Olive Knot and Oleander Knot *Pseudomonas savastanoi* pv. *savastanoi* and *Pseudomonas savastanoi* pv. *nerii*

Hosts: Main hosts are olive (*Olea europaea*) and oleander (*Nerium oleander*). Other hosts in several different families include privet (*Ligustrum japonicum*), ash (*Fraxinus excelsior*), retama (*Retama sphaerocarpa*), forsythia (*Forsythia* sp.), myrtle (*Myrtus communis*), buckthorn (*Rhamnus alaternus*), and other less common hosts listed by J. F. Bradbury.

Disease common names: Olive knot and oleander knot.

Pathogens: *Pseudomonas savastanoi* pv. *savastanoi* and *Pseudomonas savastanoi* pv. *nerii*; syn.: *Pseudomonas syringae* pv. *savastanoi*, *Pseudomonas savastanoi*, and *Pseudomonas syringae* pv. *nerii*.

Disease Cycle

Inoculum: Infected plants are the primary source of inoculum.

Transmission: During wet weather, bacteria ooze from knots and are spread by rain to sites on susceptible trees. The olive fruit fly, *Bactrocera oleae*, is a vector. Eggs, larvae, and pupae are found in olive fruit. Winged adults emerge in early spring from unpicked or dropped fruit. Disease also may spread through a common practice of olive tree propagation used in California. Chunks of wood from old trees are buried in sawdust bins for propagation, where they sprout and later are planted as young trees. Infected nursery stocks can harbor the pathogen without showing symptoms for several years, but frequently, after a hail storm or a freeze, numerous knots form rapidly throughout the tree, indicating that the stock wood was already infected. Pruning tools also may transmit the pathogen.

Infection: Infection usually occurs in the fall or spring when temperatures are low but moisture is present. Bacteria penetrate wounds and natural openings, such as leaf scars, pruning wounds, or bark cracks induced by freezing. All cultivars are susceptible and damage can be severe when weather favors disease development.

Symptoms and signs: Knots, also called galls, may develop on all parts of a tree, such as exposed roots, trunks, branches, twigs, and even leaves. They first appear as small swellings, which may enlarge to 1–1.5 cm in diameter in a few months and later up to 2.5 cm in diameter on stems. By that time, they are rough and furrowed. Older knots commonly become infected by fungi, some of which girdle and kill the twigs. A severe case of olive knot can result in shoot defoliation and death of twigs and small branches along with reduced olive production. Severe disease also causes off-flavor in olives.

Survival: Once a knot appears in an orchard, the disease spreads rapidly. Bacteria apparently reside in woody tissues and possibly live indefinitely as endophytes. Large numbers of bacteria have been detected in apparently healthy wood. In spring, bacteria in California are easily retrieved from healthy-appearing stems by use of a vacuum. This explains why an occurrence such as a hail storm, which causes many wounds, can result in a severe epidemic in an orchard where knots were not previously seen.

Disease Management

The only practical control is the use of fixed copper sprays prior to infection periods, which occur in early spring and late fall in California. Two to three well-timed applications have reduced disease incidence in California. New orchards should be planted with trees propagated from disease-free trees in knot-free geographic areas. Control of the olive fruit

fly also reduces disease incidence. Trees should not be pruned during wet weather or when rain is expected. Some varieties are more resistant to olive knot than others.

References

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Surico, G., and Marchi, G. 2003. Olive knot: History and recent developments. Inf. Fitopatol. 53(12):8-12.

Wilson, E. E. 1935. The olive knot disease: Its inception, development and control. Hilgardia 9(4):233-264.

Figure 1. Small knots on oleander stem. (Courtesy W. Sinclair)

Figure 2. Multiple infections on olive stem. (Courtesy M. Schroth)

Figure 3. Knots on olive limbs and dieback of branches. (Courtesy M. Schroth)

Figure 4. Olive branch with multiple infections. (Courtesy M. Schroth)

Figure 5. Knots on young oleander stem. (Courtesy R. Raabe)

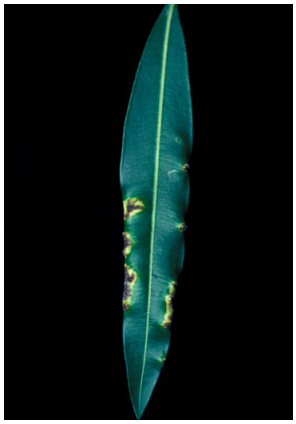

Figure 6. Early stages of knot formation on oleander leaf. (Courtesy R. Raabe)

Figure 7. Small knots and necrosis of oleander flowers. (Courtesy W. Sinclair)