

Adequate nutrients make for happy plants and gardeners



Saisett Aflo | Shutterstock.com

Oh great, what now? Some of the plants in my vegetable garden and landscape look sick! If this sounds familiar, read on.

A multitude of insect, disease, and environmental issues affect plants in Wyoming. Many beginning growers don't realize that nutrient deficiencies are another common cause of sick-looking plants.

Nutrient deficiencies occur when plants do not receive the required amount of macro and/or micronutrients for normal plant function. Plants require specific nutrients to carry out important functions, such as proper growth and fruit production. Nutrient deficiencies can reduce crop yields and negatively impact plant health, not to mention they often make plants look plain old sick.

There are two reasons a deficiency may occur: 1) nutrients are present, but not accessible due to the pH or the chemistry of the soil or 2) the soil physically lacks certain nutrients.

Soil pH issues

Nutrient deficiencies related to pH occur when minerals become more or less available to plants due to soil acidity or alkalinity. When the pH is 7 (neutral), most of the macro and micronutrients are available in the soil. Nutrient

availability changes as the pH moves away from 7 in either direction (acidic or alkaline).

Generally speaking, native Wyoming soils tend to be on the alkaline side of the pH scale, between 7.5 and 8.5. While there are exceptions, it is not uncommon for Wyoming growers to encounter plant health issues related to high pH values.

Figure 2 shows micro and macronutrients that might be present or lacking depending on soil pH. Thinner sections for each bar indicate when a particular nutrient may become deficient at a certain pH value.

Note that the bar for iron shrinks as pH values climb. In Wyoming's

typically alkaline soils, iron tends to be a common deficiency. Often iron is present in the soil, but not accessible to plants due to high pH.

How do you determine if you might have nutrient issues related to the pH of your soil? You guessed it: a soil test.

Where have all the nutrients gone?

A variety of factors can cause very low levels of soil nutrients. Some nutrients, including nitrogen, can actually be leached (moved out of the soil by water) from soils in certain situations.

Nutrients may also become deficient when growing plants take them up and the nutrients are not replaced. In a vegetable garden, crops like corn or squash use a lot of nutrients when actively growing. Planting these crops in the same location in the garden year after year can quickly deplete the soil of key nutrients.

Regardless of how the deficiency occurred, understanding how to add nutrients back to the soil is key. Nutrients are most often added back to the soil through the incorporation of fertilizers, compost, nitrogen-fixing plants, and/or other forms of organic material. A lab soils test offers



ringlow stock/adobe.com



Figure 1. Strawberry plants showing the symptoms of iron deficiency (a common deficiency in higher pH soils). The veins of the plant are dark green while the tissue between is yellow and in extreme locations is starting to turn white.

Symptoms may include leaves that are miscolored, fruit that is miscolored or misshapen, or incorrect plant growth.

Charts and keys based on leaf color have been developed to help identify potential nutrient deficiencies. Portions of the leaf may turn different colors such as yellow, white, purple, or brown depending on the nutrient that is missing. Working through a chart or key based on the symptoms present offers clues about what might be lacking. Cross referencing the information from the key and the known pH of your garden soil can help isolate the nutrient that is deficient.

Note that such charts are a rough guide. A soil test that examines the levels of all macro and micronutrients is the best method for determining nutrient deficiencies. A soil test can catch potential deficiencies when plants do not show any symptoms.

Check out the following guides to learn about potential nutrient deficiencies based on plant symptoms.

1) Guide to Symptoms of Plant Nutrient Deficiencies, University of Arizona Extension: <https://bit.ly/az-plant-nutrients>

2) Plant Nutrient Functions and Deficiency and Toxicity Symptoms, Montana State University Extension: <https://bit.ly/msu-plant-nutrients>

Final thoughts

Soil nutrient issues are common in Wyoming. Correctly identifying which nutrients are lacking increases the chances of greater production and overall health

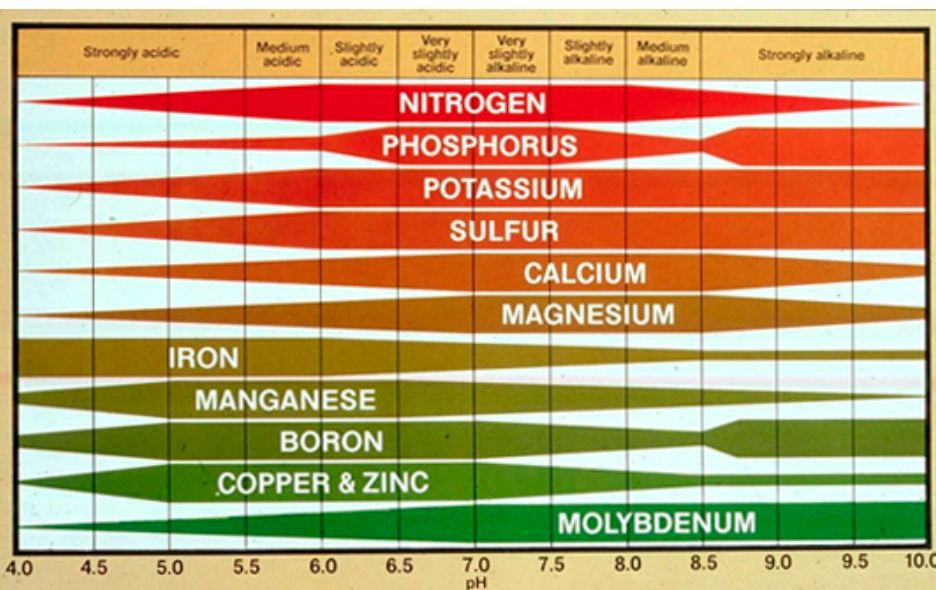


Figure 2. Soil pH affects nutrient availability, potentially resulting in deficiencies.

accurate recommendations for what and how much to add to your soil to correct a deficiency.

The following fact sheets can help you interpret soil test results and provide recommendations for soil amendments.

1) Soil Test Explanation, Colorado State University Extension: <https://bit.ly/csu-soil-test>

2) Choosing a Soil Amendment, Colorado State University

Extension: <https://bit.ly/csu-soil-amendment>

3) Soil Test Interpretation Guide, Oregon State University: <https://bit.ly/osu-soil-test>

Keeping an eye on leaves

Observing plant health can also help pinpoint potential nutrient deficiency issues. Plants that are lacking certain nutrients often exhibit characteristics that aren't present in healthy plants.

of your garden and landscape. Keep in mind that more than one nutrient may be deficient at one time and that plants may need to use one nutrient to help process another nutrient when growing.

Maintaining proper plant health is critical. It can be difficult to diagnose a nutrient issue if a plant is not being properly watered, has disease issues, is suffering from insects, or is experiencing a combination of all three. Knowing what the plants in your garden should look like when healthy is an important first step when diagnosing plant issues.

.....
If nutrient deficient plants could speak, they'd request UW Extension educator **Brian Sebade** as their health and wellness coach. He can be contacted at (307) 721-2571 or bsebade@uwyo.edu.

SOIL TESTING

A routine soil test from a certified lab provides information regarding pH, percent organic matter, and the presence of common macronutrients. Most labs will provide you with recommendations based on your test results. A more specific test is needed for micronutrients.

Some garden centers offer soil testing kits, but they only test the pH and

macronutrients. Knowing the pH of your soil is a good starting point, but may not be enough information to make informed management decisions.

Contact your local UW Extension Office for assistance with soil testing and suggestions for nearby soil testing labs. Visit <https://bit.ly/uwe-soil-sample> for instructions on how to take a sample.

