

BEAN ANTHRACNOSE

Anthracnose, caused by the fungus *Colletotrichum lindemuthianum*, occurs worldwide, but causes more losses in temperate and subtropical zones than the tropics. Bean anthracnose is a seedborne disease. Up to 100% yield losses reported when contaminated seeds were planted and prolonged conditions favorable for disease development occurred during the crop cycle.

Symptoms

Colletotrichum lindemuthianum can infect all parts of bean plant. Infected cotyledons exhibit small, dark brown to black lesions. Infected tissues of hypocotyl develop minute, rust-colored specks that enlarge longitudinally to form sunken lesions. These may cause a rotting of the hypocotyl. On older stems, lesions may reach 5-7 mm in length.

Lesions are more common on leaf petioles and on lower surfaces of leaves and leaf veins. They are elongate, angular, and brick red to purple, becoming dark brown to black. Lesions may also

appear on the upper surfaces of leaves (Figure 1).



Figure 2. Anthracnose, caused by *Colletotrichum lindemuthianum* on bean pods. (Courtesy APS, H. F. Schwartz).

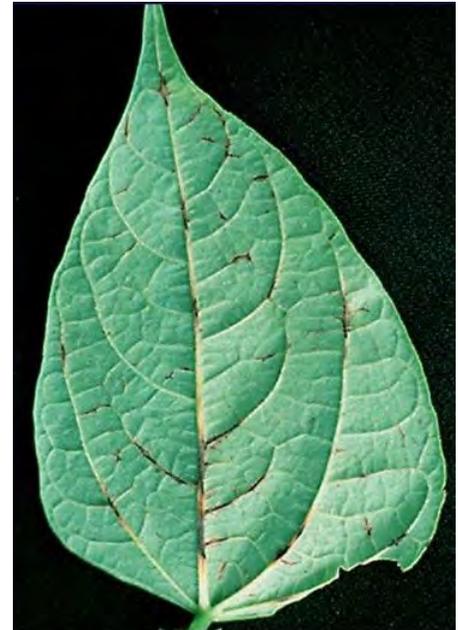


Figure 1. Anthracnose, caused by *Colletotrichum lindemuthianum* on a bean leaf. (Courtesy APS, H. F. Schwartz).

Pod infections appear as tan to rust-colored lesions that develop into sunken cankers (1-10 mm in diameter), with slightly raised black ring surrounded by a reddish brown boarder (Figure 2). Young pods may shrivel and dry if severely infected. The fungus can invade seed coat of developing seed. Infected seeds are often discolored and may contain dark brown to black cankers (Figure 3).

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The centers of lesions caused by *C. lindemuthianum* on bean plants are light colored, and during periods of low temperature and high moisture may contain a gelatinous mass of tan conidia (asexual spores of the pathogen) that dry to gray-brown or black granules.

Disease Cycle

The pathogen survives between crops in crop residue and can be disseminated in seed, air, and water. Under favorable environmental conditions, conidia can germinate in 6-9 hours and infect plant. The pathogen produces acervuli (asexual fruiting structures) within the lesion site, which produce conidia. Produced conidia in acervuli serve as the secondary inoculum.

Plant infection and conidial production are favored by temperatures of 55-79°F (13-26°C), with an optimum of 63°F (17°C). Relative humidity of greater than 92% (or free moisture) is required during all stages of conidium germination, infection, and subsequent sporulation. Moderate rainfalls at frequent intervals, particularly if accompanied by wind or splashing rain, are favorable conditions for local dissemination of conidia and development of epidemic.



Figure 3. Anthracnose, caused by Colletotrichum lindemuthianum on bean seeds (right). Uninfected seeds (left). (Courtesy APS, R. Hall).

Disease Management

- Depending on the pathogen race, resistant cultivars to *C. lindemuthianum* are available.
- Plant pathogen-free seed. Seeds produced in dry growing season and certified are recommended. Also, seedborne inoculum can be eradicated by seed treatment with effective fungicides.
- Crop rotation of with nonhost crops (i.e., cereals) for 3 years is recommended.
- Tillage for rapid breakdown crop tissues is an important method to prevent inoculum buildup.
- Bean anthracnose can be managed by fungicide applications. For up-to-date information on using fungicides for control of bean anthracnose, refer to the “Midwest Vegetable Production Guide for Commercial Growers.”