

Nutrient Deficiency Symptoms of Woody Ornamental Plants in South Florida¹

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Ornamental trees and shrubs are grown primarily for functional and aesthetic purposes. Nutritional deficiencies can affect a plant's ability to perform its function in the landscape and certainly can reduce its aesthetic value. Although about 16 elements are required for normal plant growth, only a few of these elements are commonly deficient in Florida landscape plants. The purpose of this document is to describe and illustrate typical symptoms for common nutrient deficiencies in trees and shrubs grown in south Florida landscapes.

Nitrogen (N)

Nitrogen is the predominant element applied in most landscape fertilizers, yet N deficiency is actually quite rare in landscape trees and shrubs. Symptoms appear first, and are most severe, on the oldest leaves as a uniform light green or yellow coloration (Figure 1). As the deficiency progresses, the entire plant quickly becomes light green in color and growth rate declines sharply (Figure 2).



Figure 1. Early nitrogen deficiency of China doll (*Radermachera sinensis*).



Figure 2. Advanced nitrogen deficiency on canistel (*Pouteria campechiana*).

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Phosphorus (P)

Phosphorus deficiency is quite rare in Florida landscape plants. However, It is fairly common in firebush (*Hamelia patens*) and very common in combination with potassium (K) deficiency in *Ixora* sp. Phosphorus deficiency appears as a uniform wine-red coloration on the oldest leaves of plants whose leaves naturally contain anthocyanin pigments (Figure 3). In other species, however, older leaves will be light yellow-green in color. Phosphorus-deficient plants are typically severely stunted compared to normal plants. In *ixora*, P deficiency, in combination with K deficiency, results in diffuse reddish spotting on the oldest leaves (Figure 4).



Figure 3. Phosphorus deficiency in firebush (*Hamelia patens*).



Figure 4. Potassium/phosphorus deficiency on *Ixora* Nora Grant

Potassium (K)

Potassium deficiency is occasionally seen on trees and shrubs, especially in south Florida. Symptoms occur on the oldest leaves as necrotic spotting, interveinal chlorosis and necrosis, or marginal necrosis, depending on the species and severity (Figures 5–7). It is very common on orchid

trees (*Bauhinia* sp.), especially in the months just prior to leaf drop (Figure 8).



Figure 5. Potassium deficiency in mango (*Mangifera indica*).



Figure 6. Potassium deficiency in black olive (*Bucida buceras*).



Figure 7. Potassium deficiency in *Eucalyptus torelliana*.



Figure 8. Potassium deficiency in orchid tree (*Bauhinia variegata*).

Magnesium (Mg)

Magnesium deficiency is probably the most common of all nutritional deficiencies on trees and shrubs throughout the state of Florida. Symptoms are most severe on the oldest leaves and appear as broad interveinal and/or marginal chlorosis, but not necrosis (Figures 9–12). Severely deficient plants will drop their lower leaves (Figure 13). Growth rate will be greatly reduced in such plants and a reduction in leaf size will also be observed.



Figure 9. Magnesium deficiency in rose.



Figure 10. Magnesium deficiency in umbrella tree (*Schefflera actinophylla*).



Figure 11. Magnesium-deficient older leaves of allamanda (*Allamanda cathartica*).



Figure 12. Magnesium-deficient older leaf of *Lonchocarpus* sp.



Figure 13. Severe magnesium deficiency in dwarf allamanda (*Allamanda cathartica* Hendersonii) showing loss of older leaves.

Iron (Fe)

Iron deficiency is common on trees and shrubs growing on alkaline or poorly drained soils. Plants with root problems caused by mechanical injury, root rot diseases, or nematodes may also exhibit Fe deficiency symptoms. Symptoms appear on newly emerging leaves as a sharply delimited interveinal chlorosis (Figure 14). In severe cases, new leaves may emerge reduced in size and nearly white in color, often with necrotic spotting (Figures 15–16).



Figure 14. Iron deficiency in orchid tree (*Bauhinia variegata*).



Figure 15. Severe iron deficiency in *Lonchocarpus* sp.



Figure 16. Severe iron deficiency in *Ixora* sp.

Manganese (Mn)

Manganese deficiency symptoms are occasionally observed on plants growing in alkaline or highly leached soils. Symptoms appear on newly expanding leaves and vary among species. For most species, Mn-deficient leaves exhibit a diffuse interveinal chlorosis with poorly defined green areas around the veins (Figure 17). Chlorotic, and often necrotic, spotting are common symptoms. As the deficiency progresses, new leaves become tiny, and tip die-back can occur (Figure 18). In some species such as *Ficus microcarpa*, new leaves emerge almost uniformly chlorotic with symptoms identical to those of Fe deficiency (Figure 19).



Figure 17. Manganese deficiency in *Schefflera octaphylla*.



Figure 18. Severe manganese deficiency in downy jasmine (*Jasminum multiflorum*).



Figure 19. Manganese deficiency in Indian laurel (*Ficus microcarpa*).

Boron (B)

Boron deficiency is rather rare in trees and shrubs but has been observed regularly in Chinese hibiscus (*Hibiscus rosa-sinensis*). Symptoms appear on the new growth as small, upwardly cupped or puckered, dark green, brittle leaves with short internodes (Figures 20 and 21). It may result in a rosette effect or even shoot die-back (Figure 22). Boron deficiency is caused by leaching on sandy soils, but by drying or high pH on other soil types.



Figure 20. Cupped new leaves of boron-deficient Chinese hibiscus (*Hibiscus rosa-sinensis*).



Figure 21. Puckered new leaves of boron-deficient Chinese hibiscus (*Hibiscus rosa-sinensis*).



Figure 22. Rosetting caused by boron deficiency in Chinese hibiscus (*Hibiscus rosa-sinensis*).