

FACT SHEET

Downy Mildew in Onions

Downy mildew is a plant disease, caused by a fungal-like water mould known as *Peronospora destructor*. The disease thrives in cool, wet conditions and can cause significant yield and quality losses if not managed.

Early symptoms include pale yellow patches on leaves, followed by the development of greyish-purple spores under moist conditions. When spores occur, the disease can quickly spread through the crop. Initial sources of the pathogen can include infected bulbs, seeds, and plant debris. Onions are most susceptible to downy mildew during the early vegetative growth and seedling stages.

What to look out for

1. Initial infection



- Masses of grey spores with a fuzzy appearance on leaves
- Spores turn purple as the disease develops

2. Leaf necrosis



- Yellow oval shaped patches on the middle section of the leaf
- Patches turn brown as the fungus develops, affected leaves are often colonised by *Alternaria* or *Stemphylium* confusing diagnosis
- Lesions develop a fuzzy grey appearance

3. Leaf collapse



- Dead sections of leaves develop purple blotches
- Heavily infected leaves collapse

Factors affecting development and impact of downy mildew



Amount of downy mildew inoculum and other disease pressure



Poor nutrient management (especially excess nitrogen)



Lack of rotation with non-host crops



Poor irrigation management



Overnight temperatures of 4-25°C (13°C optimal)



Plant spacing and direction



Tolerance of onion variety



Farm hygiene



High humidity



Use of farm & weather monitoring tools

All photos: Mary Hausbeck, Michigan State University

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Management of downy mildew

Before planting



Crop rotation

Method: Rotation lengths of four to five years between *Allium* crops is considered good practice in reducing downy mildew incidence.



Forecasting and monitoring

Method: Forecasting models for downy mildew are available to help time the application of systemic fungicides. Effective monitoring for downy mildew requires an understanding of the conditions that favor its growth. For instance, downy mildew thrives in susceptible white skin onion varieties, in low-lying areas with poor air circulation, and on the eastern side of crops that receive morning shade. Implementing a targeted scouting program is crucial for detecting pests and diseases, especially during climatic conditions conducive to infection (humid, cloudy, and wet periods). This helps identify symptoms early and manage the disease effectively.



Farm hygiene

Method: Removal and destruction of infected plant debris, including onions and weeds is important to reduce the source of inoculum.



Plant spacing and direction

Method: It is important to plant at the recommended spacing to ensure good air circulation between plants, which can reduce humidity and minimise the spread of disease. To minimise humidity in the canopy, planting should be in the direction of prevailing winds.

In crop



Irrigation management and drainage

Method: It is important to allow foliage to dry between irrigations. Downy mildew needs 4-10 hours of leaf wetness to infect onion leaves. Avoid soils that easily become waterlogged.



Fungicides

Method: It is important to regularly apply protective fungicides labelled for downy mildew control before any sign of disease occurs. Copper and Mancozeb formulations offer limited control once infection has occurred. Curative, systemic products must be applied at the very first sign of disease.

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