Use of Surfactant to Enhance Use-Efficiency of Nutrients by Foliar Application

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Huanglongbing (HLB) is a destructive citrus disease occurring in over 40 countries. Ever since it was recognized near Miami in 2005, this disease has spread across Florida where 70% of the national citrus is produced. This experiment was conducted to improve the understanding of the application potential of additives, their interactions with nutrients and subsequent effects on nutrient uptake by citrus leaves which will also help improve the efficacy and reproducibility in performance of nutritional foliar sprays to mitigate HLB disease. Some of the symptoms of HLB are the same as those of nutrient deficiencies, specifically for micronutrients like zinc; therefore, researchers are trying to test nutrition as an alternative to tree removal as part of an HLB management program. Additives, such as surfactants, are one possible way of increasing nutrient foliar spray effectiveness and lessening chemical application rate, thus, reducing its impact on the environment. It was hypothesized that an organosilicon surfactant, Kinetic, paired with ethylene oxide would decrease surface tension, promote penetration, and decrease the phytotoxicity of Kinetic. The combined surfactant and ethylene oxide spray proved to have the greatest decrease in surface tension, highest nutrient concentrations overall, and decreased phytotoxicity by having a higher rate of photosynthetic activity than the surfactant solution. Hence, from these findings it can be concluded that the hypothesis was supported in all aspects. This information is imperative when considering the global implications of citrus greening disease and the prospects of foliar application in sustainable development.

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