesions on a tomato stem showing light centers and darker edges (Gerald Holmes, Strawberry Center, Cal Poly San Luis Obispo, Bugwood.org).



Figure 5. Early blight on tomato fruit. Characteristic leathery lesions and dark patches of spores (upper) and lesion near the stem attachment associated with fruit cracking (lower). Upper image: Yuan-Min Shen, Taichung District Agricultural Research and Extension Station, Bugwood.org; lower image: Penn State Department of Plant Pathology and Environmental Biology, Bugwood.org.



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