Effect of trunk-injected oxytetracycline on preharvest fruit drop and health of HLB-affected sweet orange trees

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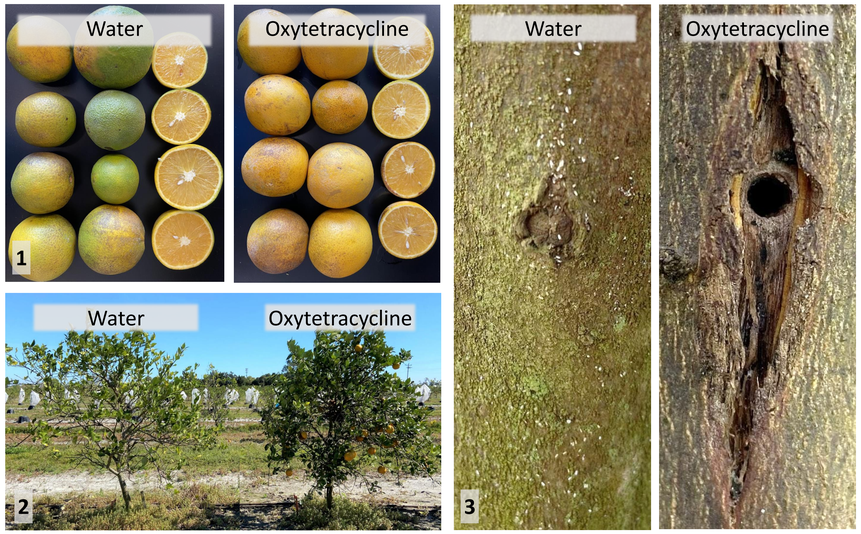

Images 1-3: 1. Fruit quality at harvest; 2. Tree health one month before harvest; 3. Wounding impact of oxytetracycline injection

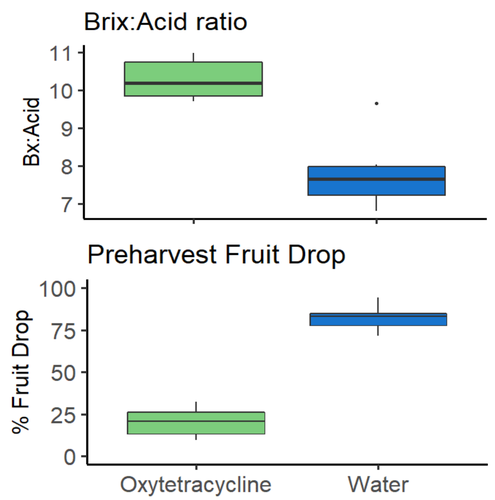

Figure 1: Brix:titratable acidity in OTC injected fruits at harvest (top); percent preharvest fruit drop (bottom)

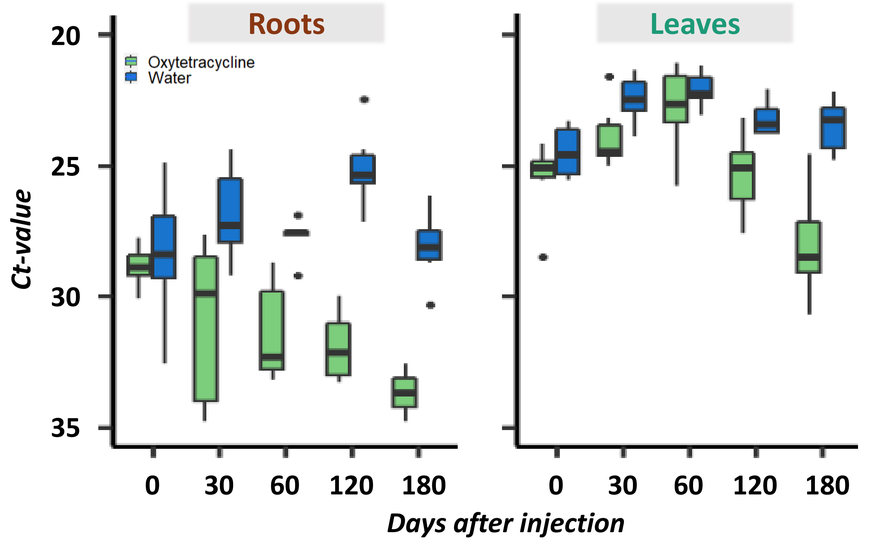

Figure 2: CLas Ct values from 0 to 180 days after injection in roots (left) & leaves (right)

Significance

- ***Huanglongbing*** (HLB): a phloem limited bacterial pathogen endemic in Florida and detected in both Texas and California citrus producing regions
  - Causes massive declines in yield due to preharvest fruit drop
  - Spray treatments of therapeutics are ineffective due to the location of the pathogen in the phloem
- ***Trunk injection***: delivers therapeutic compounds directly into tree xylem, which reduces runoff and drift while increasing compound efficacy

Methods

- ***Plant material***: 5-year-old field-grown, HLB-affected sweet orange, cv Midsweet and Valencia (*Citrus sinensis)*
- ***Treatment***: 2g Arbor-OTC® (40% oxytetracycline) applied with ChemJet® tree injectors six months before harvest
- ***Analyses***: Bacterial detection (qPCR), OTC residual analysis (spectrophotometrically); fruit drop; yield; fruit quality; tree injury

Results

- ***Midsweet***: OTC Injection in June **reduced leaf bacterial levels** (increased Ct-values) from 22.5 to 33.5 by February
  - Average yield of OTC treated trees was 5.2 kg per tree, compared to 0.63 kg in control trees
- ***Valencia***: OTC injection in October **reduced root bacteria before reductions in leaf bacteria** were significant
  - OTC treated trees had an average yield of 9.4 kg per tree, compared to 2.5 kg in the control
  - Mean **fruit drop in OTC treated trees was 20%**, compared to 82% in water injected trees
- Effects of tree injury from injection need to be studied over multiple seasons before making recommendations to growers