

Downy Mildew

Downy mildews are challenging to control because they are caused by pathogens called oomycetes, which are more closely related to algae than fungi. Adding another layer of complexity, many downy mildew pathogens are host-specific, meaning that the downy mildews that affect roses, rudbeckia, impatiens, and buddleia are each unique and distinct from each other.

Biology

Downy mildew thrives in cool, humid environments (>85% humidity, 55-75°F), making greenhouse conditions favorable for its development. The pathogen's life cycle involves the production of spores, specifically sporangia, which are dispersed by wind, water splash, or human activities like pruning, spacing, and movement of tools. Once the sporangia land on a suitable host plant, they germinate under high humidity or when free moisture is present.

Common symptoms include yellow to pale green spots or blocky purplish spots on the upper leaf surfaces and a fuzzy, grayish-white growth on the undersides of leaves. As the disease progresses, leaves may become necrotic, curl, or drop prematurely, leading to defoliation.



Figure 1. Downy mildew symptoms on rose. Jean L. Williams-Woodward, University of Georgia, Bugwood.org



Figure 2. Downy mildew sporulation on impatiens. Mary Ann Hansen, Virginia Polytechnic Institute and State University, Bugwood.org

Cultural Practices

Successful downy mildew management requires an integrated approach with emphasis on cultural controls:

- Reduce humidity levels by improving ventilation and spacing plants to enhance air circulation.
- Avoid overhead irrigation, which creates favorable conditions for spore dispersal and germination.
- Remove and destroy infected plant material promptly to limit the pathogen's spread.
- Disinfect tools, pots, and greenhouse surfaces regularly.
- When available, select plant varieties with documented resistance to downy mildew pathogens.

Chemical Strategies

Even with strong cultural practices, fungicides play a critical role in managing downy mildew, especially in high-value ornamental crops. Effective fungicide programs involve alternating products with different modes of action to prevent the development of resistance.

Atticus Products for Effective Management of Downy Mildew				
Atticus Brand	Active Ingredient	REI (hours)	Activity	FRAC Group
Artavia™ 2 SC	Azoxystrobin	4	Translaminar, systemic	12
Celoxid™ SC	Cyazofamid	12	Contact	21
Stergo™ MX	Mefenoxam	48; 0 as a drench	Systemic	4