

Diagnosing Tree, Palm and Shrub Problems: Boron Deficiency and Washington Palms (*Washingtonia robusta*)

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Washington palm (*Washingtonia robusta*) is native to the dry desert of Mexico. It is adaptable to the hot humid climates of subtropical South Florida and in cooler areas of Central and North Florida. Its biggest landscape problems are Fusarium wilt, potassium deficiency and Ganoderma butt rot. Being one of the tallest features in the landscape, lightning strikes are sometimes responsible for ending the life of this palm.

Reported Situation

Quickly declining and dead Washington palms were reported along several block of an urban street. Eight palms were removed within three blocks of each other. These palms have been part of the neighborhood scenery for more than 30 years.



Washington palms in the vicinity of the affected palms.

Inspections and Findings

A visit was made to the site. The affected Washington palms stood between 40 to 60 feet tall. Not all the Washington palms were affected. Royal and cabbage palms growing nearby were not affected. Lightning strikes and Ganoderma butt rot were ruled out as the cause of the sudden decline and deaths of the palms. After the removal of two palms, their buds (meristems) were dissected and inspected for the possible cause of the problem. The dissected areas of both palms showed severe **boron deficiencies**. The embryonic leaves forming the growing point of the palms were bent as if pushed down on themselves, blackened, and necrotic at the tips. There was no foul odor which would normally indicate rot caused by a pathogen or disease. The dead meristem was responsible for the death of the entire palms. A healthy embryonic leaf should be white and straight, not blackened and twisted as pictured.



Street scene showing two dead Washington palms.



The dead top of a palm 50 feet in the air before the removal of the palm.



The meristem showing necrotic tips of emerging leaves.



A single embryonic leaf, dead at the top and twisted throughout its upper portion.



Demarcation between dead and living tissue

Symptoms of Boron Deficiencies in Washington Palms

- Emergent leaves may exhibit “accordion” pleating, although this condition by itself is not always diagnostic of B deficiency.
- New leaves display necrotic truncated leaflet tips
- Hook-like leaflets appearing at the tips of leaves
- Multiple unopened spear leaves.
- Leaves are greatly reduced in length and eventually only a necrotic petiole stub emerges.
- Leaflets are often stuck together.
- Acute asymmetrical distortion of leaf base.
- The absence of the normal toothed/spiny leaf petioles.



Asymmetrical leaf bases and toothless petiole caused by B deficiency.



Normal symmetric leaf base and sharp teeth on petiole of Washington palm.

Conclusions

Boron deficiency is caused by insufficient B in the soil. Boron is readily leached through most soils, with a single heavy rain event temporarily leaching most available B out of the root zone. When this leaching stops, B released from decomposing organic matter will again provide adequate B for normal palm growth. These transient B deficiencies are of no concern to palm health as they are self-correcting. Only the chronic B deficiencies, caused by soil drying and high soil pH, affect the health of the palm.

Moderate to severe cases of B deficiency should be treated as soon as possible. Boron deficiency should be corrected within six months following treatment. [Click here](#) for information on B fertilizer sources and applications.

Palm Links

Broschat, T. K. 2014. [Manganese Deficiency in Palms](#). ENH1015. UF/IFAS, Gainesville, Florida

Broschat, T. K., 2014. [Potassium Deficiency in Palms](#). ENH1017. UF/IFAS, Gainesville, Florida

Broschat, T. K. 2013. [Washingtonia robusta: Mexican Fan Palm](#). ENH-827. UF/IFAS, Gainesville, Florida

Broschat, T. K. 2005. [Boron Deficiency in Palms](#). ENH1012. UF/IFAS, Gainesville, Florida

Brown, S. 2014. [Lightning Strikes on Coconut and Royal Palms](#). UF/IFAS, Lee County Extension, Fort Myers, Florida

Brown, S. 2012. [Florida Native Palms](#). UF/IFAS, Lee County Extension, Fort Myers, Florida

Brown, S. 2011. [Root Initials of Some Common Florida Palms](#). UF/IFAS, Lee County Extension, Fort Myers, Florida

Brown, S. and T. K. Broschat. 2006. [Major Palm Nutrient Deficiency Symptoms and Fertilizer Applications](#). UF/IFAS, Lee County Extension, Fort Myers, Florida

[Palm Diseases and Plant Pathology Page](#). Fort Lauderdale Research and Education Center

Tree Links

[Eucalyptus Trees found in South Florida](#)

[Native Plants Fact Sheets](#)

[Shade Trees for South Florida](#)

[Small Trees for South Florida](#)

All pictures were taken by Stephen H. Brown

This fact sheet was reviewed by Timothy K. Broschat, Fort Lauderdale REC; and Peggy Cruz, Lee County Extension Service.

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