

## Potassium Deficiency in Palm

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Potassium deficiency is commonly observed in palm trees across landscapes in leached, sandy soils. It has been said that potassium deficiency is the most widespread of all the nutrient deficiencies in palms. In coastal regions of the southeastern United States, it is of particular concern and may result in death when severe. Potassium plays a large role in maintaining water conduction of the plant as it is involved in controlling the opening and closing of stomata. Since the stomatal opening also regulates the availability of carbon dioxide, potassium has an indirect effect on photosynthesis. Potassium is also required for translocation of carbohydrates within the plant. As a result, when plants are potassium-deficient, sugars produced by photosynthesis accumulate where they are produced, resulting in stunted growth. Cell wall integrity is also reduced with limited potassium which can cause a higher likelihood of leaf breakage.

### Symptoms

Although symptoms may vary among species, there are some common characteristics of potassium deficiency in palms that are diagnostic. Since potassium is mobile within plants, deficiency symptoms will always begin on the older, lowest leaves first. These symptoms may start as yellow to orange translucent spots on the oldest leaves of some species (Figure 1). These symptoms progress into tip or marginal necrosis (scorching) as deficiencies worsen (Figure 2). Some species may never display the spotting symptom, but rather begin with marginal necrosis symptoms.

**Figure 1: Early potassium deficiency shown as yellow to orange spotting of foliage**



Palms suffering from prolonged potassium deficiencies may have smaller canopies, made up almost entirely of chlorotic or necrotic foliage (Figure 3). Because of the effects on growth, these palms may also have a tapered trunk.

**Figure 2: More advanced potassium deficiency with scorched older foliage**



## Treatment

Care must be taken in overcoming potassium deficiency because there are many interactions with other nutrients that can limit potassium availability to the plant. If the plant is treated with the wrong fertilizer, the problem could be worsened. The cause of the deficiency could be caused by insufficient nutrients in the soil, pH, or other chemical imbalances in the soil. Other cultural factors, such as root disease or planting problems, can exacerbate the problem and should also be addressed. Consult your local Bartlett Arborist Representative for a consultation and assessment of your palm trees.

To identify the cause of potassium deficiency, a soil chemistry analysis should be performed to determine the levels of individual nutrients, pH, organic matter, and nutrient retention capacity of the soil. Treatment may involve applications of specifically prescribed palm fertilizers based on soil analysis. Fertilizers must be derived from slow-release components as other types of fertilizers can result in peaks of nutrient availability followed by periods of shortages. The applications should be applied every three months in order to deliver a consistent supply of nutrients to the plant.

It will take at least one to two seasons under a fertilization program for the canopy of severely deficient palms to recover as the older foliage will not improve. The newly produced foliage will replace the older foliage, but it will need to be kept healthy under a fertilization program to prevent symptom re-development as it ages.

**Figure 3: Severe potassium deficiency where only the newest foliage is green and all older foliage is scorched**



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