



DETECTIVE DENDRO THE DIAGNOSTIC SLEUTH

By James Komen and Don Hodel

The Case of the Deficient Palms

I stepped off the train in beautiful Oceanside, California, and was greeted with a pleasant, cool ocean breeze mixed with the enticing smells of local restaurants serving up lunchtime fare. I was in the San Diego area on assignment, but certainly without complaint. This beautiful weather was a welcome change from back home.

I mused to myself that it was also nice to have a break from Codit, who was stuck back at the office hammering out tree inventory reports and inspecting equipment.

Only a short walk from the train station was Palm Avenue, a street passing near the Civic Center Park in downtown. An elegant allée of young date palms (*Phoenix dactylifera*) lined the street and led me to Civic Center Courtyard, an urban park made up of geometrically spaced young date palms.

At the center of the courtyard, I met my client, Desiree. She was a working single mother with a four-year-old daughter who would melt your heart. Desiree was also in charge of managing the street and park trees in downtown Oceanside.

“Detective!” Desiree greeted me warmly. “It’s good to see you again! Let me introduce my daughter, Eleanor.”

Being cordial, I extended my hand to her daughter. “Nice to meet you, Eleanor.”

Shyness got the best of Eleanor, and she opted for a meek wave before diving behind her mom’s legs to hide.

Desiree chuckled, and with one hand clutched tightly by her daughter, she began showing me around the courtyard.

“These palm trees have been giving me a bit of heartburn,” she said. “We installed two varieties of date palms, along Palm Avenue and in Civic Center Courtyard, as part of a big downtown improvement project about three years ago. We planted ‘Medjool’ along the eastern sidewalk, and we planted ‘Macho’ along the western sidewalk and in the courtyard.”

As we walked up to the sidewalk along Palm Avenue, Desiree continued, “Because this was such a high-profile infrastructure project, I made absolutely sure that I was doing everything possible to make this planting a success. I got soil tests, I supervised their installation, I inspected the palms prior to purchase, and I have made sure every palm has been given the same irrigation and fertilization ever since they were planted.”

“Impressive!”



An example of *Phoenix dactylifera* ‘Macho’, similar to the palms Detective Dendro observed in the landscape.

She then gestured across the street. “But those ‘Medjool’ palms have been showing advanced magnesium deficiency symptoms ever since, well, about a year ago.”

Sure enough, the lower fronds of the palms on the eastern side of the street had marginal chlorosis, characteristic of magnesium deficiency.

We patiently waited for the traffic to abate before crossing the road, angling for a closer inspection. It didn’t take long for me to confirm her findings.

Eleanor patted the trunk of one such palm respectfully.

I patted the trunk as well, letting my hand rest on it as I gazed upward at the yellowing fronds. “Yes, magnesium is a mobile element in palms, so those symptoms appeared in the older fronds first. It’s also commonly deficient in *Phoenix* palms, so it’s not surprising you’re seeing these symptoms.”

“I agree that it’s a common condition,” Desiree responded, “but I’ve done my best to keep them perfectly green! I’ve adhered very strictly to the published fertilizer rates for these palms, and I’ve maintained the soil pH at a perfect level just below 7. This is such a conspicuous planting that I can’t afford any raised eyebrows from the public doubting their management.”

I took a few moments to look up and down Palm Avenue. All of the palms had the same solar exposure and same-sized planters. The ‘Macho’ palms appeared green and healthy, with some scattered spent inflorescences among the older fronds. The ‘Medjool’ palms looked a little sickly, with their immature fruits hanging on peduncles among the yellow-margined and green fronds. Aside from the variety of palm, everything about the plantings looked identical on both sides of the street. I was puzzled. What was going on here?

“Excuse me for just a moment, detective,” Desiree said with a musical laugh. She pointed back to the courtyard, on the other side of the street. “My daughter and I haven’t eaten all morning.”

My gaze shifted to the little one at our knees. Eleanor, apparently, wasn’t so shy about expressing her hunger for a snack from the vending machines over yonder.

After crossing the street again, Desiree strolled to one of the vending machines at the edge of the courtyard. Pulling the last two dollars out of her purse, she purchased a turkey sandwich and gave half to her daughter—who proceeded to devour it in three seconds flat.

Sandwich half in one hand, Desiree turned back to me. “What do you think, detective?”

“I’m . . . I’m not quite sure what to think,” I replied, still ruminating over the case. “It seems like the only difference between the two groups of palms is the variety planted. I may have to return to the office to do a little more research.”

A split-second before Desiree took her first bite of the turkey sandwich, her daughter tugged on her arm. “Um, mommy? I’m still hungry. May I have some more, please?”

For an instant, I saw in Desiree’s eyes a deep longing for a taste of that precious morsel of bread and deli meat. But without hesitating, she handed the other half of the sandwich to Eleanor.

“Here you go, sweetie. Go on over to the playground while the detective and I figure out how to make these palms--”

“Okay!” Eleanor giggled as she raced across the courtyard, the remainder of the sandwich in hand.

Desiree pivoted back to me, and with deep sincerity she confided, “I love her so much. I can give ‘til it hurts. Do you know what I mean, Detective?”

And that’s when it dawned on me. “I do. And I think, maybe, those palms know what you mean, too.”

*What does Detective Dendro mean?
Turn to page 63 to find out.*

Through the Eyes of the Ginkgo Tree

The science podcast *Generation Anthropocene* recently took a look at the history of the ginkgo tree. The discussion charts the rise and fall of this millennia-old plant, and the role human beings have had in its journey.

According to researchers, the tree was almost lost to extinction at one point. And yet, today, *Ginkgo biloba* is a common street tree, located in cities all over the globe.

This episode of *Generation Anthropocene* tracks the entire journey of the ginkgo, from its emergence to its decline, to its resurgence. The story is also partly based on a book by Sir Peter Crane, former dean of the Yale School of Forestry, entitled, *Ginkgo: The Tree that Time Forgot*.

Media type: audio podcast

Length: 18 minutes

Where to listen: www.genanthro.com/2017/05/09/ginkgo

MULTIMEDIA SPOTLIGHT



WHAT'S THE SOLUTION?

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I pointed to the canopies of the deficient trees. "Magnesium is highly mobile in palms, right? We saw how the trees were re-allocating their resources from the older fronds to the newer ones. But what we didn't consider was the fruit!"

I then pointed at the healthy 'Macho' palms. "*Phoenix dactylifera* is dioecious. Male (staminate) and female (pistillate) parts are found on separate trees. 'Macho' is the name by which the male trees are sold. Those male palms don't produce fruit, just flowers. The 'Medjool' palms are female; however, they were all allocating so much magnesium to their developing fruit that there wasn't enough left for the fronds."

Desiree's eyes lit up. She snapped her fingers with a grunt of understanding. "So those palms were giving 'til it hurt, huh? They were putting all of their mobile resources toward producing their fruit, their next generation!"

"Exactly," I continued, "and that's why those symptoms didn't appear in the male palms even though you used the same fertilizer application rate. The males were receiving adequate magnesium, but the females needed more to supply their developing fruits. You should consider increasing your fertilization rate for female *Phoenix* palms when they begin developing fruit or removing the fruit stalks before fruits begin to develop. Make sure to use a balanced, palm-specific fertilizer to avoid overcompensating and inducing deficiencies in other nutrients."

"Thank you so much, detective!" Desiree exhaled a sigh of relief, her expression turning optimistic. "Now I can give these palms the care they need. Although I won't be able to make these older fronds green up, we should see the appearance of the canopies improve within the next two years as newer fronds develop."

Later, as I walked back to the train, I thought to myself, *Sometimes we just have to give 'til it hurts . . . Maybe today's consult should be pro bono?*

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Photography courtesy of the authors.



Magnesium deficiency on *Phoenix dactylifera* fronds appears as chlorotic (yellow) marginal banding.

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