

Rootstocks, Scions and HLB Resistance

By Rick Dantzler, CRDF chief operating officer



Perhaps because we have never had one validated in the field, an unanswered question is whether a rootstock which is resistant to HLB imparts the same level of resistance to a scion which is not resistant. Clearly there are HLB-tolerant rootstocks that bestow better performance on fruit yield and quality. But what about one that is so resistant to CLAs that the pathogen cannot multiply in the rootstock even when budded with a susceptible scion? What level of benefit is conferred onto an infected scion? This is an important question, especially in the era of transgenic rootstocks. This and other questions like it will be answered in a project by Manjul Dutt of the University of Florida Institute of Food and Agricultural Sciences that was recently funded by the Citrus Research and Development Foundation.

Answers to these questions might not be as obvious as they seem. Common sense would tell us that a healthy rootstock will have more root mass and more corresponding root tips. So the uptake of nutrients should be greater, leading to better performance in the scion. But will it? Infection in the scion will remain, and reinfection will continue, meaning that clogging of the phloem and all the other manifestations of the disease will continue. Without downward flow of sap to complete the process of photosynthate delivery to the roots, we don't know with certainty if the performance of the scion will be sustained well enough to make the disease functionally irrelevant, which I define as a troublesome but manageable malady.

Now let's flip the question. Will a resistant scion (most likely a transgenic one) produce enough quality fruit if the rootstock is unhealthy?

To answer these questions, Dutt will graft promising transgenic and conventionally bred scions onto promising transgenic and conventionally bred rootstocks. Large-scale testing of multiple transgenic plants compared to standard rootstocks and scions has not been conducted, especially at multiple sites as the project anticipates. Therefore, this research is relevant, timely and needed.

Genetic stability, phenotypic traits and potential agronomic advantages will be documented, as will compatibility. Compatibility is particularly interesting because we know that some rootstock and scion combinations simply don't do well together. It will also be interesting to see how the combinations compare to orange-like hybrids which show tolerance without transgenic breeding.

Because of HLB, production levels per acre in Florida are extremely low overall. Consequently, greater tolerance would be welcome. But will greater tolerance get us to a level necessary for profitability year in and year out? Perhaps, but resistance — where the tree is essentially unaffected by the disease — should be our goal, and Dutt's project will help us answer questions about how to get there.



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