Xylella fastidiosa and Olive Quick Decline: Symptoms and Identification of an Insect Vectored Pathogen[1]

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Olive trees throughout southern Italy are being killed by a plant disease called Olive Quick Decline (OQD), which begins with rapid twig and branch dieback, or "flagging" (Figure 1) and rapidly leads to the death of the tree. Although the pathogen that causes OQD is not known in Florida, producers should be on the lookout for symptoms. Symptoms often start in the upper portion of the plant and then spread toward the crown, normally within one to two months of symptom onset, producing a burned appearance. Whole groves of ancient trees, hundreds of years old in some cases, have been killed. First associated with the disease symptoms in 2013, *Xylella fastidiosa* (*X. f.*), is a bacterial plant pathogen spread primarily by several different leafhopper insect vectors (Figure 2) that feed on xylem tissue. While this disease is not currently found in Florida, there is potential for a subspecies, *X. f. pauca,* to be spread to the state and other areas of the United States through the movement of diseased plant tissue and insect vectors. It is important that olive growers, and homeowners with olives, monitor for potential disease symptoms and act swiftly to limit spread of the disease. The purpose of this article is to help them do so.

Xylella fastidiosa is not a newly discovered plant pathogen. It is widely known for its ability to cause Pierce's disease in grapevines as well as other scorch diseases across North America, including Florida. To date, the subspecies known to cause Pierce's disease in grapes is not believed to be associated with OQD. The subspecies of the bacterium *X. f. pauca* has been associated with the disease in Italy and is also endemic to parts of South America as a disease of citrus. Other *X. f.* subspecies currently known to the United States have not yet been reported to cause disease expression in citrus or OQD in states like California and Florida. It is, though, important for all US residents and visitors to be aware of the serious implications of moving unregulated plant and animal parts across state and country borders. For more information on this topic, please review the FDACS Summary of Plant Import Regulations.

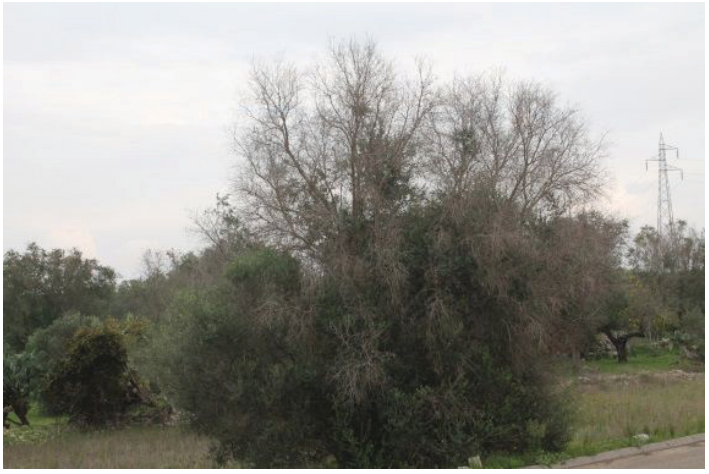

Figure 1. Infected olive tree (Italy) exhibiting flagging symptoms of OQD.
Credits: Whitney Elmore, UF/IFAS

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Figure 2. Adult glassy-winged sharpshooter, *Homalodisca vitripennis*.
Credits: Lyle J. Buss, UF/IFAS

X. f. pauca Facts

- This is a subspecies of *X. fastidiosa.* It is not known to cause the same disease symptoms in grape, citrus, and other broadleaf trees as it does in olives.
- The disease is vectored by xylem-feeding insects such as leafhoppers, sharpshooters, and spittlebugs.
- *X. f. pauca* multiplies and spreads throughout host tissue, restricting water movement in the xylem.
- Insect vectors feeding for short periods of time can acquire the bacterium and carry it to new hosts.
- *X. f. pauca* can also be transmitted by contaminated material during grafting.
- The full host range of *X. f. pauca* is not currently known.

Common *X. f. pauca* Infection Symptoms in Olive

- Leaf scorch moving from the tip toward the petiole (Figure 3).
- Twig and branch desiccation normally beginning in the upper branches first (Figures 4 and 5)
- Darkened xylem tissue upon inspection of limb cross-sections
- Desiccated fruit that resists drop
- Proliferation of suckers until roots are affected (Figure 6)

Not all of the symptoms must be present to diagnose an infected tree.

Figure 3. Infected olive tree showing branch tip dieback in the background and in the foreground, leaf scorch symptoms of OQD starting at the leaf tip and moving toward the petiole.
Credits: Rodrigo Kruger, USDA-ARS

Figure 4. Branch dieback on olive infected with OQD.
Credits: Rodrigo Kruger, USDA-ARS

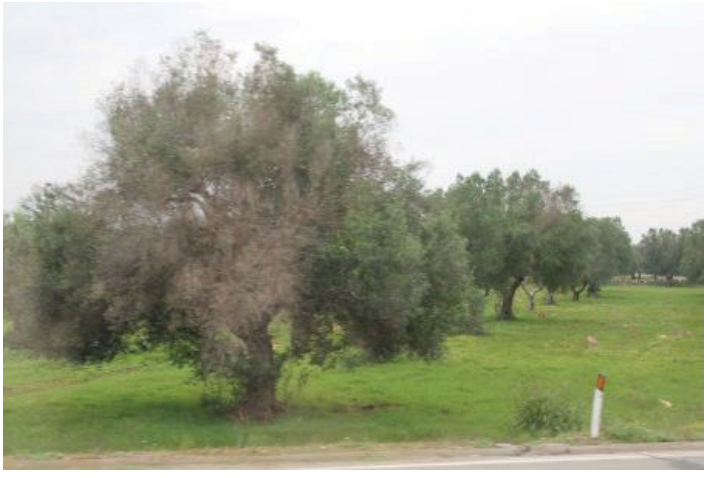

Figure 5. Infected olive tree (Italy) showing severe branch desiccation caused by OQD.
Credits: Whitney Elmore, UF/IFAS

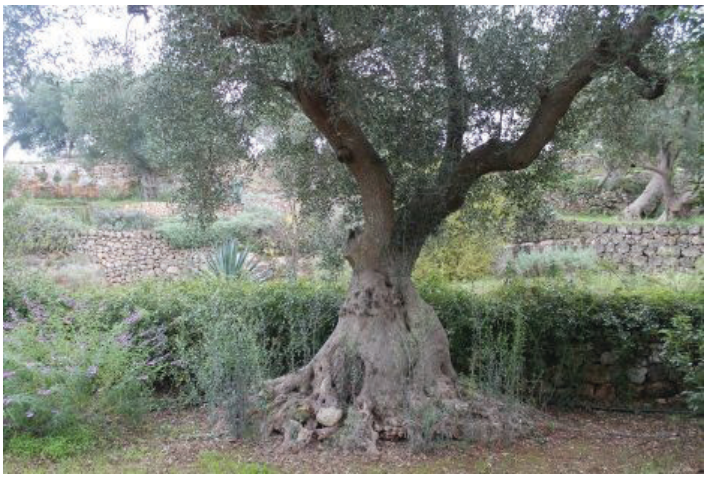

Figure 6. Infected olive tree (Italy) exhibiting root sucker proliferation in response to OQD.
Credits: Whitney Elmore, UF/IFAS

Recommendations

Currently there is no cure for OQD. Limited control efforts, like rapid removal of suspicious plants, are designed to prevent disease spread. Effective control of the insect vector may help slow disease spread, but spraying to control these insects has previously been attempted and found to be expensive and futile (insect vectors are known to fly long distances between hosts). Control of weeds with herbicides and close mowing of grasses in groves can also help limit insect vectors by limiting their access to other host plants. There are natural enemies to some insect vectors such as parasitic wasps in the genus *Gonatocerus*, as well as mantids and dragonflies. Promotion of natural enemies can help reduce insect vector populations.

For more information on sharpshooters, please see Glassy-Winged Sharpshooter, *Homalodisca vitripennis* (=*coagulata*) (Germar) (Insecta: Hemiptera: Cicadellidae: Cicadellinae) by Conklin and Mizell. To learn more about Pierce's disease and leafhoppers, please see *Xylella fastidiosa* Diseases and Their Leafhopper Vectors by Mizell, Andersen, Tipping, and Brodbeck.

If you suspect you have the insect vectors and/or damage from *Xylella fastidiosa*, please contact the authors. Visit with faculty at your local UF/IFAS Extension Office for information on how you can submit a plant sample for OQD pathogen identification at the UF/IFAS Plant Diagnostic Center.

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