Pacific Northwest
Vegetable Extension Group

Identification & Management of Emerging Vegetable Problems in the Pacific Northwest

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Halo Blight of Beans

Affected plant species: Common bean, lima bean, and soybean

Common name of the causal organism: Halo blight

Latin binomial: *Pseudomonas syringae* pv. *phaseolicola*

Symptoms & key characteristics for identification: The first symptoms are small, water-soaked lesions resembling pinpricks on the underside of leaves. The small lesions rapidly turn dry and reddish-brown, and are visible on both sides of the leaf. Lesions usually remain small. A yellow zone resembling a halo often develops around the lesions. Symptoms can spread throughout the plant, leading to yellowing and death of new foliage. Pod symptoms begin as tiny, water-soaked spots on the pod that gradually enlarge to form dark, sunken lesions. Seeds in infected pods can be discolored, shriveled, and small. It is important to note that the halo blight pathogen can be present in bean crops and on bean seed without visible symptoms.

Fig. 1. Water-soaked lesion on the underside of a bean leaf. Photo Source: Carrie H. Wohleb, WSU.

Fig. 2. Reddish-brown lesions and yellow halos on bean leaves. Photo Source: Carrie H. Wohleb, WSU.

Fig. 3. Foliar halo blight symptoms. Photo Source: Carrie H. Wohleb, WSU.

Fig. 4. Halo blight on bean pod and seeds. Photo Source: Howard F. Schwartz, Colorado State University.

Biology/epidemiology: The pathogen that causes halo blight is usually introduced into an area on contaminated seeds. Once introduced, the bacterium can spread from plant to plant and to

nearby fields in windblown water (rain and irrigation), soil, and plant debris. Spread also occurs by contact between wet leaves, or in irrigation water, and on contaminated equipment, people or animals moving through infested fields. The bacteria gain entry into plants through wounds and natural openings during periods of high humidity or when the foliage is wet. The pathogen can overwinter in or on contaminated seeds, infested plant debris, volunteer plants, or weed hosts. Halo blight is generally more severe when conditions are humid and cool to moderate (daily highs <80°F).

Management: Bean seed quarantines have been established in some counties of Idaho, Oregon, and Washington to reduce the risk of introducing certain seedborne bacterial pathogens, including the halo blight pathogen, into major bean production areas. Unfortunately, the disease does occur in these regulated areas on occasion, despite the quarantines. Several management strategies can be used for halo blight:

1) Plant only bean seed that is certified as pathogen-free. Seeds produced in arid regions under furrow or drip irrigation are less likely to be infested.
2) Clean equipment before moving the equipment from one bean field into another to prevent unintended spread of the pathogen.
3) Avoid cultivation or traffic moving through fields when the foliage is wet.
4) Do not cultivate when stands are tall enough that equipment passing through the field will damage plants.
5) Avoid overhead irrigation. If overhead irrigation is used, allow the canopy to dry completely between irrigations.
6) Use copper-based bactericides (e.g., copper hydroxide) to reduce growth of bacteria on foliage and spread of bacteria to healthy foliage and pods. The first application should be made before symptoms appear, with repeat applications at 7- to 14-day intervals. Bactericides will not eradicate bacterial pathogens once plants are infected.
7) Incorporate bean residues to reduce inoculum as bacterial pathogens survive longer on crop residues left on the soil surface than on residues incorporated into the soil.
8) Reduce overwintering pathogen populations by using at least a three-year bean crop rotation. Remove and destroy volunteer bean plants.

Selected references:

Wohleb, C.H., and L.J. du Toit. 2010. Common Bacterial Blight and Halo Blight: Two Bacterial Diseases of Phytosanitary Significance for Bean Crops in Washington State. Washington State University Fact Sheet No. FS038E. http://mtvernon.wsu.edu/path_team/FS038E-CommonBacterialBlightAndHaloBlight.pdf.

Pacific Northwest Vegetable Extension Group of Washington State University, Oregon State University, and University of Idaho. http://mtvernon.wsu.edu/path_team/vegpath_team.htm

Pacific Northwest Vegetable Extension Group of Washington State University, Oregon State University, and University of Idaho: Photo Gallery of Vegetable Problems http://mtvernon.wsu.edu/path_team/diseasegallery.htm