



Iron Deficiency

Iron deficiency is the most common micronutrient deficiency. Symptoms first appear on young leaves with yellowing between the leaf veins (interveinal chlorosis). In severe cases, entire leaves may turn white and outer edges may turn brown to black as plant cells die. A single limb or one area of a tree may be affected while the remainder appears normal.



Yellow leaves indicate a lack of chlorophyll which is a green pigment essential for photosynthesis. Less chlorophyll results in less sugar production causing reduced plant growth and often smaller, poor quality fruits that may be bitter. If chlorosis is severe or long term, individual limbs or the entire plant may die.

Iron chlorosis is common in alkaline soils (pH greater than 7.0) although these soils typically contain plenty of iron. pH is not the only factor making the iron unavailable to plants as other factors can affect iron availability. Iron chemistry in soil is complex but cool soil temperatures and restricted air movement through the soil due to compaction and water saturation are two more factors. Urban soils that have been leveled or compacted for housing developments or where topsoil has been removed leaving subsoil with lime are examples. Other contributing factors to consider are alkaline irrigation water, plant competition, girdling roots and winter injury.

To avoid damage to landscape plants, always have your soil tested for pH before adding amendments. Lowering the pH of strongly alkaline soils (pH greater than 7.3) is very difficult. Soil pH can sometimes be temporarily lowered by adding elemental sulfur. Sulfur is converted to sulfuric acid by soil bacteria and may require months before a change is noticed. The conversion rate of sulfur is dependent on the fineness of the product, the amount of soil moisture, soil temperature and the presence of the bacteria. The acidifying effect is localized and temporary, making repeated applications necessary. However, adding sulfur at high rates or applying it too frequently can damage your plants.

pH-induced iron deficiency is correctable, but requires treatment with iron chelated with EDDTA, not the more common, less expensive EDHA. A chelate slows the interaction with the soil and prolongs the availability of the iron. A correct watering regimen is also important, as overwatering will exacerbate the iron problem. Two commercial products available to homeowners are Sprint 138 Iron Chelate and Sequestrene 330 Iron Chelate. Other nutrient deficiencies common to alkaline soils are manganese, zinc, copper and boron. It is best to select plants that are tolerant of high pH conditions to avoid chronic plant nutrition problems.

References:

Abiotic Disorders of Landscape Plants, A Diagnostic Guide – L. R. Costello et. al.

Arborculture: Integrated Management of Landscape Trees, Shrubs, and Vines – R. W. Harris, J. R. Clark, N. P. Matheny

Preventing and Treating Iron Chlorosis in Trees and Shrubs – Michael Kuhns and Rich Koenig
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