

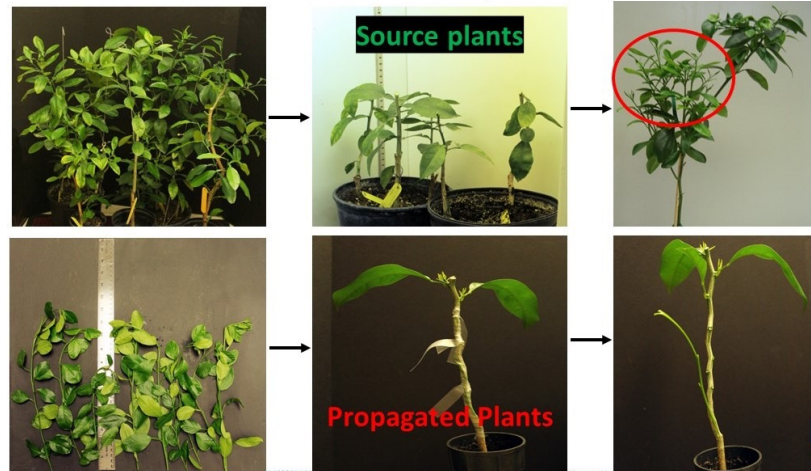
# Accelerating the Release of New Citrus Varieties through Alternate Temperature Treatment

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## Procedure for Alternate temperature treatment



### Take Home Message:

- Clean-up field material in a short time and more efficiently.
- Accelerate releasing new varieties from the citrus improvement program.
- Provide the growers with high quality and pathogen-free scions and rootstocks as early as possible.

**Summary:** Utilizing alternating temperature treatment, this project aims to rapidly establish pathogen-free budlines from potentially huanglongbing (HLB) tolerant/resistant scions and rootstocks tested in Florida fields. Under strong HLB pressure in the field, we identified new sweet orange clones with earlier maturity, higher fruit quality, and potential HLB tolerance. Several

mandarin hybrids, mostly seedless triploids, are showing fresh market and/or juice blending potential combined with HLB tolerance. We produce hundreds of new rootstock hybrids on an annual basis and have been screening them for the ability to mitigate HLB in susceptible scions. Few show no *Candidatus Liberibacter asiaticus* (CLAs), causal agent of HLB, replication in the roots and are showing promise to control the disease. Florida law requires that mother plants for replicated field trials be disease-free. Thus, we need to quickly generate legal, pathogen-free budwood for advanced replicated Stage-II trials at multiple locations. We established a protocol enabling growth of citrus tissue free of HLB and citrus tristeza virus (CTV) from

infected plants under controlled conditions. It is based on switching between elevated temperatures which are on the limit of plant survival that severely restricts pathogen replication/multiplication, and normal temperatures ideal for plant growth and pathogen replication/multiplication. For citrus, the alternating temperature treatment is based on cycling plants in the growth chamber between four hours at 42°C, and four hours at 25°C for 3 to 4 months, during which new flushes emerge and mature. The goal is the delivery of pathogen-free high-quality scions and rootstocks tolerant of HLB that reduce tree decline and crop losses and provides sustainable and profitable citrus production.

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