

# Possible Role of *Xylella Fastidiosa* in Citrus Blight

D. L. Hopkins, F. W. Bistline, and L. W. Russo

Blight symptoms are similar to those of other diseases known to be caused by the xylem-limited, Gram-negative bacterium, *Xylella fastidiosa* Wells *et al.* In Florida, these diseases include Pierce's disease of grapevine, phony disease of peach, oak leaf scorch, and sycamore leaf scorch (3).

## Recovery of *X. fastidiosa* From Citrus

In 1977, *Oncometopia nigricans*, a common leafhopper vector of Pierce's disease of grapevine which also feeds on citrus, was used to transmit the Pierce's disease strain of *X. fastidiosa* from citrus blight trees to Carignane grapevines (4). Typical Pierce's disease symptoms developed in the grapevines and the bacterium could be cultured from the symptomatic leaves.

In later work, *X. fastidiosa* has been cultured directly from extracts of citrus with blight. However, the bacterium can be cultured only from a very low percentage (<10%) of the trees with blight. Isolates of *X. fastidiosa* have been obtained from vacuum extracts of stems and roots from trees with blight. However, pure colonies of *X. fastidiosa* are rarely obtained directly from citrus extracts. Pure cultures of *X. fastidiosa* have been obtained by inoculating grapevines with bacteria from colonies that are partially reactive to antisera to the Pierce's disease bacterium and reisolating from the grapevine. In this case, the grapevine is used as a selective host for the *X. fastidiosa* strain.

Strains of *X. fastidiosa* that have been recovered from citrus with blight were used to inoculate citrus, and have produced stunting and

dieback symptoms in rough lemon, rangpur lime, and sweet orange seedlings (2). Symptoms have also been produced in sweet orange on rough lemon rootstock, which is the combination that is most susceptible in the grove in Florida. However, only one inoculated sweet orange on rough lemon has been positive in all the diagnostic tests for blight. While this provides evidence for the involvement of *X. fastidiosa* in the blight syndrome, the conclusive evidence that is lacking is the production of the complete blight syndrome in mature trees after inoculation with *X. fastidiosa*.

## Field Studies of *X. fastidiosa* in Citrus

In two South Florida citrus groves where blight is severe, mature trees with blight symptoms were sampled monthly and tested for the presence of *X. fastidiosa* using enzyme-linked immunosorbent assay (ELISA) of root and stem extracts. In both groves, there was a seasonal pattern to the detection of bacteria in the trees. *X. fastidiosa* was consistently detected in extracts from blight trees during mid-summer (June-August) and mid-winter (December-February). During these peak periods of bacterial detection in trees, 50-75% of the blight-affected trees sampled were often positive for *X. fastidiosa* by ELISA.

In another test, populations of sharpshooter leafhopper vectors of *X. fastidiosa* were monitored in four 11-ha plots of Valencia oranges and four 6-ha plots of Pineapple oranges in a blight-affected grove (4). When leafhopper populations increased, supplemental insecticides were

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applied to half of the plots. The supplemental insecticides significantly reduced the populations of leafhoppers and resulted in a lower rate of spread of citrus blight in the plots. In

summary, *X. fastidiosa* was consistently detected in blight-affected trees and after insecticidal control of the leafhopper vector, the rate of spread of citrus blight was reduced.

#### LITERATURE CITED

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