



Downy Mildew

Downy mildew is the common name for a group of highly specialized obligate parasites of vascular plants.

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These organisms are distinctly different from the powdery mildews. Although they have traditionally been included taxonomically with true fungi, these organisms and their relatives in the genera *Phytophthora* and *Pythium* and others in the Oomycota are now not believed to be closely related to true fungi. Morphologically, they are similar to fungi and have

absorptive nutrition. The chemicals used to control downy mildews are similar to those used for *Pythium* and *Phytophthora* and different from most of those used for true fungi.

Symptoms

Downy mildew colonies often appear first on the underside of leaves, and they sometimes have a bluish tinge (1; 3). In many cases, they can grow systemically throughout the plant. If growing abundantly on a leaf, downy mildew colonies can be confused with gray mold (*Botrytis*) or with powdery mildew. Microscopically, they are very easy to tell apart from powdery mildew and *Botrytis*. On the foliage,

small yellow spots develop on the upper sides of the leaf while white to bluish-white fluffy growth forms on the underside of the leaf. As the leaf spot dies, the fluffy growth darkens to gray in color. Infected leaves and branches may be distorted and die.

Life history

Downy mildews are generally favored by cool temperatures (15-23° C = 58-72° F) and relative humidity above 85% at the leaf surface. While some downy mildews survive from year to year locally in plant debris, in the soil, or on weeds, others do not survive in cold climates and must be blown back to our region from southern climates each spring. Species of downy mildews reproduce sexually via oogonia and antheridia and asexually via sporangia. From the time of infection until new spores form can be as short as 4 days but is usually 7-10 days. In all species, the sporangia germinate directly by forming a germ tube that penetrates the plant. In some species (*Sclerospora* and *Plasmopara*), sporangia can also germinate 'indirectly' by releasing zoospores. *Peronospora*, *Pseudoperonospora*, and *Bremia* rarely if ever form zoospores.



Downy mildew on underside of leaf. Note grayish-blue color.



Downy mildew on *Rudbeckia*. White color could be confused



White Downy mildew branch with spore attached.

Management

Plant debris should be removed from the area around the plant and buried, burned, or placed in a closed container. Plants should be spaced to ensure good air circulation around them so that when irrigated or subject to rainfall, leaf surfaces dry quickly. Overhead irrigation should not be used when the weather is generally cool. **It is important, during cool damp weather in the spring, to scout highly susceptible plants** in order to detect first infections. In particular, roses, pansy and impatiens should be monitored carefully. Contact Cooperative for information concerning the fungicides that are available to control downy mildews to protect plants during cool, damp weather.

Literature Cited

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