

Shot hole disease on stone fruit trees

There is increasing number of leaf samples collected from cherry, peach or plum arriving at my office this year. Those samples had the same problem: shot hole disease. The name of shot hole implies that the symptom of the disease looks like gun shots. People not knowing much about the disease may mistake the problem as a result of insect feeding because the symptom on leaves caused by insect chewing sometime resembles shot hole disease.

Shot hole disease is caused by the bacterium *Xanthomonas arboricola* pv. *pruni*. In the earlier stage, the bacterium causes circular to irregular, water-soaked spots about 1 to 5 mm in diameter on leaves. Later on, those spots turn to purple or brown in color. Usually, halos and cracks can be seen between affected tissue (spots) and surrounding healthy tissue. In the later stage, the affected tissue will be broken away under various natural forces especially from wind, and finally drop out, leaving a hole (Fig. 1). Each leaf may have one to numerous holes or combination of hole and spots. Leaves with many holes or spots will turn yellow or prematurely drop off. Infected twigs show dark and sunken lesions. On the fruit, circular, brown and slightly depressed spots can be seen. Between the spot and surrounding healthy tissue, cracking or pitting can be seen, and at high humidity, gum may be exuded from the cracking area.

The bacterium mainly overwinters in twig lesions. In the spring, bacteria oozing out from the lesions are spread to other trees or other parts of the

same tree by rain splashes, insect contamination, pruning tools, or other direct contacts. When the bacterium arrives to new sites of trees, it infect readily through natural openings, wounds, and leaf scars. A weakened tree is much more prone to the infection than vigorous ones.



Fig.1. Bacterial spots and holes on leaves

Although diagnosis of shot hole disease is relatively easy, in some cases, presence of holes on leaves is not necessarily related to bacterial infection. Other factors do play and cause similar symptom. For this reason, diagnosis of a problem as this disease should be always careful. According to the literature, factors causing similar symptoms include several fungi, some earwigs, viruses, or even copper spray injury and boron toxicity. To diagnose this disease accurately, one should always take leaf and/or twig samples from troubled trees and send them to a laboratory for testing of the presence of the bacterium.

Control of shot hole disease is not easily achieved through chemical sprays. However, cultural practice is very critical to reduce the severity of the

disease. The most important practice is to remove and destroy fallen leaves. By doing so, a major bacterial source will be eliminated. Always avoid overhead irrigation to reduce transmission of the disease between branches or trees. If a new tree is scheduled to be planted, avoid planting it adjacent to a diseased tree; and always choose a healthy tree during the purchase from a nursery.