



What leaves can tell you about a plant's health

by Rosie Bonar, UC Master Gardener

Plants are living organisms. Green plants are essentially living factories that produce their food using photosynthesis. Photosynthesis is the process by which plant cells, in the presence of chlorophyll and light, convert carbon dioxide and water into carbohydrates. Leaves provide the surface area needed for the plant to collect sunlight and conduct photosynthesis.

The leaves are also the part of the plant that we see most easily. Because of that, we can observe the leaf and learn about the plant's health, --if we know and recognize the signs to look for. We can see signs of stress from nutrient deficiency, too much or too little water, and insect damage.

Nutrient Deficiency

Plants need the right combination of nutrients to live, grow and reproduce. When plants suffer from malnutrition, they show symptoms of being unhealthy. There are 17 nutrient elements essential for plant growth and development.

They fall into two categories: macronutrients and micronutrients. Macronutrients are those elements that are needed in relatively large amounts. They include nitrogen, potassium, sulfur, calcium, magnesium and phosphorus. Micronutrients are those elements that plants need in small amounts (sometimes trace amounts), like iron, boron, manganese, zinc, copper, chlorine and molybdenum.

Both macro- and micronutrients are naturally obtained by the roots from the soil. If these nutrients are not available to the plant, the plant will show symptoms of stress. If we can recognize these symptoms, we can supply the missing nutrient.



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- yellow-green color of older leaves, especially the tips and center vein, indicates nitrogen deficiency
- purplish or dark green color with dying leaf tips indicates phosphorus deficiency
- wilted or burnt looking leaves and sometimes yellowing between the veins indicates potassium deficiency

These three elements are the easiest to obtain because they are the elements found in plant food that can be purchased at any nursery. N/P/K means nitrogen / phosphorus / potassium.

Micronutrients can also be supplemented by foliar sprays or granules applied to the soil.



- Yellowing between the veins in young leaves indicates iron deficiency. This is fairly common in our area. Overwatering and soil compaction are often the cause of iron deficiency.
- Yellowing between the veins and decrease in stem length with the terminal leaves making a rosette is an indication of zinc deficiency

Water Stress

Most plants show moisture stress symptoms when they are too dry.

- Smaller than normal leaves that may be wilted, folded or misshapen, dull gray-green in color, and may turn brown from the outside in and may drop are signs of too little water. The leaves appear brittle.

But plants sometimes show similar symptoms when they are over-watered.

- Wilted and yellowing of leaves are a sign of overwatering (and also nitrogen deficiency.) Both young and old leaves may fall from the plant. The leaves appear limp.

Testing the soil with a moisture meter can help determine the water status down at the roots of the plant.

Insect Damage

Using a pesticide to kill insect pests should only be done as a last resort. Most insect damage does not kill the plant and killing insect pests also kills the beneficial insects. Monitor the damage, spray with water, prune the damage and wait to see what happens.

- off-color patches, winding trails or holes in leaves are caused by the larvae of moths or other insects
- holes in leaves are caused by chewing insects

This is not all that we can tell from careful observation of leaves. But it gives you an idea of the ways that evidence of nutrition, water and the presence of insects can be seen on the leaves of plants. Careful horticultural practices can help immensely in the overall health of a plant.

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