

Chlorosis is one of the most misunderstood and misdiagnosed problems encountered in gardening. It is the yellowing of leaves, but has a variety of causes, including disease, sucking insects or too much shade. Chlorosis may also be caused by root damage due to poor drainage, over watering, under watering or excess chemical fertilizers. Once you eliminate these conditions, the leaves and stems of your plants should turn green again. However, yellowing of leaves may also indicate a nutrient deficiency, such as nitrogen or iron.

Nutrients come in two forms - mobile nutrients and immobile nutrients. The mobile nutrients are nitrogen, phosphorus, potassium and magnesium. These nutrients can move quickly from the soil to the plant. The immobile nutrients are iron, sulfur, calcium, manganese, copper, zinc, boron, molybdenum and chlorine. Their movement is determined by their electrical charge, typically positive. If positive, the nutrients bind with the soil and become unavailable. The determining factor for this availability is the soil's pH. Most become more available to plants within a particular pH range. In the desert southwest, our alkaline soils start out with high pH. The high salt content in our water, which has increased dramatically over the past few years, aggravates this problem.

Organic matter will lower pH slightly to moderately. Compost is more neutral, but peat, sawdust, pine needles or chippings will reduce pH more dramatically. Sulfates will generally lower pH; ammonium sulfate (a common source of nitrogen in fertilizer mixes), iron sulfate (Ironite®), magnesium sulfate (Epsom salt) will reduce pH, although potassium sulfate is neutral. Sulfur is also a direct way of reducing a high pH. However, we recommend chelated forms of sulfur and nitrogen to prevent them from becoming unavailable by binding to the soil. Many of the products we recommend and add to our soils as nutrient supplements have the added effect of reducing pH.

If the plant is nitrogen-deficient, the old leaves are uniformly yellow and the new growth, though green, may be stunted. Iron is one of the chief elements necessary for the production of chlorophyll - the molecule that makes green plants green. It also aids sugar burning enzymes which activate nitrogen fixation. And it regulates the respiration of the plant's cells. All-in-all, iron is an essential element to the rose. This condition is repaired by amending the soil regularly with organic nutrients such as blood meal, cottonseed meal, compost, coffee grounds and fish emulsion. For a more rapid remedy, apply a high-nitrogen commercial fertilizer to the soil.

If a plant is iron-deficient, its newer leaves are more yellow than its older ones, and, characteristically, instead of the entire leaf turning yellow, the leaf margins and the tissue between the veins turn light in color, while the veins themselves remain dark green. This is a very common problem. Iron may be present in your soil but unavailable to plants mainly because they require an acid soil in order to absorb the mineral. The remedy for iron chlorosis is to improve and acidify the soil. Apply organic iron sources such as compost, chicken manure, peat moss, pine needles or oak leaves. A quick remedy is spraying the foliage with a seaweed extract like Maxsea or an iron chelate every two weeks and applying a specialized acid fertilizer to acidify the soil.

Although chlorosis can occur in plants no matter their environment, it occurs more quickly in container grown plants. Container plants need to be fed at half strength, but be mindful that over watering washes the nutrients out more quickly. Chlorosis, left untreated, can progress to a severe state where the plants turn almost white, wilt and die.