Pest e-alerts

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Downy Mildew on Basil

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Basil is a popular herb grown for fresh market. Downy mildew, caused by the fungus *Peronospora*, is a new disease of basil that was first found in the United States in Florida in 2007. The disease became widespread in the U.S. in 2008 and 2009. Dr. Niels Maness in the Horticulture and Landscape Architecture Department is working on maintaining flavor in dried basil and has had variety trials at the OSU Vegetable Research Station for the last several years. These plots have been monitored periodically for the presence of the disease in 2009 and 2010. Downy mildew was found for the first time at Bixby last week where it reached severe levels on susceptible varieties.

Fig 1.

Symptoms of downy mildew are a subtle yellowing of the foliage that may be mistaken for nutritional deficiency or another physiological problem. The yellowing first appears as angular areas defined by leaf veins (Figure 1). The downy mildew fungus can be observed as a whitish colored moldy growth on the lower surface of affected leaves that can be best seen through a hand lens. The moldy growth, reproductive structures of the fungus, consists of grape-like clusters of brownish colored spores produced on white fungal branches. Diseased areas of affected leaves die and turn brown (Figure 2). Fungal sporulation may become extensive and easily visible with the naked eye as a bluish-gray moldy growth as the disease becomes severe (Figure 3). Susceptible varieties had about 50% of the leaves affected and about 25% leaf defoliation.

Fig 2. Diseased areas of affected leaves die and turn brown.

Fig 3. Fungal sporulation is easily visible with the naked eye as a bluish-gray moldy growth.

Little is known about the biology of this downy mildew disease. Sources of the fungus spores for disease outbreaks are contaminated seed, diseased herb and ornamental basil plants, and fresh basil leaves in the market. The importance of diseased seed in the spread of downy mildew is mostly speculative. Disease plants in the field and greenhouse are likely to be the most important sources of spores. Spores survive long distance transport in air currents under cloudy conditions and can be washed out and deposited back to the ground with rain. Some downy mildews form resistant survival spores (oospores) that can survive in the absence of a living host plant. Oospore formation in the basil downy mildew has not been reported. It is therefore unlikely that the disease will persist in field plantings from year to year.

Of the basil varieties planted in the trial, 'Genovese', 'Napolitano', 'Cinnamon', and 'Sweet Thai' were susceptible having disease levels of 30 to 50%. The varieties 'Mrs. Burns Lemon', 'Blue Spice', 'Turkish' (a purple colored basil), and 'Ethiopian' were resistant with little if any downy mildew on the foliage. 'Genovese', 'Napolitano', and 'Turkish' are sweet or pesto-type basils; 'Mrs. Burns Lemon' is a citrus-type basil; and 'Cinnamon', 'Sweet Thai', 'Blue Spice', and 'Ethiopian' are spicy-type basils.

Control of downy mildew on susceptible basil varieties will require fungicide sprays. Spray programs will be most effective when started preventively or soon after the first appearance of disease. There are few fungicides registered for use on herbs. Those with activity on downy mildew and have performed well in trials conducted in other states are azoxystrobin (Quadris) and various phosphorous acid formulations (Fosphite, Fungi-Phite, KPhite, Phostrol, ProPhyt, and Rampart. Alternating sprays of azoxystrobin with phosphorous acid is recommended to help prevent resistance development. Most downy mildew diseases are sporadic here in Oklahoma and tend to occur late in the season when temperatures cool off and dews are more frequent. It is unknown whether or not this disease will become a chronic problem. For farmer's market growers and gardeners, growing one of the resistant types may be the best option because fungicides registered for use on herbs are not effective in small quantities.

For more information on basil downy mildew, Dr. Meg McGrath at Cornell University has basil downy mildew web sites with excellent pictures at:

http://vegetablemdonline.ppath.cornell.edu/NewsArticles/BasilDowny.html#Report

http://www.longislandhort.cornell.edu/vegpath/photos/downymildew_basil.htm

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