

Powdery Mildew of Cucurbits

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Powdery mildew affects all cucurbits, but most often damages cantaloupes, squash, and pumpkins. Two different fungi, *Erysiphe cichoracearum* and *Sphaerotheca fuliginea*, can cause powdery mildew on cucurbits. Both fungi grow as a white, powdery mass on leaves, petioles, and stems. The resulting decrease in photosynthesis may cause significant reductions in the quality and yield of fruit.

Symptoms

Powdery mildew appears on leaves, petioles, and young stems as a white powdery mass composed of mycelium and countless numbers of spores (Fig.1-2). Under favorable environmental conditions the entire top surface of the leaf may be covered with the powdery fungus and an entire field may appear to turn white within a few days. Infections may also occur on lower leaf surfaces. Badly infected leaves become yellow, turn brown, and shrivel.

Cucurbit fruits are not directly attacked by powdery mildew fungi; however, they may be malformed or sun-

burned due to loss of foliage cover. In severe infections both the size and number of fruit may be reduced.

Disease Cycle

Initial inoculum may come from old cucurbit debris left in the field or it may be blown in on air currents from infested areas south of Virginia. In contrast to downy mildew, which is more severe during wet weather, powdery mildew is actually inhibited by free moisture on leaf surfaces. High humidity is, however, required for spore germination. The optimum temperature for disease development is 20-27°C (68°-81°F). Dense plant growth, low light intensity, and high fertility favor disease.

Control

Cultural Control

- Remove plant debris at the end of the season to reduce overwintering of the fungus.
- Avoid crowding plants.
- Avoid excess nitrogen fertilization.



Fig. 1. Typical symptoms of powdery mildew on a pumpkin leaf. (Photo by P. Sforza)



Fig.2. Close-up of powdery mildew on pumpkin leaf. (Photo by P. Sforza)

Chemical Control

- The fungicide, chlorothalonil (e.g. Daconil 2787), can be used on a preventative basis in home gardens. Sprays should begin at the first sign of disease and continue every 7-10 days thereafter.
- In commercial fields, the fungicides, trifloxystrobin (e.g. Flint) and azoxystrobin (e.g. Quadris), can be rotated with chlorothalonil (e.g. Bravo, Terranil) every 7 days. The former fungicides have a highly specific mode of action and can induce the development of resistance in the fungal population if they are not rotated with a fungicide that has a more general mode of action, such as chlorothalonil. Another option is to rotate trifloxystrobin or azoxystrobin with chlorothalonil + myclobutanil (e.g. Nova) every 7 days. Myclobutanil was recently registered for use in cucurbits and has a different mode of action than trifloxystrobin or azoxystrobin. Refer to the current issue of the Virginia Pest Management Guide for Home Grounds and Animals (VCE Publication 456-018) or the Commercial Vegetable Production Recommendations (VCE Publication 456-420) for details on fungicide control.

Resistance

- Several cultivars of pumpkin have moderate to excellent resistance to powdery mildew. Many cultivars of cucumbers and cantaloupes with excellent resistance to powdery mildew are also available. See Table 1.

Table 1.

Cucurbit cultivars with resistance to powdery mildew

Cucumbers		
Pickling	Slicers	Burpless Slicers
Calypso-F1 ¹	Dasher II-F1	Burpless 26-F1
Carolina-F1	Daytona-F1	Green Dragon
Conquest-F1	Fanfare-F1	Burpless
Eureka-F1	Indy-F1	
Fancipak M-F1	Lightning-F1	Sweet Slice-F1
Lucky Strike-F1	Seneca Longbow-F1	Orient Express-F1
SMR58	Speedway-F1	
Wellington-F1	Thunder-F1	
	Turbo-F1	

Cantaloupe	Pumpkin	Squash
All Star	Big Moon (R) ²	Patriot II
Ambrosia	Jack-Be-Little (R)	
Athena	Magic Lantern (MR)	
Cordele	Merlin (MR)	
Laguna	Mystic (MR)	
Morning Dew		
San Juan		

¹ Note: F1 refers to the hybrid generation produced by a cross of two inbred lines. Seed from these plants will not produce plants that are true to type and should not be saved for future plantings.

² MR = moderately resistant; R = resistant

Refer to the current Virginia Pest Management Guide for Home Grounds and Animals (VCE Publication 456-018), <http://pubs.ext.vt.edu/456-018/>, for details on the proper use of pesticides.

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