

Where do growers stand with trunk-injection therapy?

By Frank Giles

Florida growers are well into their second application of oxy-tetracycline (OTC) trunk injection as the 2023–24 season winds down. The results of the first application made last year are becoming somewhat clearer, but there's still more to observe and learn about trunk injection. Ute Albrecht, associate professor of plant physiology with the University of Florida Institute of Food and Agricultural Sciences (UF/IFAS), has been leading research efforts on the use of trunk-injection therapy. She discusses what she has been seeing in her research and in growers' groves.



Ute Albrecht

Q: What have you heard from growers about results from the first application of OTC?

ALBRECHT: Early results seem to be mixed, although many growers are reporting positive responses. There is a consensus that younger trees are responding better to the treatments than older trees and that Hamlins are not as responsive as Valencias. Older trees will likely need multiple years of injection. Injections might be more effective if split into two (on opposite sides of the trunk) to improve distribution of the OTC. Regarding the Hamlins, I don't know in which month growers performed their injections. We injected Hamlin trees in June last year, and although differences were not dramatic, we measured a positive yield and juice quality response.

Some more fine-tuning will be necessary to determine the best month of injection for the early varieties. At the time of this article (mid-March), most of the Valencias have not been harvested yet, so the full extent of the injection effects remains to be determined. We just completed harvesting two Valencia trials with several



Ute Albrecht's research team conducts trunk-injection trials at the Southwest Florida Research and Education Center and at commercial production sites.

thousand trees in each trial. The trees were injected in April and May (2023), respectively. We measured a 35% increase in pounds solids per acre in one trial and a 70% increase in the other trial. We also noted different responses for different rootstocks. The trial in which we measured the 35%

increase was overall more productive than the other trial. In addition to yield and soluble solids, the Brix/acid ratio and the juice color were improved in both trials. These results are certainly encouraging and confirm what we have been measuring in our earlier studies.

Q: How many OTC trials have you conducted and what have they been comparing?

ALBRECHT: We are always doing something new, so it's difficult to say exactly how many trials we have conducted or are in progress. At our UF/IFAS Southwest Florida Research and Education Center farm, we have conducted several small trials, mostly with young (5- to 6-year-old) Valencia trees. We have been injecting 0.75 grams of OTC per tree and, without exception, trees responded with reduced bacterial titer levels, visibly better health, less fruit drop, more harvestable fruit and better juice quality.

The same OTC rate also resulted in tremendous improvement in a mature Duncan grapefruit trial at our center. We have also begun injecting severely HLB-affected 2- to 3-year-old trees to see if they can be rehabilitated.

In commercial production sites, we have 12 injection trials in progress. Some of these trials are fairly large and encompass several thousand trees. We are comparing things such as different OTC rates, different months of injection, different OTC formulations and different injection types. This includes a comparison of the efficacy of delivering the same OTC dose in two or more injections on different sides of the trunk with that of delivering it in one single injection on one side of the trunk. We are also comparing rootstock versus scion injections and whether different rootstocks respond differently. An ongoing smaller trial at our center is investigating the integration of individual protective covers and OTC injections. So far, the results are encouraging.

Q: What are you evaluating in your latest Hamlin research?

ALBRECHT: The Hamlin trial we have in progress is near Fort Meade. The trees were planted in 2005, so they are older than what we have been testing so far. In this trial, we are testing four different OTC concentrations (from 0.55 grams/tree to 1.65 grams/tree) to determine the most effective dose in terms of cost and tree response.

We are also comparing alternate-year injections (injections in years one and three, but not in year two) with the current label recommendations

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(injections in years one and two, but not in year three). The same treatments are being tested in a Valencia trial nearby, also planted in 2005. That trial also includes a comparison of June and September injections.

Q: What are the results of the Hamlin trial?

ALBRECHT: We injected the trees in June and harvested in December with the required 180-day preharvest interval. This is the first time we injected trees of that age (19 years). Injections were performed into the scion because the rootstock trunk was too large and too furrowed for us to feel comfortable injecting into. Considering the age of the trees, the results were not too disappointing. Across all injection treatments, we measured a 26% increase in fruit yield, a 10% increase in fruit size and a 7% increase in Brix/pound solids. Among the tested rates, the best results were found with the highest OTC rate (1.65 grams/tree). That rate was applied in split injections, meaning that we injected half of the dose on one side of the trunk and the other half on the opposite side. We are hoping to see more improvements in the upcoming year.

Q: What have you been hearing from growers about how the second OTC application is going?

ALBRECHT: Year two injections seem to be in progress for the early varieties. I'm a bit uneasy about these early injections as we have never injected earlier than April in our studies. I understand that there are logistical and economic reasons for doing the injections earlier, but we don't have any data on how this affects uptake, distribution and efficacy. During the winter, trees are not as metabolically active, which may hinder uptake and effective distribution. It may also slow wound closure. Lastly, reinoculation with the HLB bacteria is likely going to occur during the spring flush, possibly making earlier injections less effective than later injections. Until we know more, I would therefore rather inject after the bloom and when the new spring flush has fully expanded.

Q: Based on your research, how do you think commercial groves will respond to the second OTC application?

ALBRECHT: We have a few commercial field trials awaiting harvest after two consecutive years of injections. Although we don't have the harvest data yet, the trees look clearly healthier, with denser canopies, darker green leaves and more fruit. The fruit are also larger and have a much better color. The effects, though they were already visible after one injection, are more obvious now. So, I'm hopeful that the benefits of two consecutive years of injections will be compounded.

Q: Is there anything else that you would like to add?

ALBRECHT: I know that costs and other logistics determine when and how injections are being performed. However, to be effective, we need to be doing it right. We have measured significant yield increases and consistent improvements in juice quality in all our trials. I advise everyone to leave some trees non-injected for comparison. A one-time injection is unlikely to restore tree health and productivity to pre-HLB



Photo by Gabriel Pugna

Research is comparing different OTC rates and formulations, injection types and the month of injection.

levels, and positive effects may not always be evident without the comparison against a non-injected control.

I also advise growers to pay attention to the month of injection. We know that injections performed between April and June consistently improve Brix/pound solids, but we are finding that August injections improve the Brix even more, at least in our

studies with 5- to 6-year-old Valencias and OLL-8. It is also worth noting that the OTC in these trials was applied with two, smaller-diameter injectors (Chemjets), and that we did not observe any leaf phytotoxicity. In fact, we have never observed any leaf phytotoxicity with split injections. More data will be available once we complete all our harvests. 🍊



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