

Gray Mold of Tomato

Keep Tomatoes Disease Free

Tomato diseases can start and spread rapidly even in protected environments such as high tunnels and hoop houses.

Causes of the Disease

Botrytis blight or gray mold is a disease caused by the ever-present fungus, *Botrytis cinerea*. The disease often occurs during cool weather. It is always linked with too much moisture and high humidity. In covered beds and greenhouses with poor ventilation, just the dampness within a tomato canopy at night enables the disease to develop. Although this fungus begins in cool weather, it can also infect tomatoes at warm temperatures, but at a reduced rate. In protected systems, such as hoop houses and greenhouses, the disease can start and spread rapidly, resulting in a great economic loss.

Living Conditions of the Fungus

As mentioned above, *Botrytis cinerea* needs relatively cool temperatures for best growth: 64.4-73.3°F (18-23°C). Growth of this fungus slows as temperatures rise above 89.6°F (32°C). The fungus produces conidia (spores) that are easily windborne, blowing from field to field. Conidia are borne on conidiophores (stalks); the arrangement of conidia gives the fungus its name, botrys, which means “a cluster of grapes” in Greek. Also, the fungus might produce overwintering spores called sclerotia. Sclerotia are able to survive from season to season. Sclerotia may also form in plant tissue and germinate forming mycelia (the branching part of fungi) that produce conidia.

Diagnosis of Symptoms and Signs

Symptoms start as gray to brown discolorations with water-soaked, tan, brown



Figure 1 Gray mold on stem (top) and leaf (bottom) of a tomato plant. Leaf photo courtesy of: Dan Egel (Purdue University)

spots on the leaf and stem surfaces. These surfaces become covered with a profuse growth of gray, velvety, dusty mold (mycelium and conidia) arising from the necrotic (dead) tissues. This growth gives the diseased tissue a fuzzy, gray-brown look (Figure 1-top image). Gray mold infects all the aboveground parts of a tomato plant (Figure 1-bottom image). This mold is mostly associated with mature plants that have a dense canopy. Pruning leaves and clusters provides wounds that are ideal for gray mold to invade. It will girdle the stems if not killed in a timely manner (Figure 1).

How to Manage this Disease

Non-chemical methods: Remember that this disease prefers cool and damp weather. The following cultural methods help to prevent gray mold:

1. **Keep leaves dry** - Avoid sprinkling water as the fungus is easily spread by splashing water and wind.



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2. **Maintain healthy plants** - Follow proper fertilizer and irrigation guidelines and pruning practices.
3. **Provide good air circulation** - Do not overcrowd plants; remove weeds immediately.
4. **Sanitation** - This is one of the best ways to reduce this disease. Collect and discard affected plant parts.
5. **Liming acid soils** - Increasing the calcium content of plants will make the tomato plants less susceptible to the disease.

Fungicides: Sprays should start before a dense canopy of the tomato plant develops. This is important no matter what type of fungicide is used. In addition, most fungicides registered to control gray mold are only protective—they will not suppress an established infection. Always read the label, and consult Extension experts in your area for any updates on fungicide use.

The table below (Table 1) is modified from the Midwest Vegetable Production Guide for Commercial Growers 2014. **REI** = re-entry interval in hours; **PHI** = pre-harvest interval in days.

Before applying ANY pest control product, do the following: (1) read the label to be sure that the product is labeled for the crop and for the disease you intend to control, (2) read and understand the safety precautions and application restrictions, and (3) make sure that the brand name of the product is listed in your Organic System Plan and approved by your certifier (organic growers). Note: Trade names in this publication are used solely for the purpose of providing specific information. Such use herein is not a guarantee or warranty of the products named and does not signify that they are approved to the exclusion of others. Mention of a proprietary product does not constitute an endorsement nor does it

imply lack of efficacy of similar products not mentioned. Do not use any of the products unless registered for the given crop in the state. ■

References

Davis M. R., Pernenzky, K., and Broome, C. J. *Tomato Health Management*. St. Paul, MN: APS Press, 2012.

Egel D., Foster, R., Maynard, E., Weinzierl, R., Babadoost, M., O'Malley, P., Nair, A., Cloyd, R., Rivard, C., Kennelly, M., Hutchison, B., Piñero, J., Welty, C., Doohan, D., and Miller, S.. *Midwest Vegetable Production Guide for Commercial Growers 2014*. West Lafayette, IN: Purdue Extension, 2014.

Ingram, M. D., and Stall, R. E. "Gray Mold." In *Compendium of Tomato Diseases and Pests*. 2nd ed., edited by J. B. Jones, T. A. Zitter, M. T. Momol, and S. A. Miller, 30-32. St. Paul, MN: APS Press, 2014.

Table 1

Name of product	Common name	Efficacy rating	REI /PHI	Rate	Comments
Endura®	boscalid	Very Good	3/0	9-12 oz./A, 3.5 oz./A on fruits	Restricted use fungicide. Increase spray volumes as plants grow. Suppression only on fruits. <u>Not for greenhouse use.</u>
Botran®	2,6-dichloro-4-nitroaniline	Good	12/10	16 oz/100 gal. @ 20-100 gal./A	Very effective for the stem phase up to a height of 24 inches. Greenhouse use allowed.
Fontelis®	penthiopyrad	Good	12/0	10-24 fl. oz./A	See label for greenhouse use. Greenhouse rate is 0.5-0.75 fl. oz./ 1360 sq. ft.
Scala®	pyrimethanil	Good	12/0	7 fl. oz./A	Can be used in greenhouses; see label for cautions.
Switch®	cyprodinil, fludioxonil	Good	12/0	11-14 oz./A	Do <u>not</u> apply to cherry or grape tomatoes in a greenhouse.
Bravo®, Equus®	chlorothalonil	Fair	12/0	2.0 lb/A	Field use only. (In Missouri, a high tunnel with open sides is considered to be a field.)
Cabrio®	pyraclostrobin	Fair	12/0	8-16 oz./A	Suppression only.