

BLACK LEG OF BRACCICAS

Black leg, caused by the fungus *Phoma lingam*, is an important disease of brassica crops. Perfect (sexual) state of this fungus is *Leptosphaeria maculans*. Black leg occurs worldwide and is more serious disease in temperate regions and tropical areas. The disease is also known as Phoma stem canker. *P. lingam* is a seedborne pathogen.

Symptoms

Infection of cotyledons and the first true leaves occurs. The pathogen also causes damping-off at the seedling stage. On leaves, yellow lesions develop, which are round or irregular shaped, confined by leaf veins. As the lesions get older, they become necrotic and grayish in color, often with a darker margin (Figure 1). In cabbage, black leg symptoms can be found on both leaves and stems (Figure 2). Pycnidia (asexual fruiting structures) of the pathogen can be observed as pinpoint black dots in the center of the lesions. Pycnidia exude a pink spore mass (conidia) under moist and warm conditions (Figure 3).



Figure 1. Cauliflower plants with black leg disease (Courtesy APS, R. H. Morrison).

In the seed brassicas, typical Phoma stem canker symptoms develop after flowering. Oval lesions are visible around leaf scars, either with a grayish center and a black margin or with transverse, black streaks. Often, the xylem is blackened, sometimes with very little external symptoms. Advanced symptoms show brown to gray discoloration of the stem base.

Disease cycle

The pathogen may survive for years as dormant mycelia in infected seeds. Usually, seeds are contaminated rather than infected. In vegetable brassicas, infection of new plants is mostly associated with seedborne inoculum and only sometime with the presence of infested crop residue in the seedbed or in the field. Seed infection results in the development of lesions on cotyledons

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and the first true leaves.

In seed crops, survival of the pathogen on black leg-infested crop residue is important. The fungus survives as long as residue survives, for 1-4 years depending on the climate. Pseudothecia (sexual structure) of the pathogen are formed on brassica residues on the soil surface, and the airborne ascospores are dispersed to the crop. Ascospore infection result in local lesions, and then numerous pycnidia (asexual structures) are produced in leaf and stem lesions. Pycnidiospores (asexual spores) are spread to other plant parts and neighboring plants by rain splash.

Disease management

- Plant pathogen-free (certified) seed. Seed treatment in hot-water [50°C (122°F)] for 15-30 min eradicates the pathogen. For examples, 20 min for cabbage and 15 min for mustard green.
- Plant disease-free transplants.
- Avoid planting vegetable brassicas near oilseed rape, as oilseed rape is particularly susceptible to black leg.
- Leave ¼ mile buffer from previously field with black leg disease.
- Practice four-year crop rotation with nonhost crops.
- Plant resistant cultivars, if available.
- Rouge infected plants from seedbeds.
- Control volunteer and wild brassicas.
- Increase spacing between plants to minimize moisture building up.
- Incorporate crop residues into soil after harvesting crop.
- Fungicides Iprodione and Priaxor have been registered for managing black leg in brassicas. Follow label directions. For the up-to-date information on using chemicals for managing black leg of brassicas, refer to the Midwest Vegetable Production Guide for Commercial Growers (<https://mwveguide.org/uploads/pdfs/2022-Midwest-Veg-Guide-8.5-x-11-with-covers-no-bleeds-bookmarked-compressed.pdf>).



Figure 2. A cabbage plant with black leg disease (Courtesy Univ Massachusetts).

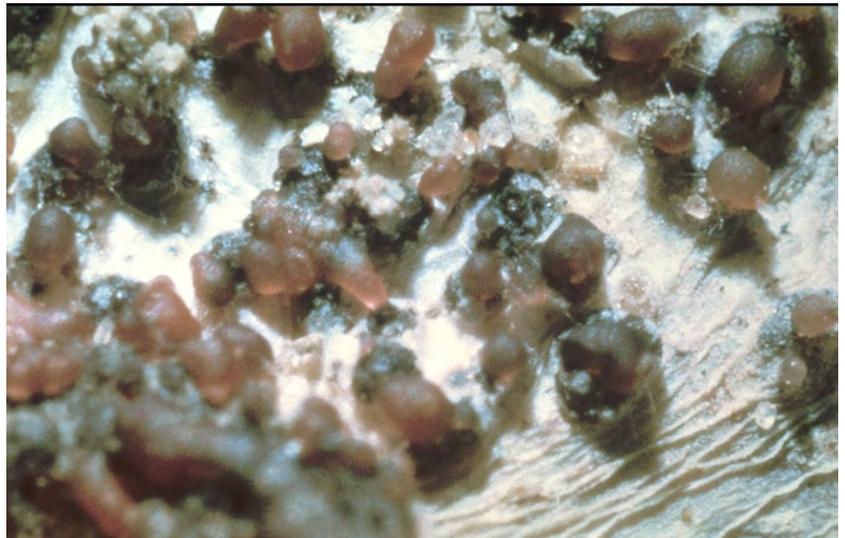


Figure 3. Pycnidia of *Phoma lingam* exuding pink masses of conidia (Courtesy APS, A. F. Sherf).