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).

**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.

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