



Growing citrus under enclosures



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What is the technique?

Citrus production under protected environments reduces huanglongbing (HLB) disease incidence and damage by excluding the Asian citrus psyllid (ACP) vector from access to citrus trees by surrounding them with a screen barrier. In addition to protecting citrus from the disease, it greatly reduces insecticidal sprays applied to control psyllids. This reduces costs and selection for insecticide resistance in the psyllid.



Examples of citrus under protective screens (CUPS)

How does it improve HLB management?

Completely enclosed screenhouses physically exclude the ACP and thus prevent inoculation of the plants with the CLas bacteria that causes HLB. A screened enclosure in Florida fully protected young grapefruit (*Citrus × paradisi*) trees from eggs, nymphs and adult ACP and no trees tested positive for CLas inside the enclosure after two years of monitoring. In contrast 100% of surveyed trees in the nearby open-air plots tested positive for CLas during the same period. Thus, the use of screenhouses offered a substantial level of protection against the establishment of HLB, compared to management programs founded solely upon protecting the citrus from ACP using insecticidal sprays.

Who is working on the Project?

The citrus under protective screen system was developed at the University of Florida/Institute of Food and Agricultural Sciences (UF/IFAS) Indian River Research and Education Center in Fort Pierce, FL and has been tested at the UF/IFAS

Citrus Research and Education Center in Lake Alfred, FL. The economics of citrus under protective screens (CUPS) is being determined. To date, there are 50 acres of commercial CUPS with three growers in Florida, and at least 150 more acres are planned (Eduardo Pines and Steven Callaham, personal communication).

Drs. Rhuanito Ferrarezi, Arnold Schumann, Ariel Singerman, Jawwad Qureshi, Philippe Rolshausen (UC Davis), Andrew Krajewski (International Citrus Technologies, Australia), Elizabeth Grafton-Cardwell, Stephen Futch, Chris Oswalt and Garima Kakkar are currently part of this research.

Dr. Ferrarezi is with the University of Florida Horticultural Sciences Department. He is a professor of citrus horticulture and is located at the Indian River Research and Education Center in Fort Pierce, FL. All other researchers with the exceptions of Grafton-Cardwell (UC Riverside), Krajewski (International Citrus Technologies, Australia), and Rolshausen (UC Davis) are at the University of Florida.

What are the challenges and opportunities?

Researchers are still answering many questions about the technology, such as the most suitable citrus varieties, the installation and maintenance costs, the economics and level of fruit production, the level of labor needed, pest and disease control, resistance to extreme weather conditions such as frost, tropical storms and hurricanes, irrigation and fertilization, canopy management and other technical aspects. The Florida CUPS group recently received a USDA-NIFA-CDRE grant to address a number of these topics.

Ferrarezi RS, Wright AL, Boman BJ, Schumann AW, Gmitter FG, Grosser JW. 2017. Protected fresh grapefruit cultivation systems: Antipsyllid screen effects on environmental variables inside enclosures. *HortTechnology* 27(5): 675-681. <http://dx.doi.org/10.21273/HORTTECH03790-17>

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