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In-Field Thermal Treatment of Huanglongbing (HLB) infected Trees

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To decrease *Candidatus Liberibacter asiaticus* titer and increase the productive life of infected trees, thermal treatment of orange trees was proposed. A moving greenhouse was developed to cover single trees during the summer of 2012. Four trees (~ 2.5×2.5×2.5 m) were treated, one tree per day, during the months of September (trees T1 through T3) and October (tree T4). From each tree, three symptomatic branches were sampled to determine microbial kill before (0 h) and at 2, 3, 4, and 5 h during the treatment. Temperature distribution throughout the canopy and on the sampled branches was also recorded. Maximal temperatures in the ranges 50 to 53 °C were reached at the top (2.4 m) of the canopy whereas at the bottom of the canopy (i.e., 0.6 m) maximal temperatures ranged from 36 to 43 °C. Due to varied micro-meteorological conditions during the treatment, temperatures of the T1 through T4 sampled branches reached above 40°C for 217, 166, 35, 228 min, respectively. For T1, T2 and T4 trees, average temperatures of the sampled branches reached above 45 °C for 87, 35, and 49 min or more. Attempts to quantitatively determine microbial kill by determining percent live bacteria at selected time intervals during thermal treatment was unreliable due to the very uneven distribution of initial proportion of live-to-dead bacteria and analysis variability. However, overall, after thermal treatments, live microbial populations decreased. These findings indicate that adequate thermal treatment of trees required forced convection air flow and supplemental heating.