

## Eggplant, Pepper, and Tomato

### Cladosporium Leaf Mold

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#### Identification and Life Cycle

Cladosporium leaf mold is a disease of tomato caused by the fungus *Fulvia fulva* (syn. *Cladosporium fulvum*). The disease is primarily a problem on greenhouse-grown tomatoes, but can occur in the field when humidity is high. Fungal spores germinate under high humidity (85% or greater) and cool to warm temperatures (40 to 90°F), but disease rarely occurs below 50°F. Wind, splashing irrigation water and rain, workers, tools, and insects readily disseminate spores. Contaminated seed can also initiate epidemics. The pathogen survives between tomato crops in and on crop residues, and in the soil as spores (conidia) or dormant resting structures (sclerotia).

#### Plant Response and Damage

Leaf mold is most damaging to greenhouse-grown tomatoes, but can occur occasionally on field-grown tomatoes in the High Plains. Disease symptoms are usually limited to foliage, and first appear on the upper sides of older leaves as pale green or yellow spots. Leaf spots have irregular borders, but when infection is severe these spots coalesce and kill large areas of the foliage. The upper surface of affected leaves turns an olive green with more intense color near the center of lesions. Leaves eventually curl, wither, and may drop from the plant. Blossoms, stems, and fruit can be attacked by *F. fulva*. Affected fruit has a black, leathery rot on the stem end with an irregular margin.

#### Management Approaches

##### Biological Control

No biological control strategies have been developed for leaf mold.

## Cultural Control

Plant only high quality seed free from the leaf mold pathogen. Hot water treatment can reduce seed contamination, but can reduce germination. Eliminate crop debris and culls by deep tillage soon after harvest to reduce pathogen survival. Promote rapid drying of leaf foliage by avoiding overhead irrigation and dense plantings. Planting parallel to the prevailing wind direction can hasten leaf drying and reduce leaf mold severity. In greenhouse production, thoroughly sterilize production areas by steam to eliminate *F. fulva*. Minimize wetting the foliage when irrigating tomatoes. Maintain night temperatures higher than outside temperatures. Resistant varieties are available, but many races of the pathogen exist, and resistance can be overcome quickly by the appearance of new races.

## Chemical Control

Fungicides control leaf mold, but should be used in combination with as many cultural control strategies as possible to be most effective.

### *Product List for Cladosporium Leaf Mold:*

<b>Pesticide</b>	<b>Product per acre</b>	<b>Application Frequency (days)</b>	<b>Remarks</b>
<b>Captan</b>			
Captan 4F	4 pt	5-7 days	4 day REI
Captan 50	2 lb	5-7 days	4 day REI
<b>Chlorothalonil and Chlorothalonil Mixtures</b>			
Bravo 720, Ensign	1.5-3 pt	7-14 days	Do not graze or feed debris to livestock; 7 day PHI
Bravo Ultrex	1.7-2.2 lb	7-10 days	Maximum of 18.3 pounds per season; 0 day PHI
Bravo Weather Stik	1.5-3.0 pt	7-10 days	Maximum of 20 pints per season; 0 day PHI
Echo 720	1.5 -3.0 pt	7-10 days	Maximum of 2.5 gallons per season; 0 day PHI
Echo 90DF	1.7-2.5 lb	7-14days	Maximum of 16.67 pounds per season; 0 day PHI
Echo Zn	3-4 pt	7-10 days	Maximum of 3.6 gallons per

			season; 0 day PHI
Ridomil/Bravo	2-3lbs	14 days	Maximum of three applications; 14 day PHI
<b>Copper Fungicides</b>			
Champ Dry Prill	1.33 lb	5-7 days	
Champ Formula 2	1.33 pt	5-7 days	
Copper-Count-N	4-6 pt	7 days	
Cuprofix Disperss	2.5-6 lb	7-10 days	
Kocide 101	1.5-3 lbs	5-7 days	
Kocide DF	1.5-3 lbs	5-7 days	
Kocide 4.5LF	1-2 pts	5-7 days	
Nordox	1.5-2.0 lb	7-10 days	
Tri Basic Copper	2-4 pt	7-10 days	1 day PHI
<b>EBDC, Copper/EBDC, and EBDC/Zoxamide</b>			
Cuprofix Disperss MZ	1.75-4.75 lb	3-10 days	Maximum of 21 pounds per season; 5 day PHI
Dithane DF	2-3 lb	7-10 days	Maximum of 8.5 pounds per season; 5 day PHI; use a non-ionic surfactant to improve performance
Gavel 75DF	1.5-2.0 lb	7-10 days	Maximum of 8 applications or 16 pounds per season; 5 day PHI; include a nonionic surfactant to improve performance
Maneb 75 DF	1.5-2.0 lb	7-10 days	Maximum of 8.0 pounds per season; 5 day PHI
Manex 80W	1.5-2.0 lb	7-10 days	Maximum of 7.5 pounds per season; 5 day PHI
Manex	1.2-2.4 qt	7-10 days	Maximum of 16.8 quarts per season; 5 day PHI
ManKocide	2.5-5.0 lb	3-10 days	Maximum of 42.7 pounds per season; 5 day PHI
Manzate	0.75-1.0 lb	3-7 days	Maximum of 8.5 lbs per season; 5 day PHI
Penncozeb 80W	1.5-2.0 lb	7-10 days	Maximum of 7.5 pounds per season; 5 day PHI.
Penncozeb 75DF	1.5-2.0 lb	7-10 days	Maximum of 8.0 pounds per season; 5 day PHI.
<b>Famoxadone/Cymoxanil</b>			
Tanos	8 oz	5-7 days	Rotate and rotato with fungicides with a different mode of action such as chlorothalonil or mancozeb; Maximum of 72 ounces per

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**season; 3 day PHI**

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Date: 04/01/2007