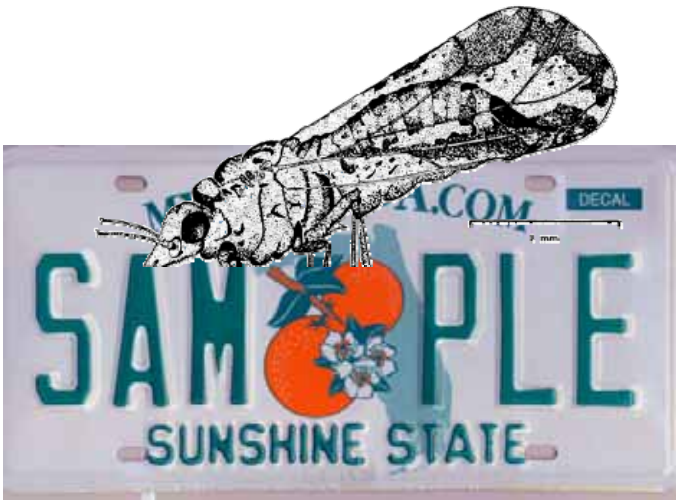

Florida's Next License Plate?

Title: Will **"**Going Green" Take Florida Orange Juice Off the Breakfast Menu?

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Abstract: Citrus greening, described as the world's most serious citrus disease, was found in Florida groves in 2005. In other areas of the world where greening is a problem, it has never been successfully eradicated. This fatal bacterial disease is transmitted by the Asian citrus psyllid *Diaphorina citri,* a tiny insect that is now widely distributed throughout Florida. To date, researchers have been unable to culture the bacterium, *Candidatus Liberibacter asiaticus.* Diseased trees produce fruit that is green, lopsided, and bitter; trees weaken and eventually die.

Until 2005, citrus canker was the disease that threatened the profits of the Florida citrus industry. Affected trees produced fruit that had unsightly bumps and coloration on the surface, but the disease had no effect on fruit quality. The Department of Agriculture responded to the citrus industry's pleas for help by ordering the eradication of all affected trees and all healthy citrus trees within a 3 mile radius of any diseased tree. What followed this order was pure chaos. Agriculture employees, armed with chainsaws, stormed into private yards and decimated all citrus trees in sight. Orange trees, grapefruit trees, lemon trees and lime trees; none were spared. Trees that served generations of families their daily doses of Vitamin C now lay in piles of sawdust in backyards all over Florida. Backyards that once served as shady oases were bared to the harsh, hot, Florida sun; and all of this was all done in the name of protecting the profits of the citrus industry.

In the long term, the industry could have lived with and managed the canker problem. Why, then, is this disease that threatens to wipe out our signature crop in as little as five years not on the radar of most Floridians?

Mission Statement: High School biology students will learn about Citrus Greening in the classroom and in the field through a series of lessons, site visits, and simulated molecular tests. A component of this endeavor will be to partner with the UF Extension Service, local citrus growers, and to have local news media chronicle their lessons. This combined effort should increase public awareness of the dire and immediate threat this disease poses to our entire citrus industry and to differentiate the agricultural and economic implications of citrus greening to those of citrus canker.

Description of Teaching Units and Expected Outcomes:

1. Discussion to activate prior knowledge needed for the teaching module. Students will recall components of plant and bacterial cells, insects as vectors, and pathogenic versus non-pathogenic bacteria that can affect living organisms.
2. Review citrus canker disease that affected Florida early in this decade. Students should understand the political, legal, economic, and agricultural aspects of the disease. Students should further understand that the disease was aesthetic in nature and that it did not affect the quality of the fruit.
3. Students will meet with a county agent from the University of Florida Extension Agency for a briefing on the newest threat to our citrus industry—citrus greening. Students should understand the symptoms of the disease, the potential of this disease to eliminate our signature crop, and the differences between the threat of citrus canker and citrus greening in terms of economics.
4. Students will take a field trip to a citrus grove to view both healthy and diseased trees. This will enable students to identify trees that have citrus greening. It should further help students understand the severity of the disease.
5. Students will learn about the serological tests that scientists perform to identify a disease. Students should understand that the diagnosis process of disease is a process that involves a series of scientific steps. Students should further understand that this process is a logical set of steps that occurs for identification of most diseases.
6. Students will simulate the serological tests that scientists use to identify unknown diseases by performing DNA extractions, ELISA assays to determine if the disease is present, PCR to amplify the DNA and then run gel electrophoresis for visualization of the results.

Expertise of the Principal Instructor: