Palm Trees and Boron

Palm trees being crucial plants in tropical environments, require the micronutrient boron to thrive. They can build disfiguring if not given enough boron.


Palm Trees

NEW YORK, USA, June 26, 2022 /EINPresswire.com/ -- Early detection and diagnosis of boron deficiency are essential for keeping these trees healthy. Palm trees, when properly cared for, can be a lovely and exotic addition to any home or garden.

Palm trees are an integral part of many landscapes in tropical regions. They provide a lush, green backdrop and can be highly versatile, with many different uses besides being decorative.

Coconut palms (Cocos nucifera) are particularly popular for their aesthetic value and the edible nuts they produce. These nuts are the main food staple in many Pacific Island societies and an essential ingredient in various cooked and processed foods worldwide.

Other palm tree parts are the stem xylem, used in furniture or baskets; the edible heart of the palm, a vegetable produced from the inner core of particular palms; palm sap, fermented to make palm wine; and coconut husks, which are made up of fibers and are used to make brushes, ropes, furniture upholstery, and plant growth media.

In Hawai'i, palm trees are commonly found in native forests, botanical gardens, and sandy beaches. However, these often suffer from deficiencies in potassium, magnesium, and boron, mainly due to improper care.

Boron deficiency is one of the most common palm deficiencies in Hawai'i. It limits and distorts foliar growth in many palm species.

Boron in Palm Trees
Boron is an essential micronutrient involved in numerous cellular functions. It helps to balance carbohydrate levels and facilitates their movement through the vascular systems of palm trees. Boron also aids in the development of healthy cell walls during root and bud-tip cell division and

the transport of water-regulating potassium to the cells.

The best soil for palm trees includes organic boron, a byproduct of vegetative decomposition, or an inorganic form combined with calcium, sodium, or magnesium. This ensures that palm trees have adequate nutrient levels for optimal growth and health.

Symptoms of Boron Deficiency

Boron deficiency may cause various symptoms in palm trees, and these symptoms can vary even within a single species. Symptoms usually first appear on newly emerging leaves, but they can also be seen on older leaves as they mature and are replaced by new growth.

The earliest signs of boron deficiency in plants are transverse translucent streaking or puckering on the leaflets. This symptom may be seen in Areca (Dypsis lutescens) and Queen (Syagrus romanzoffiana) plants. In some cases, such as Coconut (Cocos nucifera), African oil (Elaeis guineensis), and S. romanzoffiana, mild boron deficiency may manifest as sharply bent leaflet tips referred to as hook leaf.

In some cases, these hooks may fall off entirely. Another sign of chronic boron deficiency is the formation of weak, narrow leaflets near the tips of newly emerging leaves. These leaflets frequently fall off, leaving the rachis tip leafless.

Boron deficiency can cause necrosis of developing leaves, resulting in a triangular truncation of the leaf tip. This pattern can be repeated multiple times when producing a single leaf of coconut.

Another common symptom of boron deficiency is the inability of newly emerging spear leaves to open normally. These can be tightly bonded along their length, or the fusion can be limited to the spear leaf's basal or distal parts. Multiple unopened spear leaves can be seen at the canopy's apex in a chronic situation.

The most unusual boron deficiency symptoms include crown bending in one direction (epinasty), twisting of petioles and leaves, and sharp bends in the petiole. These symptoms are caused by a decrease in indoleacetic acid oxidase activity and high auxin levels in the leaves. Boron deficiency may even lead to branching in species that don't branch.

Occurrence of Boron Deficiency

Boron deficiency is a major issue for palms growing in wet climates worldwide. After heavy rains in the mid-2000s, it became a widespread problem in Florida. Boron deficiency has been observed in container-grown palms, but it is relatively uncommon in this environment.

Boron Absorption-Favorable Conditions

Boron is an essential trace mineral for palm trees, and the proper cultural requirements can help palm trees absorb this vital nutrient. Boron is generally more available to palm trees in acidic

soils with pH levels below 7.0 than in higher pH, alkaline, or limestone-rich soils. Furthermore, nitrogen deficiency can interfere with trees' boron and other trace mineral uptake.

This problem can be alleviated by using a slow-release, 3-1-3 fertilizer regularly. Finally, excessive rain or irrigation can leach boron from the soil, while drought can deprive the roots of the moisture they require to absorb this mineral. As a result, it is critical to keep the soil consistently moist but not saturated to maximize boron levels and availability.

Preventing Boron Deficiency
Applying fertilizer and keeping palm trees properly irrigated can help prevent the development of boron deficiency symptoms. Palm fertilizers containing all minor elements, including boron, should be applied twice a year. However, even with regular applications of boron-containing palm fertilizers, symptoms of boron deficiency may still develop in some cases.

Irrigating fertilized palms is especially important in low-rainfall areas to bring the elements into an aqueous solution or suspension in the rhizosphere and make them accessible for uptake by palm roots.

Boron deficiency is more common in highly wet or extremely dry areas and sandy or rocky soils. As a preventive measure, these areas may require more frequent boron applications. For example, the City and County of Honolulu's Board of Water Supply reports that annual rainfall range from 48 to 98 inches annually along the Ko'olau Mountain Range at elevations ranging from 150 to 3,000 feet above sea level.

Many of Oahu's windward coast cities receive more than 100 inches of rain per year. The majority of the high-rainfall areas are on the windward side of the Ko'olau mountains, but others are on the leeward side. Mänoa Valley, Moanalua, and Nu'uanu, for example, have high annual rainfalls.

Treating Boron Deficiency
It is essential to be patient when treating existing boron deficiency. A solution of one-quarter to one-half cup sodium borate, also known as borax, soaked into the soil around an affected palm from the trunk to the drip line may cure the problem. Its effectiveness, however, will not be apparent for at least five months.

Brendan McMahon
BORATES TODAY
editor@borates.today
