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Field validation of a greenhouse demonstration of phytohormone-mediated restoration of naturally infected HLB citrus in Florida, Texas and Jamaica

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A model system based on restoration of the physiological phytohormone balance in the phloem-limited bacterium *Candidatus Liberibacter asiaticus* (Las) infected citrus (orange, mercot, tangelo and grapefruit) was evaluated in the field at Ft Meade, FL, Weslaco, TX and Kingston, Jamaica. We hypothesize that development of Citrus Greening Disease or Huanglongbing (HLB), is the result of the release of latent infection precipitated by phloem blockage, root disease and the demise of the mevalonate (MEV) pathway for phytohormone production and transport. Earlier greenhouse investigations with citrus seedlings and an alternative host, Periwinkle (*Catharanthus roseus*), indicate that exogenous application of some of the products of this pathway restore the internal phytohormone balance, reverse root decline, induce new axillary buds and restore vitality and production to the tree. This treatment program was scaled up and evaluated in the field with three commercial preparations applied in the fall or in the spring. A single foliar application in the fall provided superior restoration of growth and development. Treated trees were symptomless after 3 months, flowered, set and held fruit and produced over 550 mature fruit/tree. Additional investigations of phytohormone therapy are in progress to evaluate the impact on Las titer in both old (pretreatment) and new growth. Foliar application of selected phytohormones is an effective remediation treatment for Las infected citrus.

Keywords: Citrus greening, HLB, MEV, periwinkle, remediation