



FUSARIUM WILT OF BASIL

Fusarium wilt, caused by the fungus *Fusarium oxysporum* f. sp. *basilici*, is a common disease of basil, especially on sweet basil (*Ocimum bacilicum*). This disease has been reported from basil growing areas throughout the world. It is a serious disease in Illinois. Fusarium wilt occurs in the field, greenhouse, and hydroponic production and pathogen is primarily introduced to the production sites by infected seed.

SYMPTOMS

Symptoms of Fusarium wilt include wilt of foliage (Figure 1), chlorosis and necrosis of leaves and apices, growth retardation, asymmetric growth, dark discoloration streaks on stems (Figure 2) and petioles, and stem necrosis, vascular discoloration, root rot, and plant death (Figure 1). The fungus invades the water-conducting tissue (xylem) within the stem and block translocation of water and nutrients to foliage. Infected basil plants usually grow normally until they are six to twelve inches tall, then become stunted and exhibit browning of terminal growth. Once water uptake is totally blocked, the plant suddenly wilt.



Figure 1. *Fusarium* wilt of basil. (Photo courtesy Debbie Roos, North Carolina State University).

DISEASE CYCLES

Fusarium oxysporum f. sp. *basilici* is a soilborne fungus. The pathogen may be introduced into the field or spread by contaminated seeds or movement of soil where infected plants have been growing. Once established, the fungus can overwinter and survive in the field for many years as spores and cause new infections if basil or other members of the mint family are planted. Disease favors warm, wet conditions.

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DISEASE MANAGEMENT

The following practices are recommended for management of Fusarium wilt of basil.

- The disease is introduced into fields, hydroponic systems, and greenhouse culture primarily through contaminated seed. Growers should only buy basil seeds that has been tested for the Fusarium wilt fungus. Currently, the test involves growing out a large number of seeds and looking for disease symptoms. This does not guarantee that the seeds will be free of infection, but it greatly reduces the risk.

- Three “Genovese-type” sweet basils resistant to Fusarium wilt: ‘Nufar’, ‘Aroma 1’, and ‘Aroma 2’. While these cultivars are resistant to Fusarium wilt, they are highly susceptible to basil downy mildew, another devastating basil disease.



Figure 2. Fusarium wilt of basil. Note brown streaks and spots along stems (Photo courtesy Missouri Botanical Garden).

- High ammonium-nitrogen fertility appears to promote development of the disease while nitrate-nitrogen may reduce its development.
- There is no cure for basil Fusarium wilt once symptoms are apparent. Always infected plants should be removed immediately - sporulation on the surface of the dead stem areas can otherwise be splashed to nearby plants or even become airborne.
- Disinfestation of greenhouse benches and hydroponic equipment between crops or immediately after an outbreak is necessary.
- Once a field has become infested with the Fusarium wilt pathogen, infective propagules may persist in the soil for several years. Crop rotations for 3 year or longer with crops other than members of mint family can be considered. Mints will not exhibit symptoms of the disease but may carry over the inoculum from year to year.
- There are currently no products registered for control of Fusarium wilt of basil.