

**Local Trees Turning Color Early**  
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Nutrient deficiency in plants causes many symptoms ranging from yellow to purple leaves and can be found on plant species. Deficiencies can result in many symptoms depending on which nutrient is the limiting factor. Think of plant nutrition as being a barrel with a broken stave. Liquid will flow out where the barrel is broken and only get that full. Until the stave is repaired the barrel will never be full. Plants with nutrient deficiencies work in the same manner; if a nutrient is limited then the plant can only produce until the nutrient is used up.

Symptoms of nutrition deficiency are dependent on what element is lacking. Nitrogen deficiency will result in older leaves becoming chlorotic (yellow) or even necrotic (dead), with new leaves being green in color. This is because nitrogen is mobile within the plant and new leaves need the nitrogen more than older leaves as they provide more sugar production. Phosphorus deficiency causes the foliage to turn a greenish purple color, especially at the leaf margins. This is what causes purple sweet corn. Potassium deficient plants will show mottled or chlorotic leaves with small necrotic spots close to the leaf tips and margins. Plants deficient in iron will have interveinal chlorosis (yellow leaves with dark green veins). This occurs because iron is the central element in the chlorophyll molecule and used in the leaf as soon as it can.

Iron chlorosis is a big problem in our area, not because our soils lack iron, but because some plants have a hard time extracting iron in alkaline soils. This happens often on maple, crabapple, aspen, and oak as well as other species. If you find that iron chlorosis is a problem with your plants you can fertilize using any product containing iron sulfate. The idea here is that if extra iron is available then the plant may be able to use it. You can also spray the foliage with iron sulfate and the plant will use this iron very quickly.

Other deficiencies can be overcome by fertilizing. Looking at any fertilizer package you can tell what nutrients are added when using that product. Every fertilizer has a commercial analysis of three numbers separated by dashes. For example a 10-10-10 (N-P-K) fertilizer contains 10% elemental nitrogen, 10% phosphoric oxide ( $P_2O_5$ ), and 10% potassium oxide ( $K_2O$ ). A 50-pound bag of this product will have 5 pounds of each of these. In elemental terms there will be 2.2 pounds of phosphorus and 4.2 pounds of potassium.

If in doubt whether or not your plants are suffering from nutrient deficiency you can call on your county extension office or have a plant sample analyzed for nutrients. A soil test is a good idea before any fertilization as fertilizing when not needed or in excess amounts is a waste of time and money. In addition to the cost extra fertilizer can cause other problems in the development of plants. Soil test kits are available at your county extension office and can be sent to the soil-testing lab of your choice for a small fee. The kits have detailed instructions and soil bags to ship samples in.

More information on horticultural topics can be found by visiting us online 24 hours a day on the Pennington County Extension web site at [www.co.pennington.sd.us/extension/extsvc.html](http://www.co.pennington.sd.us/extension/extsvc.html), or by calling 605-394-2188 or by e-mailing [ricky.abrahamson@sdstate.edu](mailto:ricky.abrahamson@sdstate.edu).