

11. IRON

Unlike most deficiencies, iron deficiencies are usually not related to a low amount of the element in the soil but are brought on by one or more other factors. Some of the factors that can cause or contribute to iron deficiency are:

- Lime in soil (lime induced chlorosis)
- Bicarbonate in soil and/or water
- Cool soils
- Wet soils
- High phosphorus content of soils
- High zinc (and Mn) levels in soil at low pH

In many instances, iron deficiency could be called by other names, such as lime induced chlorosis, bicarbonate chlorosis, and cool, wet soil chlorosis. It would still be iron deficiency, but the different names indicate that different methods can be used to attack the problem.

Many crops will show symptoms of iron deficiency (interveinal chlorosis of foliage) in the spring of the year when soils are cool and wet and the deficiency will correct itself as the weather becomes warmer. Mild iron deficiency during a cool spring has resulted in the sale of many pounds of nitrogen fertilizer in the past and will continue to do so in the future. A mild case of iron deficiency can be mistaken for nitrogen deficiency; the grower applies nitrogen fertilizer, the weather warms up, the plants turn green and the grower and the fertilizer salesman congratulate themselves for a job well done.

For crops known to be susceptible to iron deficiency, water management should be watched closely, especially during cool weather such as occurs in the spring. Don't apply water unless needed.

I observed a zinc induced iron deficiency on almonds a few years back that was aggravated by low soil pH. The soil was a loamy sand, the grower had applied zinc religiously 2 or more times a year and soil pH was in the 4.5 range. Zinc levels in the soil had built up over the years and the zinc was very soluble at the low pH. Although the tree symptoms were typical of iron deficiency (metallic nutrients compete for entry into the plant) it would not be improper to call them zinc toxicity symptoms. Lime application and cutting back on zinc corrected the problem.

Application of acidifying amendments to the water and/or soil is sometimes helpful for lime and bicarbonate chlorosis.

Gypsum application can also be helpful in relieving iron chlorosis. Gypsum alleviates

water logged soils and also reacts with bicarbonate and phosphorus to reduce their levels.

Diagnosing iron deficiency is best done visually trust the eyes. Plant analysis for iron is of little help and can give misleading information. High phosphorus levels in plant tissue are often associated with iron deficiency; high potassium levels are sometimes associated with the deficiency.

Application of iron materials, either soil or foliar, should only be tried if all other methods of correction fail. Foliar sprays are the most common chemical method of correcting iron deficiency. Soil applications of chelated materials can provide correction in some cases, but are expensive. Materials other than chelates are rarely used for soil application because they are readily fixed in an unavailable form in most soils. Improving soil aeration is often more effective than adding iron materials.