

# Understanding Your Soil Test Report

## Soil pH

A measure of the active acidity or alkalinity in a soil/water slurry. pH 7.0 is neutral , pH < 7.0 is acidic and pH > 7.0 is alkaline. Most turf and ornamentals prefer a pH in the range of 6.0 to 7.5. Certain alkaline soil intolerant (acid-loving) ornamentals prefer a soil pH < 6.0.

## Buffer pH

A measure of an acid soil's ability to lower the pH (acidify) a buffered solution. This test is used to determine the soil's resistance to change in pH or its reserve acidity, when the soil pH is below 7.0. The Buffer pH and not the soil pH is used to determine the lime requirement in most soils.

## Phosphorus (P)

A measure of the plant available phosphorus (Mehlich 3) expressed in pounds per acre. The relative level of phosphorus needed for plant growth is shown by the bar graph.

## Potassium (K)

A measure of the plant available potassium (Mehlich 3) expressed in pounds per acre. The relative level of potassium needed for plant growth is shown by the bar graph.

## Calcium (Ca) and Magnesium (Mg)

A measure of the plant available (Mehlich 3) calcium and magnesium expressed in pounds per acre. Optimum soil test levels may vary depending on the cation exchange capacity (CEC) and percent base saturation.

## Cation Exchange Capacity (CEC)

A calculated value used to determine the relative nutrient holding capacity (apparent CEC) of the soil for the cations K<sup>+</sup>, CA<sup>++</sup>, Mg<sup>++</sup>, H<sup>+</sup> (hydrogen) and Na<sup>+</sup> (sodium), if the sodium test is requested. CEC values are expressed in milliequivalents per 100 grams (meq/100 gm). \* Certain types of clay soils have a low CEC ranging from 3 to 12

<u>Typical CEC Ranges</u>	<u>Soil Texture</u>	<u>Relative Nutrient Holding Capacity (CEC)</u>
0 - 12	Coarse (sandy)	Very Low < 5
8 - 25	Medium (loamy)	Low < 10
22 - 35+	Fine (clayey)*	Medium 10 - 22
> 35	Organic	High > 22

## Percent Base Saturation

Calculated values showing the percentage of the CEC occupied by each of the tested cations. Most turfgrasses and ornamentals perform best when the cations are in the ranges shown below

<u>Element</u>	<u>Symbol</u>	<u>Optimal Range</u>
Potassium	K	2 - 7%
Calcium	Ca	65 - 85%
Magnesium	Mg	10 - 20%
Hydrogen	H	0 - 5%* (when present)
Sodium	Na	0 - 5% (when tested)

\* Higher hydrogen saturations ( 5 - 25%) may be acceptable for certain acid-loving plants. Calculated base saturations will be lower than normal and the CEC will be higher than normal when the hydrogen saturation exceeds 10%.

### **Micro & Secondary Nutrients**

Plant available micro and secondary nutrients (Mehlich 3) can be interpreted by the bar graphs or according to the table below. Response to plant available micro and secondary nutrients may differ according to the turf or ornamental plant type.

Relative Value:	Iron -Fe	Manganese- Mn	Zinc - Zn	Copper - Cu	Boron - B	Sulfur - S
			(lbs / acre)			
Low	< 125	< 50	< 3.7	< 1.0	< 0.5	< 20
Adequate	125 - 375	50 - 110	3.7 - 8.2	1.0 - 5.8	0.5 - 3.0	20 - 80
High	> 375	> 110	> 8.2	> 5.8	> 3.0	> 80

### **Organic Matter (O.M.)**

An estimate of the organic matter content of the soil reported as percent by weight. Organic matter is determined by loss on ignition (LOI) according to ASTM F1647-18.

### **Soluble Salts**

A measure of the salt concentration in the soil from both fertilizers and non-fertilizer sources express in mmohs/cm.

Potential for Plant Injury	Soluble Salts mmohs/cm
Very Low	< 0.25
Low	0.25 - 1.00
Medium (Sensitive plants may be injured)	1.01 - 2.00
High	2.01 - 3.00
Very High	> 3.00

### **Display of Average Results**

This section of the report shows the relative value of the test result in a bar graph form. When multiple samples are reported on lines 1 thru 10, line 11 is the calculated average of the test values listed in each column and this is the value represented by the bar graph. This provides an easy to interpret guide to the nutrient status of the soil or the suitability of the soil for optimum plant performance.

## Notes

Optimum levels of plant nutrients vary with plant type, its use (area type) and fertility management level. These factors, along with soil test results, are used to make specific nutrient recommendations.

To convert pounds of nutrient per acre to parts per million (ppm) divide the reported value by 2.

### Understanding The Lime And Nutrient Recommendations

To avoid plant injury consult with a professional in the turf and ornamentals industry or your local county cooperative extension service before using recommended fertilizers or lime.

All Recommendations represent a typical amount for the plant type, its use (area type) and fertility management level as determined by the sample information provided and the soil test results.

Lime Recommendations are given in pounds per 1,000 sq.ft. (lbs./M) of ground limestone (TNP > 90%). Recommendations are for the amount needed to correct acid soil conditions for the specific plant types. Do not over apply lime to established turf or ornamentals. Split applications may be necessary. Incorporate recommended amount into the root zone prior to establishment. Split applications may be necessary.

Lime Type When calcium and magnesium tests are performed, the lime type recommended will be shown as high calcium/calclitic (Ca) or high magnesium/dolomitic lime (Mg) .

Nitrogen Recommendations are given in pounds per 1,000 sq.ft. (lbs./M) of actual nitrogen (N). APP.FREQ. Recommendations for application frequency given on a per season basis (S) should be split into multiple applications. Recommendation may also be given on a per month (M) of growing season or per month of establishment basis. When the NEW/EST. fertility management level is selected, nitrogen recommendations are for incorporation into the soil at the time of planting (preferred) or for surface applications during the first three months or more of establishment.

Phosphate Recommendations are given in lbs. per 1,000 sq.ft. (lbs./M) of P<sub>2</sub>O<sub>5</sub>. Recommendations are given as the annual amount for maintenance, if the soil test values are adequate to high; the corrective amount, if soil test values are low; or the amount to be used during the establishment phase.

Potassium Recommendations are given in lbs. per 1,000 sq.ft. (lbs./M) of K<sub>2</sub>O. Recommendations are given as the annual amount for maintenance, if the soil test values are adequate to high; the corrective amount, if soil test values are low; or the amount to be used during the establishment phase.