

CMG GardenNotes #718

Tomato Early Blight

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For additional information on growing tomatoes, refer to the *CMG GardenNotes #717, Growing Tomatoes*.

Early Blight, caused by the fungus *Alternaria solani*, is common on garden tomatoes and potatoes, and occasionally infects eggplants and peppers.

Symptoms

Symptoms typically appear soon after fruit set; starting on the lower leaves as tiny dark brown spots. The spots enlarge to over 1/2 inch in diameter and develop a grayish-white center with a darker border. As the spots enlarge, they develop concentric, target-like rings. Spots may also develop on fruit and stems. Stem spots may enlarge to girdle the plant.

With the progression of the disease, leaves turn yellow and the spots make them appear "freckled." Eventually the leaves turn brown and drop off. Black *pycnidia* (fungal fruiting bodies that appear as pinhole sized black dots) form in the center of the spots as they mature.



Figure 1. Yellowing and halo target marking from Early Blight. [Photo from USDA]

When the *pycnidia* become wet, fungal spores ooze out. The spores are spread by splashing water, insects, wind, and human contact. During rainy weather or overhead irrigation, spores quickly spread the disease through the patch.

The disease is favored by warm wet weather, overhead irrigation, and where heavy foliage delays the drying of leaves. A moist 48-hour period is required for infections to occur. It is not necessary that this be a continuous period, but may be cumulative over several days.

In the garden, the fungus can over-winter on diseased plant debris and in perennial weeds such as horse nettle and nightshades. These serve as sources for inoculum and for primary infections in the spring.

Management

Control measures center around reducing the amount of inoculum (spores) available, and promoting rapid drying of wet leaves.

Spacing and Trellising Plants

Space and trellis plants to allow for good air circulation that promotes rapid drying. Minimal spacing for trellised tomatoes is two feet apart. Research has demonstrated that crowding plants will not increase yields, but does increase disease problems.

The American Society for Horticultural Science suggests a cage-type trellis two feet in diameter by four to five feet tall. It is easy to make from a 6½-foot length of concrete reinforcing mesh or similar fencing materials. Cut off the bottom ring of wire so the cages can be pushed into the ground.

Trellising also increases the distance of the upper leaves from the sources of inoculum on the soil and lower leaves.

For additional information on trellising tomatoes, refer to *CMG GardenNotes* #717, **Growing Tomatoes**.

Mulch

Use a mulch (such as black plastic) to help protect the plant from inoculum splashing from the soil onto lower leaves. Removing leaves in the lower 8 to 12 inches of the plant (as the plant grows) also helps protect lower leaves from infections splashing from the soil. For additional information on using black plastic mulch, refer to the *CMG GardenNotes* #715, **Mulches for the Vegetable Garden**.

Irrigation

Avoid overhead sprinkling on tomatoes. Fungal spores are easily water-splashed from one leaf to another, and they depend on standing water on the plant surface to cause infections. It may also be helpful to water in the morning in order that plants dry quickly. Plants that remain wet all night from evening watering are prime targets for disease infection.

For additional information on vegetable garden irrigation, refer to the *CMG GardenNotes* #714, **Irrigating the Vegetable Garden**.

Fertilization

A mid-summer loss of plant vigor from inadequate moisture or fertilizer will leave the plant more susceptible to the fungi. In home gardens, Early Blight frequently explodes due to low nitrogen levels in mid to late summer.

Fertilize tomatoes lightly as the first fruits reach two inches in diameter. Additional monthly applications may also be helpful (every two weeks on a sandy soil). However, avoid heavy applications of nitrogen that can over-stimulate vine growth at the expense of fruiting and prompt blossom end rot.

Water-soluble fertilizers (such as MiracleGro, RapidGro, and Peters) applied according to label directions can be used as summer fertilizer supplements.

If using a dry granular fertilizer (such as 21-0-0, ammonium sulfate), apply one level tablespoon per plant. Sprinkle the granular fertilizer in a wide circle 12 to 20 inches out from the plant, and water in. Dry granular fertilizers can easily kill the tomatoes if over-applied

Weed Control

Keep the garden weed-free. Common weeds harbor many garden diseases. Volunteer potatoes and tomatoes can be a source of inoculum for Early Blight.

Remove Infected Leaves

Remove infected leaves as soon as noticed. Wash hands with soap and water immediately after touching diseased leaves to prevent spreading spores to other plants. Avoid working with the plants when they are wet.

Rotation

Since a fungal source is the soil, rotation is a management tool. However, this may not be practical in most small, home garden situations because a rotation plan allows no tomatoes, potatoes, eggplants, vine crops, strawberries, or raspberries in the same growing area for at least four years. In a garden bed, moving the tomatoes a few rows to the left or right is not an effective rotation.

Fall Clean Up

Remove all tomatoes and potato debris in the fall. Dispose of debris in municipal trash or by burial. Do not compost unless the compost heats to at least 145° and the pile is turned occasionally. Most home compost piles do not adequately heat to kill pathogens.

Fungicides

During years with frequent rains, supplementing the above cultural practices with fungicide applications may be necessary to protect the plants. Start spraying at the first sign of spotting on lower leaves, typically in July. Once the disease begins to yellow leaves, fungicides lose effectiveness.

Complete coverage, including the lower leaves is essential for control. Repeat applications at 10 to 14 day intervals as needed. Under moist conditions,

reapplication may be needed at seven-day intervals.

Effective fungicides include Chlorothalonil (Daconil 2787, Ortho Multi-Purpose Fungicide) and EBDC fungicides (such as Mancozeb and Maneb).

The use of these fungicides calls for protective clothing, including rubber gloves, long sleeved shirt, and long pants.

These fungicides are toxic to fish and aquatic life. Do not apply directly to water (lakes, streams, ponds, or wetlands). Do not use on lands adjacent to water or wetlands, where drift or runoff could become hazardous to aquatic life.

Additional Information – CMG GardenNotes on vegetable gardening:

#711	Vegetable Garden Soil Management and Fertilization	#718	Tomato Early Blight
#712	Sample Vegetable Garden Seed Catalogs	#719	Vegetable Garden Hints
#713	Block Style Layout in Raised Bed Vegetable Gardens	#720	Vegetable Planting Guide
#714	Irrigating the Vegetable Garden	#721	Sample Planting for Raised-Bed Garden
#715	Mulches for the Vegetable Garden	#722	Frost Protection and Extending the Growing Season
#716	Water Conservation in the Vegetable Garden	#723	Growing Vegetables in a Hobby Greenhouse
#717	Growing Tomatoes	#724	Vegetable Gardening in Containers

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- Colorado Master Gardener *GardenNotes* are available online at www.cmg.colostate.edu.
- Colorado Master Gardener training is made possible, in part, by a grant from the *Colorado Garden Show, Inc.*
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Minor revisions July 2011

