RESEARCH LABORATORY TECHNICAL REPORT

BARTLETT TREE EXPERTS
SCIENTIFIC TREE CARE SINCE 1907

Ganoderma Butt Rot

Andrew L. Loyd, PhD, Plant Pathologist

Palms are an extremely important group of plants for the landscape industry in many of the coastal areas in the southeastern and southwestern United States. In Florida, the most destructive problem for palms is Ganoderma butt rot, which is caused by the wood decay fungus *Ganoderma zonatum*. This fungus species is native to the southeastern United States, and is thought to have coevolved with cabbage palm, *Sabal palmetto*. It likely has a native, geographic distribution to the cabbage palm, although in the U.S. it has only been reported in Florida, Georgia, South Carolina and North Carolina. Outside of its native range it has been documented in southern California, likely being introduced on infected plant material from the southeastern U.S. When *Ganoderma zonatum* is diagnosed, palms should be removed immediately. This is because the fungus breaks down the lignin and cellulose of the lower trunk, predisposing palms to windthrow and failure and potentially damaging property and life.

Symptoms

When palms are infected with *G. zonatum*, typical symptoms are a general wilting of the canopy progressing from the lower fronds upward (Figure 1). In addition, symptoms can include an overall lack of vigor or decline resulting in slower growth and dead bottom fronds. These symptoms can be similar to other diseases and disorders such as severe nutrient deficiencies, lethal bronzing disease, or palm weevil damage. Ganoderma butt rot can only be validated in the field by observing the shelf-like fruiting bodies (Figure 2).

Figure 1: Ganoderma butt rot symptoms on *Butia odorata*

Figure 2: Fruiting bodies of *G. zonatum* on a palm trunk

Palm trunks and canopy tissue can weigh a significant amount, and when the lower trunk tissue loses structural integrity due to Ganoderma butt rot, the force of the load exceeds the strength of the trunk. As a result of this, palms with Ganoderma butt rot are subject to windthrow and failure at the base, which may result in damage to property and life.

Causal Agent

Ganoderma zonatum is a type of polypore that decays the tissue of highly lignified monocots. Polypores are a taxonomic group of fungi that form reproductive fruiting bodies which produce spores in tubes. When viewed from the bottom, these structures appear as pores (Figure 3). *Ganoderma zonatum* is a white rot fungus specializing in the decay of palms and other monocots such as bamboo. White rot fungi have enzymes that can break down both cellulose and lignin structural sugars in wood. In natural areas they are important nutrient recyclers. *Ganoderma zonatum* preferentially degrades lignin first, and can generally be found causing decay in the lower 4-5 feet of trunk tissues of palms since this is where the greatest concentration of lignin is present.

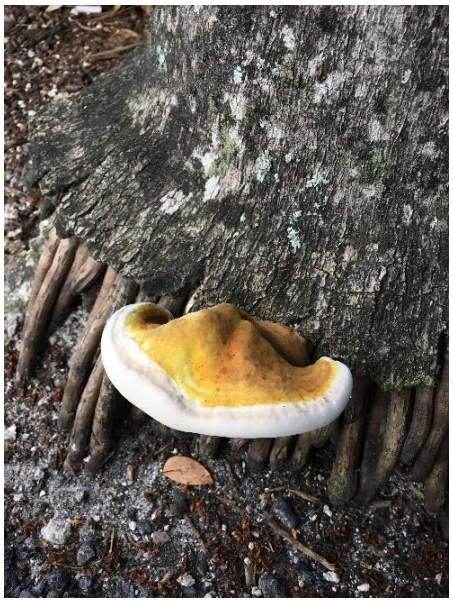
Figure 3: Underside and topside of *G. zonatum* fruiting bodies

Ganoderma zonatum produces fruiting bodies annually, and can be found fruiting throughout the year, but especially in the late summer and fall. A single fruiting body of *G. zonatum* can produce billions of spores in one growing season, and these spores are the primary source of spread. The spores are dispersed by wind, and can germinate and infect palm trunk tissue from the soil upward. While this fungus has been considered a pathogen, based on failed artificial inoculation attempts, it is more likely an opportunistic saprophyte.

Since palms are monocots, the vascular tissue, or water conducting tissues, are scattered in bundles throughout the trunk. As a result, palms can have significant trunk damage, and still have a healthy looking canopy. It is not known to what extent a palm can be infected with *G. zonatum* before canopy symptoms appear.

Other *Ganoderma* species have been observed decaying palm tissues in the southeastern U.S., but they do not appear to decay living palms as aggressively as *G. zonatum*. In Florida, the other *Ganoderma* species commonly encountered is a dull-capped species presumed to be *G. tornatum* (Figure 4). This species is rarely found on living palms, however.

Figure 4: Young fruiting body of *G. tornatum* on a dead palm



Management

There is no chemical treatment effective against Ganoderma butt rot. Keeping palms healthy and stress-free is the best management tool to prevent *G. zonatum* infections. This includes sound irrigation practices, proper planting depth, reducing construction damage, and maintaining appropriate nutrient

management programs. If *G. zonatum* is diagnosed on a palm, the palm should be removed immediately as they are prone to failure, especially during a storm. Palm stumps should be removed or ground immediately, as the fungus can fruit on dead stumps producing inoculum for adjacent palms.

Ganoderma zonatum can persist in woody debris in the soil and has been observed infecting newly planted palms installed in sites where previously infected palms have been removed. Since *G. zonatum* only infects palms, it would be wise to replant with a non-host. If a palm must be replaced in a site where a palm has died from Ganoderma butt rot, the soil should be excavated 6-9 feet away from the trunk and replaced with new fill soil prior to planting. This is a risky process as it is not a guarantee of preventing infections, and can present other challenges if the fill soil is a different texture than the site soil.

Monitor palms regularly for Ganoderma butt rot symptoms and fruiting structures. Removing infected palms before storms and hurricane season can reduce the risk of damage to property and life. Consult your local Bartlett Tree Experts Arborist Representative for a consultation and assessment of your palm trees.

Founded in 1926, The Bartlett Tree Research Laboratories is the research wing of Bartlett Tree Experts. Scientists here develop guidelines for all of the Company's services. The Lab also houses a state-of-the-art plant diagnostic clinic and provides vital technical support to Bartlett arborists and field staff for the benefit of our clients.