Explanation of a Soil Analysis Report

FACT SHEET

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OFFICE INFORMATION

(A) **Report Number** All samples are filed by their report number. Be sure to refer to this number when contacting A & L Great Lakes Laboratories about a report.

(B) **Sample Number** Your soil sample I.D. Limit this number to no more than six digits and/or letters.

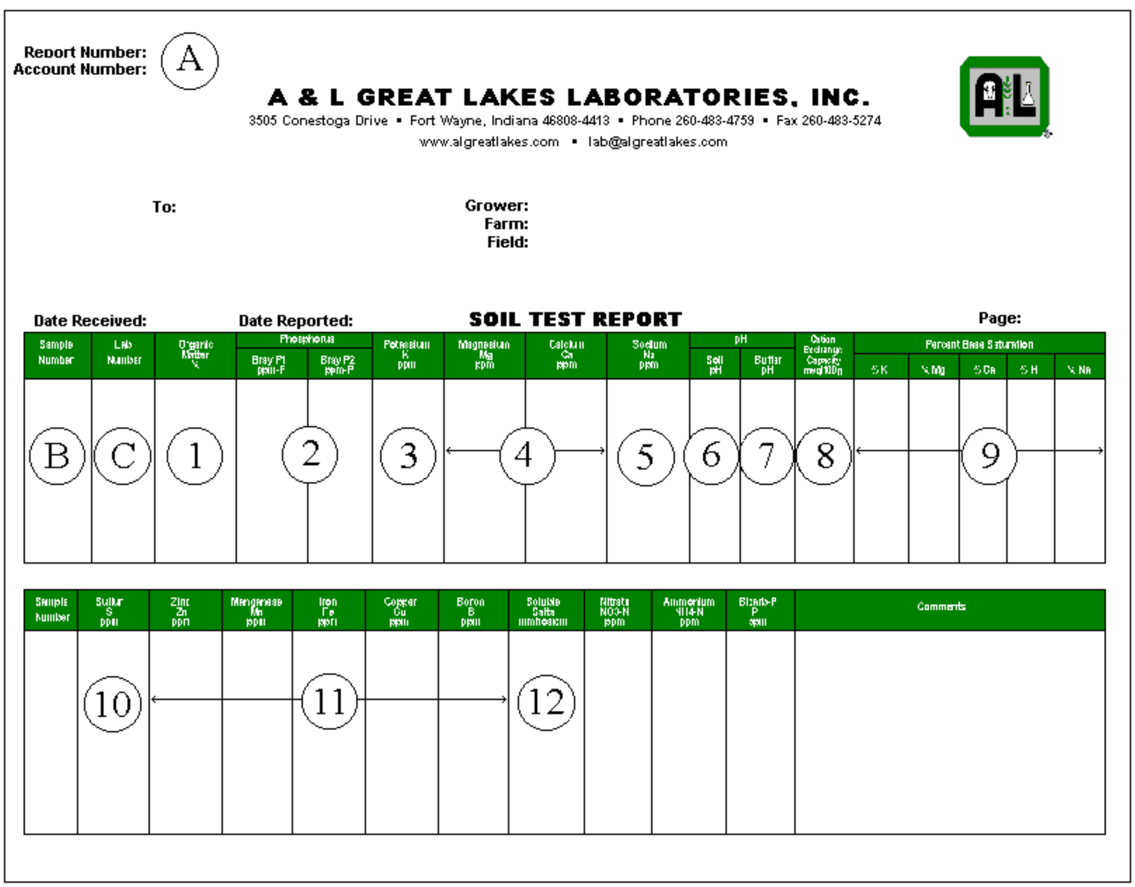
(C) **Laboratory Number** This number is assigned by A & L to each individual sample for tracking.

REPORT TERMS

ppm (parts per million) Results for major and minor elements are reported in ppm on an elemental basis. This unit of measurement is equivalent to pounds of nutrient per million pounds of soil. One acre of mineral soil 6 to 7 inches deep weighs about two million pounds. Therefore, to convert parts per million readings to pounds per acre, multiply by two.

meq/100g (milliequivalents per 100 grams) Soil cations including calcium, magnesium, potassium and hydrogen can be expressed in terms of their relative ability to displace other cations. The unit of measure is meq/100g. Example: One milliequivalent of potassium is able to displace exactly one milliequivalent of magnesium. The cation exchange capacity of a soil and the total amounts of individual cations are expressed in this way.

mmhos/cm (millimhos per centimeter) Electrical conductivity is used to measure the amount of soluble salts in a soil and is expressed in mmhos/cm. The conductivity of a soil increases with an increase in soluble salts. A soil is considered saline when the conductivity reading of the saturated extract reaches 2 mmhos/cm.



1 **Organic Matter** Organic matter is expressed in percent. It measures the amount of decomposed plant and animal residues in a soil. Soil color is closely related to the amount of organic matter. A darker color is usually associated with high organic matter. Dark-colored soils often test above 3.5% organic matter.

2 **P1 (Weak Bray) Phosphorus** This test measures phosphorus that is readily available to plants. The optimum level will vary with crop, yield and soil conditions. Twenty to thirty ppm is adequate for most field crops. Certain specialty crops may need higher levels.

P2 (Strong Bray) Phosphorus This test measures phosphorus that is readily available and part of the active reserve phosphorus in a soil. Forty to sixty ppm is a desirable level for most crops.

Sodium Bicarbonate Phosphorus This method determines the amount of readily available phosphorus in calcareous soils. A level of 15 ppm or more is desired to produce good yields for most crops.

3 **Potassium** This test is a measure of available potassium in a soil. The optimum level will vary with the crop, yield and soil type. A potassium level of 120 to 170 ppm is adequate for most field crops. Higher levels are generally needed on soils high in clay and/or organic matter, versus soils that are sandy and low in organic matter.

4 **Magnesium and Calcium** Calcium deficiencies are rare when the soil pH is adequate. Magnesium deficiencies are more common. The levels of calcium and magnesium found in a soil are primarily affected by soil type, drainage, liming and cropping practices. These basic cations are closely related to soil pH. Magnesium levels exceeding 50 ppm are adequate for most crops.

5 **Sodium** Although sodium is an essential nutrient for some crops, its effect on the physical condition of a soil is of greater importance. High sodium in soils may cause adverse physical and chemical conditions. Excessive levels of sodium can be reduced by leaching and/or by the application of calcium sulfate (gypsum).

6 **Soil pH** This test measures active acidity or alkalinity. A pH of 7.0 is neutral. Values higher are alkaline while values lower are acid. A pH of 6.0 to 7.0 is the desired range for most crops grown in mineral soils. Organic soils require a lower pH range of 5.0 to 5.5.

7 **Buffer pH** This reading indicates a soil's potential acidity. A lower buffer pH represents a larger amount of potential acidity and thus more lime is needed to increase the soil pH to a given level.

Lime Requirement to Increase Soil pH (Tons/Acre)

Mineral Soils (CEC > 7.0)			Organic Soils (OM > 10%)		Sandy Soils (CEC <= 7.0)		
Buffer pH	Lime to pH 6.9	Lime to pH 6.5	Soil pH	Lime to pH 5.3	Soil pH	Lime to pH 6.9	Lime to pH 6.5
6.8	1.5	1.0	5.2	0.0	6.3 - 6.6	1.0	0
6.7	2.5	2.0	5.1	0.7	6.0 - 6.2	1.5	1.0
6.6	3.5	3.0	5.0	1.3	5.7 - 5.9	2.0	1.5
6.5	4.5	4.0	4.9	2.0	5.4 - 5.6	2.5	2.0
6.4	5.5	4.5	4.8	2.6	5.1 - 5.3	3.0	2.5
6.3	6.5	5.5	4.7	3.2	<5.1	3.5	3.0
6.2	7.5	6.5	4.6	3.9			
6.1	8.5	7.0	4.5	4.5			
6.0	9.5	8.0	4.4	5.1			

8 **CEC (Cation Exchange Capacity)** CEC measures the soil's ability to hold nutrients such as calcium, magnesium and potassium, as well as other positively charged ions (sodium and hydrogen). The CEC of a soil will vary with the kind and amount of clay and percent of organic matter.

9 **Percent Base Saturation** This is the proportion of the CEC occupied by a given cation or a combination of cations, referred to as bases. The percent saturation for each of these cations will usually be within the following percentage ranges: Calcium 40-80, Magnesium 10-40, Potassium 1-5.

10 **Sulfur** This test is a measure of sulfate-sulfur. It is a readily available form preferred by plants. Optimum levels usually range from 15 to 20 ppm.

11 **Micronutrients** The available levels of micronutrients found in samples are rated from very low to very high. However, applying the recommended amount of certain micronutrients with a "low" rating will not necessarily insure a crop response because of other factors which can influence that response. Some of those factors include soil pH, soil type, physical properties, moisture and crop variety.

12 **Soluble Salts** Excessive concentrations of various salts can develop in soils. This may be natural or the result of irrigation, excessive fertilization, or contamination from chemicals or industrial waste.

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