

# NOBLE NEWS & VIEWS



## SOIL TEST

# How to Interpret a Soil Test Report



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**A**gricultural soil testing can be used for many purposes, but the primary use is to

determine whether or not lime and/or fertilizer is needed, and, if so, how much.

The first step in soil testing is to collect the sample, but, for this article, let's assume you have collected your soil sample, sent it to the lab and received your results. The information on the report may seem pretty confusing, leaving you to ask how to make sense of the data and use it to help you in your operation.

### INFORMATION ON A SOIL TEST

Not all labs report the same information, but most should report the basics: soil pH, lime recommendation (if needed), and soil test phosphorus and potassium. There may be other information on the report, such as soil test calcium, magnesium, sodium, CEC, nitrate-nitrogen, soluble salts and soil organic matter. These additional analyses can be very useful but are not reported by all labs or are considered optional tests with additional costs.

### SOIL PH

Soil pH It is extremely important since it governs root growth and solubility of many nutrients. The pH range is from 1-14, with a pH of 1 being most acidic and 14 being

most basic. Most plants do best in a pH in the range of 5.5 to 7.5. There are exceptions since some plants prefer a more acidic soil and others do fine in a more basic soil. However, the vast majority of plants prefer a pH of 5.5 to 7.5. Soil pH is measured in distilled water and reflects the active acidity in the soil.

If the pH on your soil test report is less than 5.5, you may get a lime recommendation, depending on your crop. The lime recommendation is the amount of 100% effective calcium carbonate equivalent (ECCE) lime that is required to raise the pH to a level your crop prefers. The lime recommendation is calculated by analyzing the pH of your soil in a buffer solution, and it determines the amount of potential acidity in the soil. Some labs

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report the buffer pH and some do not. In either case, a lime recommendation is indicated on the report if lime is needed. The soil pH determines if you need to apply lime; the buffer pH determines the amount of lime needed.

## PHOSPHORUS AND POTASSIUM

Soil test phosphorus and potassium levels are included on almost all agricultural soil test reports. These values reflect the concentration of these elements that is extracted by a chemical solution, called an extractant. The primary soil test extractant used in the United States is called Mehlich 3, but not all labs use Mehlich 3. If labs use different extractants, the soil test values between them cannot be compared.



### TESTING

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The soil test values for phosphorus and potassium have no meaning unless research has been conducted to correlate these values with crop growth and yield. Fortunately, adequate correlation research exists for commonly used soil test extractants, and fertilizer recommendations can be made with confidence from tests using these extractants.

One thing to consider is that labs may not report soil test values in a similar fashion. Some labs report concentration of an element. The primary reporting value is

parts per million (ppm). Other labs report a weight, usually pounds per acre (lbs/a). An acre of soil 6 inches deep weighs about 2 million pounds. Thus, the conversion is  $\text{ppm} \times 2 = \text{lbs/a}$ , or  $\text{lbs/a}/2 = \text{ppm}$ . The only problem with having two reporting systems is that it can cause confusion if you send samples to two labs. It would be possible in this case for one lab to report twice as much nutrient as the other lab, and for both labs to recommend the same amount of fertilizer.

### BEST PRACTICES

Soil testing is the best way to determine how much lime and/or fertilizer is needed on your operation. For best results, collect samples properly, sample at least every three to five years, and collect samples at about the same time of year. 🐄