Putative Deletion Mutant STR-4-1 of X639 Rootstock Shows Promise

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Take Home Message:

- Discovery of a horticulturally viable rootstock that suppresses the scion auto-immune response to HLB would allow for all scions to be grown successfully in the field.
- STR-4-1 is essentially derived from X639 rootstock, a hybrid of Cleopatra x trifoliate orange, which is already among the most HLB-tolerant commercially available rootstocks.
- There is a good chance that STR-4-1 might be amenable to seed propagation in the future.

Summary: A new HLB-tolerant rootstock candidate, a putative deletion mutant STR-4-1 of X639, was discovered from a field trial of HLB-positive 'Valencia' trees on five rootstocks, remaining after a greenhouse nutrition study (all trees were planted with high titers of *C*Las in the 'Valencia' scion). After 18 months in a commercial grove, a few trees had died and most were struggling, including the other trees on X639 rootstock; however, one tree was growing vigorously and had already set approximately 50 fruits. We cut the scion to sprout the rootstock, and the recovered rootstock has now been propagated by rooted cuttings and tissue culture micropropagation (Agromillora, Florida). The recovered tree was *C*Las free. SSR marker testing revealed that all markers matched X639 as expected. However, ploidy analysis via flow cytometry showed a peak slightly before the standard X639 peak, suggesting a deletion. Preliminary testing of this rootstock with HLB-positive scions, including the highly susceptible 'Honey Murcott' suggests that the rootstock induces HLB tolerance without suppressing the *C*Las titer in the scion. This could mean that the auto-immune response responsible for the HLB symptoms in the scion is somehow being suppressed by the variant rootstock. This promising new rootstock is being mass-propagated for multiple Stage 2 trials to quickly determine its full potential. Deletions have played an important role historically in crop evolution, including the domestication of both African and Asian rice.

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