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Limited success of heat treatments for curing HLB affected trees

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A series of assays was conducted in an attempt to eliminate *Ca. L. asiaticus* (Las) from HLB affected plants using hot air (HA) or steam (ST). HA assays were conducted with 2-y-old greenhouse (GH) potted Valencia/Rangpur lime plants and 4-y-old Hamlin/Sunki field trees. GH plants were exposed to 38 to 44°C for 24 to 192 h in a growth chamber (GC). Field trees were exposed to sunlight under plastic cover sheets ($\geq 40^\circ\text{C}$) for 24 to 96 h after the branches were pruned 1.5 m above ground. ST assays involved root-uncovered GH plants and 5-y-old pruned Hamlin/Swingle and Pera/Cravo field trees. GH plants were exposed to 45 to 60°C for 5 to 30 min and the trees to 55°C for 5 to 20 min and 60°C for 5 or 10 min. Plant and Las responses to heat were temperature/time dependent. All plants exposed to HA for ≥ 96 h at 44°C in GC and ca. 1/3 of the trees treated for ≥ 24 h at $\geq 40^\circ\text{C}$ in the field died. Around 1/3 of the plants exposed to ST for 15 min at 50°C or 5 min at 55°C, and all plants at 60°C also died. In the field ST also damaged or killed the trees at 55°C for ≥ 30 min or 60°C for ≥ 20 min. Most of the plants or trees showed typical HLB symptoms and were PCR+ 3 to 5 months after treatment. Under the trunk bark of field trees the temperature took over 10 min to reach maximum of 50°C, which was apparently not enough to kill Las. Las survival in the trunk and roots may explain the lack of success of the heat treatments against HLB.