Current Research Objectives

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Research topic: Plant Improvement

Primary Research Objective(s): Developing engineered HLB tolerant citrus rootstocks and scions

Research Goal: Utilize existing germplasm that forms the backbone of the citrus industry to develop engineered citrus with an enhanced internal defense system to keep the plant constantly primed against infection.

Outcomes to date: We have learned that citrus trees that are engineered with the Arabidopsis (a mustard plant relative)-derived NPR1 gene and the tobacco derived SA-binding protein 2 (SABP2) have enhanced tolerance to HLB. This is mainly due to the enhanced activity of several endogenous disease-fighting pathogenesis related (PR) proteins produced directly due to expression of either NPR1 or SABP2. Some sweet orange trees have remained HLB free under field conditions for several years. These genes have been incorporated into Kuharske and Swingle rootstocks and are being incorporated into other elite sweet orange and grapefruit cultivars. A select set of the engineered rootstocks have been clonally propagated and are being grafted with non-engineered sweet orange scions for field-testing. This will help determine if the improved endogenous PR protein mediated tolerance can be transmitted to the scion.

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