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Novel Repellant of Asian Citrus Psyllid and HLB Transmission in Citrus Crops

The Asian citrus psyllid (ACP), an insect known to carry the bacteria which causes Huanglongbing (HLB) or citrus greening disease, is threatening citrus industries across the globe, as a tree will eventually die once infected with this disease. The consequences of ACP are many: it spreads throughout commercial groves, growers are then forced to abandon their fields, leaving nearby remaining fields vulnerable, and statewide quarantines have been enacted. This pest has caused a totaled estimated cost of \$1.3 billion in losses for Florida citrus growers.

Insecticides have limited success in warding off ACP, and there is serious concern that ACP will grow resistant to them. The foliar method is solely used for bearing trees and is somewhat helpful, but it can sometimes unfortunately ward off natural ACP antagonists like ladybeetles and parasitic wasps. Although the USDA has recently launched a \$30 million effort to research ways to stop this pestilence and resulting disease, there is currently no available cure for HLB.

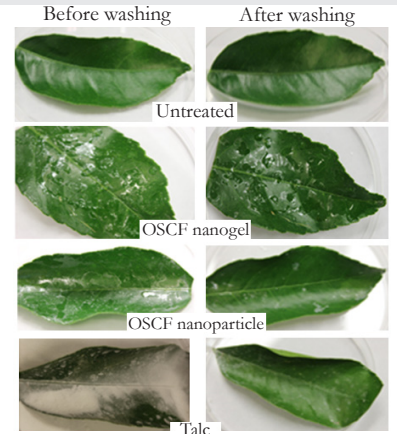
UCF researchers have created a novel method to protect citrus crops from ACP, which involves a combination of silica, PAM (polyacrylamide), and plant nutrients to be uniformly applied onto plants. This composition forms a barrier on plants and can be used to prevent HLB transmission and promises to deliver a short-to-intermediate solution to citrus greening.

Technical Details

This novel repellant is composed of an environmentally friendly, non-phytotoxic, organo-silica-based composite film (OSCF) material, which is both hard, because of the silica sol-gel/colloidal silica particles and ionic cross-linker (e.g., Ca^{2+} and Mg^{2+} ions), and sticky, due to PAM. These two attributes enable it to strongly adhere to plants with superior rainfastness, and provide an effective barrier to ACP, altering the feeding behavior of the insect, and thus substantially reducing or eliminating HLB transmission to the plant. The OSCF material also emits a pungent odor which aids in repelling ACP from citrus plants. This repellant can be used as a nanogel or a nanoparticle composition.

UCF Inventors

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**See below for a detailed image description*

Benefits

- Low cost
- Environmentally friendly
- Superior rainfastness

Applications

- ACP repellant for citrus crops

Tech Field

Advanced Materials

Keywords

Asian citrus psyllid, ACP, HLB, Huanglongbing, citrus greening

Patent Pending

**Image description: Rainfastness study of OSCF materials. (a) Untreated, (b) OSCF nanogel and (c) OSCF nanoparticle film materials, sprayed on citrus variety, Lime. Under green-house conditions, approximately 5mL of as synthesized formula was sprayed on plants. Left panel and right panel show digital photograph of leaf surface before and after rainfall simulation (above six inches rain fall). OSCF nanogel exhibited outstanding rainfastness in comparison to OSCF nanoparticle. Talc and PAM completely washed off from the leaf surface.*

If you or your company are interested in this opportunity, Contact:

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