



How to Read the Spectrum Analytic Soil Test F

[interpretation, reading, report, soil test, understanding](#)

Standard Agricultural Report

This report lists up to 20 results on a single page with no graph. The analytical results are reported in pounds per acre (lbs/acre) for the major nutrients while sulfur (S) and the secondary nutrients are expressed in parts per million (ppm). This report includes a status assignment for each of the nutrients (Low, Medium, Good, High, Very High). This status assignment is unique for various soil conditions and the crop to be grown. The recommendations are listed on a separate page with up to three crops and are made in pounds per acre.

Special Agricultural Report

This report lists one sample result per page, but it includes a large bar graph representing the quality of the nutrients (Low, Medium, Good, High, Very High). This status assignment is unique for various soil conditions and the crop to be grown. The analytical results for the major and secondary nutrients are reported in pounds per acre (lbs/ac), while sulfur, boron, iron, copper, manganese and zinc are only reported in parts per million. This report also includes the optimal or desired range for each test result. The recommendations for this report include up to three crops and are made in pounds per acre.

Turf and Ornamental Report

This report lists one sample result per page, but it includes a large bar graph representing the quality of the nutrients (Low, Medium, Good, High, Very High). This status assignment is unique for various soil conditions and the turf or ornamental to be grown. The analytical results for the all nutrients are reported in parts per million (ppm). This report also includes the optimal or desired range for each test result. The recommendations for this report are made in pounds per 1000 square feet.

Each of these reports is divided into a few major groupings of information. The first or top sections include information that identifies the sample(s). This information includes

- The name and address of the grower or homeowner
- The name and address of the person/company that sent the sample
- The sample identification assigned by the sender and the lab number of the sample assigned by Spectrum Analytic.
- The dates that the sample was received and analyzed by Spectrum Analytic.

The large central section of each report contains the analytical results. As mentioned previously, this section is different for each report.

The last section of each report includes recommendations for fertilizer and other materials as requested by the customer. Please note that **to receive recommendations you must request them on the soil test sheet which is located in the boxes at the bottom of the sheet.** Many customers prefer to m

recommendations or obtain them in other ways. **If recommendations made by Spectrum Analytic the Sample Information Forms sent with the sample must include the appropriate informed intended crop or plant to be grown and yield goals.**

CEC

CEC stands for Cation (pronounced "cat-ion") Exchange Capacity. Cations are elements with a positive charge as K^+ , Ca^{++} , Mg^{++} , Cu^{++} , Fe^{++} , Mn^{++} , Zn^{++} , Al^{+++} , Na^+ , NH_4^+ , H^+ , and others. CEC is an indicator of a soil's ability to attract, hold, and supply cations to plants. Large CEC values indicate that a soil has a greater strength to hold cations. Therefore, it will be more resistant to a change in the soil test, or pH level. If the test level is good, it offers a large nutrient reserve. A high CEC soil also requires a higher soil cation level for adequate crop nutrition. Low CEC soils hold less nutrients, and will likely be subject to leaching of nutrients such as nitrate nitrogen (NO^3-N), sulfur (S), boron (B) and molybdenum (Mo). These soils may benefit from applications of several nutrients. The particular CEC of a soil is neither good nor bad, but knowing it is a useful management tool. See the article "[Cation Exchange Capacity](#)" for more information on CEC.

pH

pH is an indication of the relative acidity or alkalinity of the soil. It is based on a logarithmic scale from 0 to 14, with 7 being neutral. Being a logarithmic scale each change of 1.0 unit is a 10x unit change. For example a pH of 6.0 is 10 times more acid than a pH of 7.0. A soil pH of 5.0 is 100 times (10×10) as acid as a pH of 7.0. Most plants perform best and a wider range of nutrients are adequately available with a soil pH between 6.0 and 7.0. Some plants require more acid soils. Few, if any do better with soil pH higher than 7.0. See the article "[Buffer pH](#)" for more information.

Buffer pH

This is a test that is conducted to determine the amount of lime to apply in order to reach the desired pH. The result does not represent the intended or target pH for that crop or plant. This test is required due to the effect of soil CEC. See the article "[Soil and Buffer pH](#)" for more information.

Nutrients

All nutrients are reported with a status assignment (**Low**, **Medium**, **Good**, **High**, and **Very High**). The standard report has the first letter of each status printed with the result, while the other reports use the full status to indicate the status.

Phosphorous (P)

Reported in pounds per acre or parts per million (ppm $\times 2 = lb./A$), depending on the report. These values may be unique for specific crops or plants.

Potassium (K), Magnesium (Mg), Calcium (Ca)

These are the three major cation elements and are reported in the same format. The amount of each element in the sample is reported in either pounds per acre or parts per million (ppm), depending on the report. Status ranges may be unique for specific crops or plants. Additional information is reported as the percent of each element. Percent saturation is best described as the percent of the CEC that is occupied by the element. The desirability of a particular [percent saturation](#) for each of these nutrients is sometimes affected

conditions and the plant species to be grown. For more information on [calcium](#) and [magnesium](#) individual element. Normally as long as the soil pH is within the optimum range, most plants will receive an adequate amount of calcium. However in the case of acid loving plants such as blueberries, some conifers, etc. the calcium recommendation listed in the comments section of the report.

Sulfur (S), Boron (B), Zinc (Zn), Manganese (Mn), (Cu), and Iron (Fe)

Each element is reported in parts per million (ppm). The reported Cu and Mn recommendations are proprietary formula that calculates the effects other soil factors on the availability of Cu and Mn. For more information on [sulfur](#), [boron](#), [zinc](#), [manganese](#), [copper](#) and [iron](#) click on the individual element.

P₂ Phosphorous

This is the Bray P₂ phosphorus test. It is a test developed many years ago to monitor the effectiveness of applications of rock phosphate fertilizer, which is very slowly soluble. It is sometimes used as an indicator of the "reserve" phosphorus supplying power of the soil. This is a controversial practice and Spectrum Analytic does not use this value in evaluating soils or making recommendations.

Sodium (Na)

Sodium is reported both as parts per million (Na ppm) and percent saturation (Na Sat %). Sodium is typically a major component of the soluble salts value (see the following section on soluble salts) and high levels of Na are detrimental to both plant growth and soil structure, and many of the guidelines are based on percent saturation of Na.

Soluble Salts (Salts)

Soluble salts are reported as a measurement of electrical conductance of the soil solution in millimhos/centimeter (mmhos/cm). This value increases as the salt content of the soil increases. High levels of soluble salts are generally damaging to plant growth. However, plant tolerance of soluble salts is highly variable between species.

Nitrate-N (NO³-N)

Nitrate-N is the predominant form of N used by most plants. It is also the form most easily lost through leaching under environmental and soil conditions. The level of nitrate reported is NOT used in the nitrogen recommendation because of the many variables that can affect ultimate plant availability.

Texture

Soil texture refers to the percent sand, silt, and clay contained in the soil. The proportions of these three components determine the name assigned to the soil (sandy loam, silty clay, etc.) as shown in the USDA texture classification chart. The name of the texture is reported in one column, with the percentages of sand, silt, and clay in the other two columns. This information has several applications, but is probably used most frequently to identify soil characteristics of the soil.

Recommendations

Nutrient recommendations are made in pounds per acre or pounds per 1000 square feet of the element listed. Lime is recommended in pounds per acre of 100% calcium carbonate equivalent (CCE) for agricultural crops and reports have an assumed sampling depth of 7 inches; while turf samples and reports have an assumed sampling depth of 4 inches. Corrections should be made for actual **purity of lime, fineness and depth of sample**. The philosophy behind fertilizer recommendations at Spectrum Analytic is to: 1) provide enough nutrients to produce the listed yield goal, and 2) when the soil test level of a nutrient is less than (Good), recommend additional nutrients to correct the soil test over a 3 to 5 year period. All recommendations are assumed to be as a broadcast application, unless otherwise noted. Rates should be adjusted for the application method used, and the actual land area that is fertilized.

Comments

This section will contain appropriate comments related to crops or plants and results indicated in the report. You can also find recommendations for calcium in this area as needed.

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