Chlorosis: A summary of recommended steps to correction

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This tree is chlorotic due to stress. The concrete covering its roots is preventing root growth and nutrient uptake. The same problem occurs when the roots of trees are covered with plastic or other impermeable materials.

As chlorosis becomes more severe, edges of leaves may scorch or areas within the leaf blade may develop necrotic (dead) tissue. Tip die-back of twigs and branches is an advanced stage of chlorosis.

Introduction

Chlorosis is the yellowing of tissue resulting from the failure of chlorophyll to develop. This may be caused by a deficiency of an essential nutrient or some other cause. Some plants develop chlorotic leaf tissue due to their genetics; many of these plants are marketed through the nursery industry due to their unique coloration. Plants of with this genetic characteristic may be more sensitive to leaf scorch.

Leaves of chlorotic plants range in color from light green through yellow to almost white. Many people automatically assume this is caused by an iron (Fe) deficiency. However, lack of iron may not be the reason for the chlorosis.

The following chlorosis-inducing factors should be ruled out before drawing the conclusion the problem is Fe-deficiency induced. Accurate and rapid identification of the problem is paramount. A soil test should be conducted to determine if a nutrient deficiency is a problem.

Causes of Chlorosis

- natural senescence
- nutrient factors:
    - N deficiencies and excesses;
    - S deficiencies
    - K deficiencies and excesses
    - B deficiencies and excesses
    - Ca deficiencies
    - CI and Cu deficiencies
    - Zn deficiencies
    - Mg deficiencies
    - Mn deficiencies and excesses

    - Excess levels of Phosphorus (P)
- damage from sterilants such as Krovar, Ureabor, Pramitol, atrazine, and simazine;
- damage from root rots, viruses, root feeding insects, and vascular wilt diseases.

Correction

If the problem is identified as Fe-deficiency chlorosis, the following chlorosis-inducing environmental factors need to be checked out and alleviated if possible before treating with an iron product:

- soil moisture excesses and deficits;
- heavy herbaceous vegetation such as sod-forming grasses over the root zone;
- fine soil structure, soil compaction, and sealing of the soil surface;
- excessive soil organic matter;
- excessive salt levels;
- high soil Cr, Ni, Zn, Cu, and Co levels;
- high soil temperatures;
- the use of nitrate nitrogen fertilizers; and
- high bicarbonate levels in soil and irrigation water.

Chelates

Soil applications of Fe-EDDHA in accordance with label directions are recommended only when the chlorotic conditions are due to a deficiency of iron in the soil. Such applications should be made in the spring to achieve the most effective results. Foliar applications of iron products are very short lived but may be helpful. Chelates are usually photosensitive and thus should be applied in the evening hours to increase uptake prior to breakdown by daylight. The best results will be obtained when following label directions when applying these products.

If a chelate treatment does not solve the chlorosis problem, the plant may die and a replacement be needed. When selecting a replacement, plants and/or rootstocks should be chosen which are resistant to Fe deficiency-induced chlorosis.

Applications of chelated iron when not needed result in deficiencies of other micro-nutrients.

Soil and tissue analyses can be helpful in determining nutrient deficiencies. Your local Extension office should be able to recommend a lab facility that can conduct a tissue sample for you.

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