

Field Trials with the Antimicrobial Peptide SAMP

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Take Home Message:

- Novel products need good field testing to ensure promising results in greenhouse and laboratories hold up to the harsh field environment.
- Novel products need work on formulation and several years of development to make sure they reach their potential.
- It is important to understand the risks involved in novel product products and that disappointment is common.

Effort Statement: Field trials are continuing but the trees were damaged by the hurricanes, freezing weather, and hail in spring 2023. In the current treatment format, the SAMP peptide does not appear to have the anticipated protective or curative capacity under field conditions and difficult conditions to which the trees were subjected.

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Summary: Public interest has been high concerning the new type of antimicrobial peptide (named stable antimicrobial peptide or SAMP) announced by the University of California, Riverside in 2021. This peptide from the citrus relative, *Microcitrus australiasica*, has been reported to be able to prevent huanglongbing (HLB) or improve infected tree health in very controlled circumstances. Antimicrobial peptides in general are small proteins with features that allow them to kill microorganisms like bacteria, fungi, and some viruses. The ways that these small proteins kill microorganisms can vary, but SAMP appears to poke holes in the outer membrane of the bacterium. The effect would be similar to sticking holes in a rigid balloon, allowing the contents to escape. While SAMP is reported to be effective in very controlled conditions, it is important to verify if

the peptide works in the field. Field conditions are much harsher with challenges such as UV light, rainfall, or microorganisms that could break the peptide into smaller pieces which may affect its effectiveness. We have two early-stage field trials with SAMP. The first trial is to look at whether SAMP can protect newly planted trees from HLB. The trees were planted in October 2020. The second trial is focused on whether young HLB-affected trees (4-years-old) can improve their yield, fruit size, and fruit quality after treatment. The peptide is being applied as a foliar application using standard spray equipment along with another application method. Results are still preliminary and are not ready to be reported at this time. New application methods are being explored that will give a continuous dose of the SAMP to the trees to see if that is more protective.