



Cornell University
Cooperative Extension

BEST MANAGEMENT PRACTICES IN HIGH TUNNEL PRODUCTION

Leaf Mold

Leaf mold is a fungus disease of tomatoes that has been increasing across New York State in recent years. It is favored by high humidity and is therefore seen in greenhouse and high tunnel production but rarely in field production. It spreads rapidly from plant to plant, covering leaves with lesions and defoliating plants which severely reduces yield.



Leaf mold is caused by the fungus *Fulvia fulva*. It was formerly called *Cladosporium fulvum* and as of 2013 mycologists use the name *Passalora fulva*. It is also called 'brown leaf mold' or simply 'leaf mold'. Gray mold (*Botrytis cinerea*) is a different pathogen, not to be confused with leaf mold (*Fulvia fulva* or *Passalora fulva*).

Prevention and Control

Because high humidity (>85%) favors this disease, practices that increase air circulation throughout the tunnel including ventilation, spacing, pruning and training can help. Spores are carried on air currents, tools, worker clothing and seed, and spread quickly throughout the tunnel. The fungus overwinters on crop debris and in the soil and can persist for at least one year without a host crop. In spite of thorough sanitation at the end of the season, once a tunnel has had a leaf mold infestation, it is very likely to be infested the following year.

Fungicide sprays, including copper, have not proven effective in stopping the spread although more research needs to be done to consider other materials. Sporulation occurs on the underside of the leaves making it difficult to achieve adequate spray coverage. Currently, once a tunnel becomes infested the best practice is to use resistant varieties.

Grafting onto vigorous, root disease resistant rootstocks is a practice that is being more widely adopted by high tunnel growers. But because leaf mold is a foliar disease, not a root disease, grafting does not have an impact on the scion's resistance to leaf mold.

Resistant Varieties – the best approach



There several tomato varieties that show resistance to leaf mold (see page 4) but the pathogen continues to mutate into new races. New varieties are developed each year with further resistance. Planting several different leaf mold resistant varieties will help reduce grower risk from this disease.

None of the heirloom varieties such as *Brandywine*, *Pruden's Purple* and *Striped German* is resistant to leaf mold.

Photo: Resistant variety 'Rebelski' on left, susceptible variety 'Sun Gold' on right.

Leaf Mold - early symptoms



Early leaf mold symptoms: yellow spots on surface of leaf.



Typical early leaf mold lesions: yellow on top of leaf, brown and sporulating on underside of leaf.



Properly space, prune and train the crop to contain excess growth, keep aisles clear.

Determinate on left with stake and weave system.

Indeterminate on right with single leader system.

Tips

for increasing air circulation and air movement in tunnels to discourage leaf mold and other fungal diseases



Roll-down or roll-up side walls, high straight side walls. Large doorways on both ends, gable end vents would also help.

Leaf Mold Look-Alikes



Early blight - typical target lesion



Septoria leaf spot - distinct dark spots followed by leaf yellowing



Gray mold on leaf causes tip dieback



Late blight - large lesions expand rapidly with no distinct margins



Bacterial speck - small, dark distinct spots, with yellow margins



Magnesium deficiency - yellowing between veins, yellow areas turn brown with time

These are NOT Leaf Mold

Some varieties resistant to Leaf Mold

New, resistant varieties are introduced each year. This is partial list is current as of 2015.

Cherry/Grape Type

Favorita
Golden Sweet
Pareso (grape)
Picus (determinate, Roma)
Sakura
Sunpeach (pink)
Sweet Chelsea
Sweet Elite (grape)
Sweet Gold (yellow)
Sweet Hearts
Sweet Treats (pink)
Viva Italia (derminate, pear)



Salad/Slicers

Bellini
Beorange (orange)
Big Dena
Caramba
Clermon (truss type)
Climstar (cluster)
Frederick (compact)
Geronimo
Margold
Panzer
Pink Cupcake
Pink Wonder
Primo Red (determinate)
Poseiden (pink)
Rally (determinate)
Rebelski
Red Deuce (determinate)
Rossini
Tomimaru Muchoo (pink)
Trust



Some popular varieties that are susceptible to leaf mold

(this is a partial list, not comprehensive)

Arbason	Big Beef
Brandywine and heirlooms	
Estiva	Pruden's Purple
Red Bounty	Striped German
Sun Gold	Sun Sugar
Sweet 100	Volante

Some Useful Websites:

<http://www.hort.cornell.edu/hightunnel>

<http://vegetablemdonline.ppath.cornell.edu/>

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