

BEAN COMMON BACTERIAL BLIGHT

Common bacterial blight, caused by *Xanthomonas campestris* pv. *phaseoli*, is a major disease of beans worldwide. It affects the foliage and pods of bean plants. During extended warm, humid weather, the disease can be highly destructive, causing losses in both yield and seed quality. The disease develops when contaminated seed with the bacterium is planted, when plantings are made in fields with history of the disease, and when the climate is consistently hot and wet or humid.

Symptoms

Leaf symptoms initially appear as water-soaked spots that gradually enlarge, become flaccid and then necrotic (Figure 1), and are often bordered by a small zone of lemon yellow tissue. Lesions develop at the margin and in interveinal areas of the leaf (Figure 1). As lesions enlarge and coalesce, the plants



Figure 1. Symptoms of common bacterial blight on a lower leaf surface of bean, caused by *Xanthomonas campestris* pv. *phaseoli*. (Courtesy APS, A. W. Saettler).



Figure 2. Symptoms of common bacterial blight on pods of bean, caused by *Xanthomonas campestris* pv. *phaseoli*. (Courtesy APS, J. R. Stavely, from the files of W. J. Zaumeyer).

appear to be burned. In severe infections, dead leaves remain attached to the plants at maturity. Bacteria ooze through stomata, providing inoculum for secondary spread.

Pod symptoms consist of lesions that are generally circular, slightly sunken, and dark red-brown (Figure 2). Lesions vary in size and shape depending on pod age. Under highly humid conditions, pod lesions are frequently covered with bacterial ooze. Symptoms on white seeds are evident as butter yellow or brown spots distributed throughout the seed coat or restricted to the hilum area (Figure 3). Severely affected seeds are frequently

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shriveled and exhibit poor germination and vigor.

Disease Cycle

Several types of primary inoculum are involved in initiation of the common bacterial blight disease. Seed contamination is the most important means of survival for *X. campestris* pv. *phaseoli*. Contaminated seeds constitutes a major source of primary inoculum worldwide and is an effective means for both local and widespread dissemination of the pathogen. *X. campestris* pv. *phaseoli* is carried in and on the seeds. Seedlings arising from contaminated seed harbor high numbers of the pathogen, which colonizes new leaves as they unfold along the stem axis.

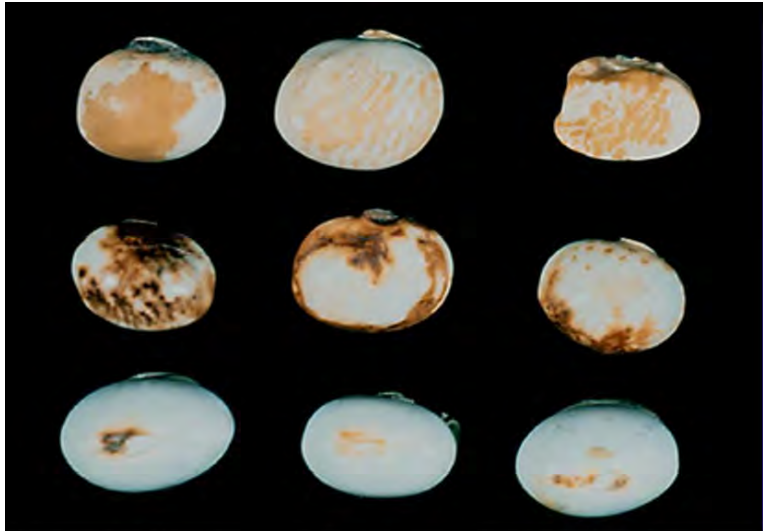


Figure 3. Symptoms of common bacterial blight on bean seeds, caused by *Xanthomonas campestris* pv. *phaseoli*. (Courtesy APS, A. W. Saettler).

Overwintering of *X. campestris* pv. *phaseoli* in infested plant debris occurs in some temperate production region. Survival is generally longer in residue at or near the soil surface than in residue turned beneath the soil surface during plowing. Infested residue is particularly important in the tropics as a source of inoculum from which *X. campestris* pv. *phaseoli* can multiply and survive as an epiphyte on volunteer beans. *X. campestris* pv. *phaseoli* lives epiphytically on leaves of nonhost crop species and weeds that serve as additional reservoir of inoculum. *X. campestris* pv. *phaseoli* is a warm-temperature pathogen that causes greatest damage to plants at 82-90°F (28-32°C). High humidity, rain, or both favor progress of the disease in the field. The time between initial infection and production of inoculum for secondary infection is 10-14 days. *X. campestris* pv. *phaseoli* is spread by windblown rain and plant debris, contact between wet leaves, irrigation water, people, animals, and insects such as whiteflies and leaf minors.

Disease Management

- Plant pathogen-free seed.
- Consider crop rotation with nonhost crops for 2 years.
- Plow soil immediate after harvest to incorporate plant debris to breakdown tissues to prevent inoculum buildup.
- Control volunteer beans and weeds.
- Several copper compounds have been labeled for use to slow down spread of the common bacterial blight of beans. For up-to-date information on using chemicals for control of bean common bacterial blight, refer to the “Midwest Vegetable Production Guide for Commercial Growers.”