RESEARCH LABORATORY TECHNICAL REPORT

BARTLETT TREE EXPERTS
SCIENTIFIC TREE CARE SINCE 1907

Lethal Bronzing of Palm

Andrew L. Loyd, PhD, Plant Pathologist

Lethal bronzing of palm (formerly Texas Phoenix Palm Decline) is a vascular disease caused by a specific type of phytoplasma related to the pathogen that causes lethal yellowing of coconut. Phytoplasmas are bacteria that lack a cell wall and are restricted to the phloem tissue. The lethal bronzing causal agent can clog the vascular tissue of the palm, rapidly reducing vitality and leading to death. In the United States, the disease has been detected in Florida, Louisiana and Texas.

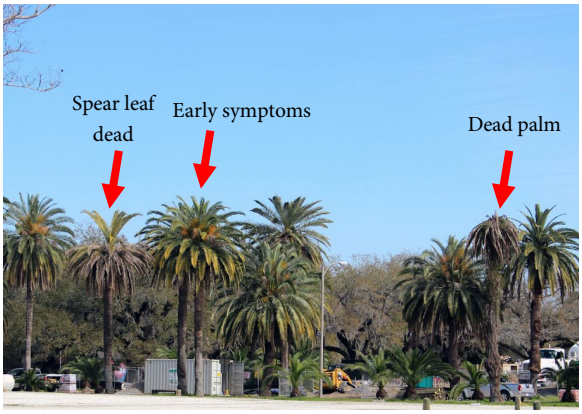
Symptoms

One of the first observed symptoms for lethal bronzing is premature flower or fruit death [1] (Figure 1). However, this symptom will only be observed on palms mature enough to produce fruit.

Figure 1: Prematurely dying flowers (arrows) due to lethal bronzing infection

Foliar symptoms can appear similar to severe potassium and magnesium deficiencies or symptoms observed with Ganoderma butt rot. Generally, foliage progresses from chlorotic (yellow) to necrotic (brown) and affects the older (lower crown) first, then the newer (upper crown) fronds [2] (Figure 2). The chlorosis is not observed in every palm species, but is common with infected *Phoenix* species.

Figure 2: Symptom development (arrows) of lethal bronzing affecting *Phoenix canariensis*



The spear leaf, the newest leaf, dies early in the infection process, often before the foliar symptoms have progressed to mid-canopy. Once the spear leaf is dead, the palm dies within months (Figure 3).

Causal Agent

The phytoplasma that causes lethal bronzing requires a host plant or insect vector to survive. Presumably, the vector that transmits the lethal bronzing phytoplasma to palms is the phloem-feeding planthopper *Haplaxius crudus* [3]. Other monocots such as turfgrass may harbor the phytoplasma and/or vector, creating a landscape inoculum source or a way to spread over long distances [4].

Host Range and Geographic Distribution

To date, lethal bronzing has been detected in 16 species of palms [1], but some hosts are more common than others. Date palms (*Phoenix canariensis, P. dactylifera, P. roebelinii,* and *P. sylvestris*), Sabal palms (*Sabal palmetto* and *S. mexicana*), and Queen palm (*Syagrus romanzoffiana*) are regularly reported.

Figure 3: *Sabal palmetto* with lethal bronzing
Photo credit: Monica Elliott, PhD

Lethal bronzing was first found in the U.S. on Canary Island Date palms in southeastern coastal Texas [5], but has since spread throughout the Florida peninsula and parts of the panhandle and has also been detected in New Orleans, Louisiana [1]. It is likely the disease has spread to other parts of the palm-growing regions of the U.S. as well.

Figure 4: Geographic distribution of lethal bronzing by county in FL, LA, and TX. Generated from data from UF EDIS PP243 and Texas Department of Agriculture (as of March 2020)

Management

Antibiotic injections with the active ingredient oxytetracycline-HCL have been effective in preventing lethal bronzing disease. Therapeutic injections for infected palms are highly variable in efficacy, and should be approached with caution. Therapeutic injections should only be completed if the spear leaf is alive and less than 25% of the crown is symptomatic. Preventive injections for non-infected palms are recommended for high value species (e.g., *Phoenix canariensis*) in areas where lethal bronzing has been documented (Figure 4). Samples should be sent for diagnostic testing for the lethal bronzing phytoplasma before treating with antibiotics. Please contact your Bartlett Arborist Representative to learn about management strategies.

References

[1] B. Bahder and E. Helmick, "Lethal Bronzing Disease (LBD)," UF IFAS EDIS, PP243, 2019. Accessed on: April 1, 2020. [Online]. Available: https://edis.ifas.ufl.edu/pp163

[2] N. Harrison, E. Helmick and M. Elliott, "Lethal yellowing-type diseases of palms associated with phytoplasmas newly identified in Florida, USA," *Annals of Applied Biology*, vol. 153, no. 1, pp. 85-94, 2008.

[3] L. Komondy et al., "The genomic analysis and phenology of Haplaxius crudus (Hemiptera: Cixiidae) in palm agroecosystems," in Entomology Society of America Conference, 2019.

[4] B. Bahder et al., "Disease progression of a lethal decline caused by the 16SrIV-D phytoplasma in Florida palms," Plant Pathology, vol. 67, no. 8, pp. 1821-1828, 2018.

[5] N. Harrison, M. Womack and M. Carpio, "Detection and characterization of a lethal yellowing (16SrIV) group phytoplasma in Canary Island date palms affected by lethal decline in Texas," Plant Disease, vol. 86, no. 6, pp. 676-681, 2002.