
Bacterial Spot

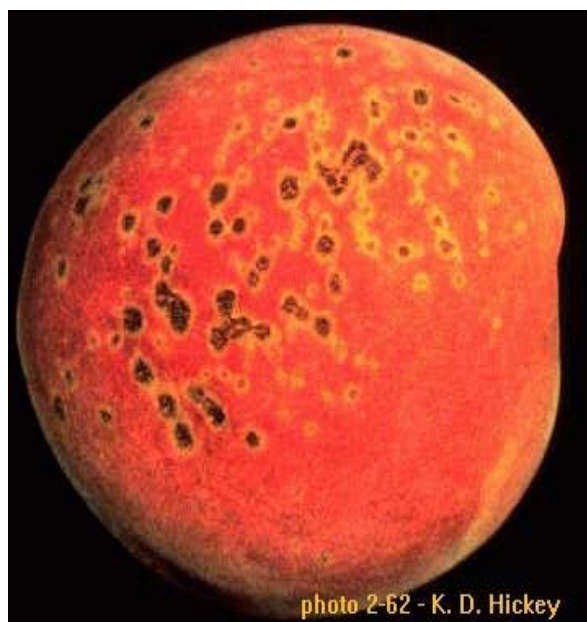
Xanthomonas pruni

I. Introduction: Bacterial spot is a serious disease of peach, nectarine, apricot, almond, and plum. It can severely devitalize trees by defoliation and it reduces yield and quality of harvested fruit. Most varieties developed in more humid areas of the country possess fair to good tolerance to the disease. Varieties developed in drier areas of the country are frequently too susceptible to grow successfully in humid areas. Bacterial spot is of most concern in regions with annual rainfall greater than 20 inches (51 cm) per year.

II. Symptoms: Bacterial spot attacks the fruit, leaves, and current season's twigs. Fruit infections appear as tiny purple to black flecks on the fruit surface of peaches, and as water-soaked spots on nectarines and other smooth skinned *Prunus* spp. Later, the skin is "broken" and the flesh beneath the spot becomes sunken. Early season infections result in very deep lesions in the flesh, and infections within 30 days of harvest result in circular, yellowish spots on the fruit surface (photo 2-62). The leaf spots are always angular as a result of being restricted by the veins of the leaf (photo 2-63). Initially, the spots appear as water-soaked angular spots which are generally only visible when viewed with a light source behind the leaf. In about three days, the lesion becomes visible with reflected light. Within one to two weeks, the center of the lesion is "walled off" by the leaf and drops out, resulting in a shothole or tattered appearance. Leaf lesions are much more common at the distal ends of the leaves and around major leaf veins. This occurs because the water film is thicker in such areas and these regions of the leaf dry more slowly. Leaves with as few as two to three lesions turn yellow and fall. Under heavy disease pressure, only the youngest leaves remain on the tree. Captan fungicide spray injury is often mistakenly diagnosed as bacterial spot, but can be distinguished by the more circular shotholes that develop on young leaves, many of which may be damaged on only one side of the midvein. Two types of cankers appear on the twigs. Summer cankers appear in midseason as irregularly shaped, dark, slightly sunken lesions on the current season's twigs. Spring cankers develop as darkened blisters in the early spring near the twig tip of the past season's growth. The injury to the tip is so extensive that the terminal bud fails to open, resulting in a number of dead tips on the tree.

III. Disease Cycle: Leaf scars on current season's woody tissue are infected in late fall as the leaves fall from the tree. The bacteria multiply within the twigs during periods with favorable temperature and the bacteria ooze out of natural openings in the spring during periods of wetness. The bacterium requires water congestion for infection to occur. Since newly emerged leaves contain no air spaces between the cells, these leaves are immune to infection. Thus, leaf and fruit infections generally do not occur until around petal fall and shuck split, respectively. Bacteria exude from the cankers for a period of about 30 days and also exude from leaf and fruit lesions throughout the season. A dry period from petal fall and extending for about three weeks greatly reduces the potential for spread.

IV. Monitoring: Select resistant cultivars to minimize losses from this disease. On susceptible cultivars, begin monitoring at shuck split and continuing weekly through late midseason by examining 50 fruit for small lesions (photo 2-62) and 25 of the oldest leaves on each sample tree. Hold the leaves up to the light and look for angular, water-soaked lesions on the leaf blade (photo 2-63). These lesions tend to be heaviest along the midvein and at the tip of the leaf, and will be visible within 24 hours of infection which occurs after a rain or heavy dew. Within three days of initial infection, the lesions will be visible with reflected light and leaves will then begin to show the typical "shothole" type symptom. Once initial lesions are detected, make weekly examinations of 100 of the most recently developed, fully expanded leaves for lesions to determine if spread is occurring from one week to the next. Note: Captan fungicide applied under poor drying conditions will cause necrotic spots that will develop "shothole" symptoms. Such damage occurs only on the youngest leaves, often appearing as fairly rounded spots on only one side of the mid-vein and at locations along the terminal indicative of spray intervals.



There are no established treatment thresholds for bacterial spot. However, since infections occur only when the leaves are wet and the amount of disease increases exponentially, base your decision to begin a protective treatment program on three factors: 1) if the disease on this site in the past affected the quality of more than five percent of the fruit; 2) if the incidence of initial lesions in the current season is considered "common" (i.e., 20 percent or more leaves show lesions); and 3) whether new lesions have developed in the last week. Protective treatments need to be continued until two to three weeks before harvest, but can be safely suspended during periods of extended dry weather.

V. Management: The most effective means of disease management is the avoiding the selection of highly susceptible cultivars. Locating new plantings of peach and nectarine (apricot and plum, also) near orchards of highly susceptible cultivars ultimately leads to a build up the disease in the more resistant cultivars. Chemical sprays may help to reduce the levels of fruit and leaf infection. To be effective, spray applications must be applied before symptoms occur. The first spray is usually a copper compound applied just before tree growth resumes in the spring. This is followed by weekly applications of an antibiotic beginning at petal fall (alternating applications of antibiotic and copper may be effective, also, although many stone fruits are sensitive to copper and injury from copper may be difficult to distinguish from damage caused by the pathogen). The 3-week period following petal fall is critical for early-season fruit infection and establishment of inoculum on new foliage. Rainfall during this period is favorable for infection. Spray programs do not provide complete control of the disease and, in some years, may not provide control that is commercially acceptable. For this reason, the best strategy is the selection of resistant cultivars in areas where the disease is endemic.

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