

Destructive citrus greening disease affecting Florida

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Urgency, cooperation, and persistent management are needed among producers, processors, government officials, and scientists while solutions are developed and implemented to combat the citrus greening disease threatening Florida citrus production, says a new report from the National Research Council. Requested by the Florida Department of Citrus, the report lays out a strategic plan to control citrus greening and develop a comprehensive solution to diseases that damage citrus crops.

First detected in Florida in 2005, citrus greening is a deadly [bacterial disease](#) that affects all citrus varieties and is spread by an insect, the Asian citrus psyllid. Trees infected with the disease have yellow shoots; blotchy leaf color; reduced amount of fruit; and fruits that are abnormally small, lopsided, or "off" in flavor. After infection, the first symptoms may appear in six to 18 months, with relatively fast progression of the disease throughout an orchard. As the severity of the disease increases, citrus yield drops and could make the orchard's production uneconomical in seven to 10 years after planting. The committee that wrote the report found that citrus greening and measures taken to control it reduced Florida orange juice production by several percent by 2008, and losses will likely increase.

Although there is no cure, three-pronged programs have demonstrated some effectiveness in areas not yet severely affected by the disease, but the number of infected citrus trees in Florida continues to rise. The programs rely on production of mandated propagation material in insect-proof facilities, reduction of the Asian citrus psyllid populations, and

visual identification and prompt removal of infected trees. To be effective, this program must be continued vigorously, even if the number of infected trees increases in the first years of the program. However, if the disease advances rapidly and more than a few percent of the trees in a grove must be removed every year, production will not be sustainable in today's citrus industry, the committee concluded.

The most powerful long-term management tool likely will be the cultivation of citrus trees resistant to the bacteria that cause citrus greening and to the Asian citrus psyllid, the committee said. Genetic engineering holds the greatest hope for generating trees with these traits. If bacteria-infected trees can be found and removed sooner than through visual detection, the number of infected Asian citrus psyllids and spread of the disease should drop significantly. The committee recommended research to identify indicators that could more efficiently detect infected citrus trees, especially those that may not show symptoms. Orchard test plots consisting of infected trees that show no symptoms, as well as ones with symptoms, also should be established to evaluate new scouting and therapeutic methods.

Until these approaches can be implemented, the report lays out other high-priority actions that could sustain citrus production, including:

- creating "citrus management areas" in Florida to facilitate mitigation of citrus greening and other threats to citrus production,
- integrating efforts to improve insecticide control of the Asian citrus psyllid,
- expanding extension efforts that emphasize removal of infected trees in groves, and

- encouraging homeowners to remove backyard citrus trees, particularly trees infected with citrus greening.

The committee also found that greater use of insecticide sprays, as currently required for successful suppression of the Asian citrus psyllid population, runs the risk of the insect developing resistance to the insecticides, the number of beneficial insects decreasing, and the groundwater being contaminated. More information on Asian citrus psyllid behavior and [citrus greening disease](#) are needed to improve the insect's suppression, and research should aim to develop alternative Asian citrus psyllid management strategies.

The incursion of citrus greening disease has been more effective than any prior event in bringing industry, government, and universities together in the defense of citrus production in [Florida](#), the committee stated. However, unifying research efforts on the national and international levels, with an emphasis on strategic planning, would probably produce usable results to help mitigate citrus greening disease more rapidly. Information transfer could be enhanced by establishing an annual international research meeting and increasing Internet-accessible data banks. Coordination of research funding and project monitoring could be improved by allowing an organization, preferably an existing one, to have oversight responsibility for research and development efforts. In addition, an analysis of the economic impacts of citrus greening disease, including a cost-benefit analysis and the potential of new technological developments, should also be completed.

Provided by National Academy of Sciences

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