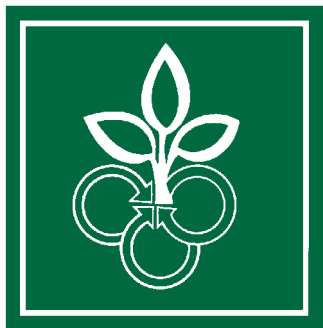


Vegetable Diseases

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Downy Mildew of Pumpkin

Dan Egel

Extension Plant Pathologist, Southwest Purdue Agricultural Center
(812) 886-0198 egel@purdue.edu

The fungus that causes downy mildew of pumpkin (*Pseudoperonospora cubensis*) affects other cucurbits, including cucumber, gourd, muskmelon, squash, watermelon, and zucchini.

In Indiana, however, pumpkins are the most likely crop to suffer yield damage from this disease. That's because pumpkins are grown late in the season and the fungus is more likely to arrive in August and September than earlier in the season.

Disease Cycle and Symptoms

This late timing is due to downy mildew's disease cycle. The fungus does not survive Indiana winters because it requires green, living plant tissues. That means the fungus generally overwinters in the southeastern United States. The wind carries downy mildew spores to new, living hosts, but, depending on conditions, it can be quite late in the growing season before the spores reach Indiana.

On pumpkin, downy mildew causes angular yellow lesions on leaves, which may coalesce and turn brown (Figure 1). On wet mornings or after a rain, the downy



Figure 1. Angular yellow lesions on the upper leaf are often the first observed symptom of downy mildew. Here, lesions are clustered around a vein because this area accumulates moisture.

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mildew lesions on the undersides of the leaves may be covered with spores that appear as a dark fuzz (Figure 2). The wind can spread the spores easily to other leaves, plants, and fields. The fungus can spread rapidly and affect large areas of a field when conditions are favorable — 100 percent humidity for at least six hours with temperatures between 59°F and 68°F (Figure 3).



Figure 2. The circled areas are the undersides of lesions like those shown in Figure 1. The fuzzy areas are the spores of the fungus that cause downy mildew. This photograph was taken in the morning when the leaf was still moist with dew.



Figure 3. When moisture and temperature are conducive, downy mildew will quickly spread within a field and to other fields. Leaf lesions will become numerous, coalesce, and turn brown. Leaf edges may turn up, making the plants appear scorched.

Early Detection and Management Critical

Downy mildew can turn pumpkin leaves brown, reducing the effective leaf surface. This loss of leaf surface can affect the yield, size, and quality of the fruit. So, it is critical to apply control measures at the earliest threat of disease.

Because the downy mildew fungus cannot overwinter in soil or crop residue, crop rotation and fall tillage will not affect this disease (although such practices are important for other diseases). Instead, during the growing season, growers should pay attention to downy mildew forecasts, the *Vegetable Crops Hotline* www.entm.purdue.edu/Entomology/vegsite/commercial/hotline2007.html, and newsletters from neighboring states. Growers also should learn to identify the disease and scout their fields regularly.

Once downy mildew has been detected, apply the appropriate fungicides as soon as possible. Contact fungicides effective against downy mildew include formulations of chlorothalonil (Bravo®, Echo®, Equus®) and maneb (Maneb®, Manex®).

The systemic fungicides effective against downy mildew include: cymoxanil/famoxadone (Tanos®), dimethomorph (Acrobat®), cymoxanil (Curzate®), propamocarb (Previcur Flex®), cyazofamid (Ranman®). These fungicides are specialized and, with the possible exception of *Phytophthora* blight, will not be effective against other pumpkin diseases.

Because systemic fungicides are expensive and the presence of downy mildew uncertain, some growers may prefer to apply contact fungicides weekly starting the first week of August.

Find Out More

For more information on fungicide resistance strategies, rates, and cautions, see Purdue Extension publication ID-56, the *Midwest Vegetable Production Guide for Commercial Growers*, available at www.btny.purdue.edu/pubs/ID/ID-56/ or by visiting the Purdue Extension Education Store at www.ces.purdue.edu/new.

