



Extension FactSheet

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Downy Mildew of Crucifers

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Downy mildew affects all cultivated plants and weeds in the crucifer family. It can be a serious problem in commercial production of cabbage, broccoli, cauliflower, radish, turnip, mustard, collard, and cruciferous greens. Under favorable conditions, it may cause serious losses in the field or may develop after harvest and cause deterioration of product quality during packing and shipping.

Symptoms

Plants can be infected at any stage of development. In seed beds, cotyledons and primary leaves are invaded resulting in fungal growth visible on the underside of the leaf. Later a slight yellowing develops opposite the fungal growth on the upper side of the leaf. The young leaf or cotyledon, when yellow, may drop off. Older leaves usually persist and infected areas gradually enlarge, turn bright yellow (Figure 1), then become tan and papery. Rarely the affected leaf may develop hundreds of minute darkened specks. Under cool, moist conditions, a white mildew growth can be seen on the underside of infected leaf lesions (Figure 2).



Figure 1. Bright yellow downy mildew lesions on the upper surface of a diseased turnip leaf.



Figure 2. Underside of diseased turnip leaf showing white mildew growth.

Symptoms may appear on other plant parts as well. The fleshy roots of turnips and radishes may develop an internal, irregularly shaped discoloration extending from the crown downward. The flesh may be brown or black or show a form of net necrosis. In advanced stages, the skin becomes roughened by minute cracks and the root may split open. In radish these symptoms may be confused with those caused by *Rhizoctonia*.

Causal Organism

The fungus causing downy mildew in crucifers, *Peronospora parasitica*, overwinters in roots or in decaying portions of diseased plants. Thick-walled resting spores may form in stems, cotyledons, and other fleshy parts of infected host plants. On growing plants, the fungus produces large numbers of spores that are blown about by wind and splashed by rain. Moisture and temperature are important in the spread and reproduction of this fungus. High relative humidity during cool or warm, but not hot, periods promotes its growth and sporulation. Presence of a water film on the foliage from fog, drizzling rain, or dew allows spores to germinate, infect, and produce more spores on a susceptible host in as few as 4 days.

Management

1. Use a crop rotation plan that excludes production of any type of cruciferous crop for at least 2 out of every 3 years.
2. Practice sanitary measures such as the use of clean seed beds away from other crucifer production and the destruction of cruciferous weeds.
3. Use a planting site and plant spacing pattern that expose plants to full sun throughout the day.
4. If severe disease pressure is expected, apply a registered fungicide weekly beginning soon after emergence. Consult the Ohio Vegetable Production Guide (OSU Extension Bulletin No. 672) for current fungicide recommendations.
5. Disease resistant cultivars are not available for most cruciferous crops. However, some hybrid cultivars of broccoli are resistant or tolerant to downy mildew. Consult the Ohio Vegetable Production Guide (OSU Extension Bulletin No. 672) for a list of resistant broccoli cultivars.

This publication contains pesticide recommendations that are subject to change at any time. These recommendations are provided only as a guide. It is always the pesticide applicator's responsibility, by law, to read and follow all current label directions for the specific pesticide being used. Due to constantly changing labels and product registration, some of the recommendations given in this writing may no longer be legal by the time you read them. If any information in these recommendations disagrees with the label, the recommendation must be disregarded. No endorsement is intended for products mentioned, nor is criticism meant for products not mentioned. The author, The Ohio State University and Ohio State University Extension assume no liability resulting from the use of these recommendations.

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