



## DOWNY MILDEW OF BASIL

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Basil downy mildew is a new, destructive disease in the United States and has been confirmed in more than 30 states since it was first found in Florida in 2007. All cultivars of sweet basil (*Ocimum basilicum*) are susceptible to the disease. Downy mildew can cause leaf discoloration, distortion, and necrosis, which may result in quality and yield reductions, or even complete yield losses of field- and greenhouse-grown basil crops, as well as in home gardens.

### SYMPTOMS AND DIAGNOSTICS

The initial symptoms of basil downy mildew are yellowing and chlorosis of leaves (Figure 1), which can be mistaken for a nutrient problem. As symptoms develop, yellow patches are restricted by large veins and a grayish-purple fuzzy growth



Figure 1. Yellowing of affected basil leaves.

(sporangiophores and sporangia) may be visible on the lower surface of infected leaves in humid and wet conditions (Figure 2). This distinguishing characteristic is often more noticeable in the morning. As the disease progresses, infected leaves turn brown and scorched (Figure 3).

### DISEASE DEVELOPMENT

Basil downy mildew is caused by a fungus-like organism, *Peronospora belbahrii*. The pathogen cannot survive winters in Connecticut. However, in warm areas where basil can grow year-round, it can survive on living hosts from year to year. Airborne sporangia formed on the infected leaves can be dispersed long distances via wind. The pathogen can also be transmitted through contaminated seeds and infected plant materials. Spore germination and infection



Figure 2. Dark gray mildew on the lower surface of infected leaves.



Figure 3. Leaf scorch caused by basil downy mildew.

require at least 85% relative humidity or free water on leaf surfaces. So, high humidity, mild temperature, poor air circulation, and extended periods of leaf wetness are favorable for disease development.

## MANAGEMENT

*Resistant varieties and species:* Some varieties in *O. basilicum* are less susceptible to downy mildew, such as ‘Cinnamon’, ‘Red Rubin’, ‘Red Leaf’, and ‘Mr. Burn’s Lemon’. Lemon and spice type basil (*O. × citriodorum* and *O. americanum*) are moderately resistant to the disease, such as ‘Lemon Std’, ‘Lemon’, ‘Lime’, ‘Spice’, ‘Blue Spice’, and ‘Blue Spice Fil’.

*Disease-free seeds and transplants:* Purchase disease-free or steam-treated seeds from certified and reliable suppliers. Before purchasing seedlings, check for any suspicious symptoms on plants especially on the plants from the south where the disease occurs earlier.

*Cultural practices:* Minimize leaf wetness and reduce humidity by using drip irrigation, watering plants in the morning, increasing plant spacing, and providing good air movement between plants. For growing basil in outdoor containers, plants can be

brought inside when humidity is high (overnight and on rainy days) to reduce favorable conditions needed for spore germination and infection. Scout for the disease and destroy infected plants when they are found in the early season. When basil downy mildew is detected in nearby areas, harvesting basil crops early before they are damaged by the disease may prevent economic losses.

*Fungicide application:* Among the fungicides registered for use in Connecticut are phosphorus acid (Fosphite and Alude) and potassium bicarbonate (Armcarb O and Milstop). *Streptomyces lydicus* (Actinovate AG), *Bacillus amyloliquefaciens* (Double Nickel 55), extract of *Reynoutria sachalinensis* (Regalia), neem oil (Trilogy), and hydrogen dioxide (OxiDate) are OMRI-approved for organic production. Fungicide applications can protect plants from infection, but are unlikely to cure infected plants. Fungicide labels are legal documents, so be sure to read and follow label instructions.

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