LOUISIANA PLANT PATHOLOGY
DISEASE IDENTIFICATION AND MANAGEMENT SERIES
LSU AgCenter Research & Extension

Downy Mildew of Cucurbits

Pseudoperonospora cubensis (Berk. & M.A. Curtis) Rostovzev

Downy mildew, caused by the water mold *Pseudoperonospora cubensis,* is a potentially devastating disease of all cucurbits. Although it rarely attacks the fruit directly, it can reduce yields substantially by destroying the leaf canopy, thereby reducing plant growth and exposing the fruit to sunburn. This pathogen is an obligate parasite and survives only within living cucurbits, so disease develops only after the pathogen has been introduced into the area either as windborne sporangia (the dispersal structures) or within infected transplants. Because this disease can develop extremely rapidly, it is vitally important that fields be monitored on a regular basis to detect disease when it first appears.

The first symptom of disease is the appearance of small yellow spots (lesions) on the upper surface of older leaves; however, similar symptoms soon appear on younger leaves as well (Fig. 1). Brown, necrotic areas often develop within these lesions as they expand. On most cucurbits, the lesion margins tend to be irregular; however, on cucumbers the lesions appear more angular because pathogen growth is restricted by the veins of the leaves (Fig. 2). On watermelons, the dry, brown-to-black necrotic tissues develop quite rapidly, and lesions merge to kill large areas of the leaves (Fig. 3), which then tend to curl noticeably upward from the margins (Fig. 4). During periods of high humidity (> 90% R.H.), sporangia are formed on the lower surface of the lesions and are visible as the downy, gray growth that gives the disease its name (Fig. 5).

Figure 1. Early symptoms of downy mildew on pumpkin.

Figure 2. Downy mildew on cucumber

Disease develops quite rapidly when environmental conditions are suitable (that is, when nighttime temperatures that range from 55 to 75 degrees are accompanied by prolonged periods of high humidity). The sporangia produced on the lower surface of the leaves are spread primarily by air movement and germinate rapidly when leaves are wet from either rainfall or dew. Under optimal conditions, the pathogen can complete its life cycle in as few as four days, although typically it takes from four to 12 days. Five pathotypes of *P. cubensis* are currently recognized, all of which attack cucumbers and netted melons, whereas only two attack watermelons.

Disease control relies primarily on the use of fungicides since resistant varieties are available only for cucumbers and some melons (but not watermelons). Fungicides are most effective when they are applied before the onset of disease, and they must be applied repeatedly as long as environmental conditions are suitable for disease development. Because this pathogen can develop resistance to fungicides quite readily, it is important to follow label instructions regarding their use. For information on fungicides for managing this disease, see the Louisiana Plant Disease Management Guide, LSU AgCenter Publication No. 1802, or visit our Web site www.lsuagcenter.com.

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Figure 3. Advanced symptoms of downy mildew on watermelon.

Figure 4. Upward curling of downy mildew-infected watermelon leaves.

Figure 5. Down mildew sporulating on the underside of a pumpkin leaf.