LAWN & GARDEN SOIL RESULTS

AgSource LABORATORIES

Submitted By: 8888888
Joe Smith

Submitted For:
Joe Smith

Laboratory Sample #
CX85393
9741-07

Date Received
6-Sep

Date Reported
11-Sep

Information Sheet #
TEST_20200923

Sample ID Test07 **Recommendation For:** Lawn **SamplesStored Until** 21-Sep

Soil Submission Results

Element	Your Results		Ideal Range	Low	Optimum	High
pH	7.7		6.5 - 7.3			
Nitrate Nitrogen NO_3-N	13.0	ppm	5.8 - 11.6			
Phosphorus (P)	24	ppm	10 - 14			
Potassium (K)	332	ppm	161 - 201			
Organic Matter	2.9	%	2.5 - 4.5			
Soluble Salts	0.5	mmhos/cm	0.1 - 1.2			
Calcium (Ca)	82.1	%	65 - 76			
Magnesium (Mg)	13.4	%	15 - 21			
Cation Exchange Capacity	27.5	meq/100g				

Your Annual Nutrient Needs in Lbs/1000 sq ft

Lime	Nitrogen, N	Phosphorus, P_2O_5	Potassium, K_2O
0	1.5	--	--

Comments:

- Plant food recommendations are for the entire growing season being presently grown.
- Do not apply more than 1 lb/1000 sq ft of nitrogen (N) any one application, if slow release N is used, more N can be applied, but no more than 3 lb/1000 sq ft.
- Apply fertilizer containing the recommended amount of phosphorus (P2O5) and up to 1 lb/1000 sq ft of potassium (K2O) with the Spring application of nitrogen.
- Epsom salt (MgSO4) will increase magnesium level without adjusting the soil pH level. Do not apply more than 5 lb/1000 sq ft, or 200 lb/acre, in a year.
- The target pH for a lawn or garden is 6.5 and this soil is at or above that value. DO NOT APPLY ANY LIME.
- Recommended rates are the total amount of nutrients to apply (N-P2O5-K2O) including starter fertilizer.
- For low maintenance lawns apply 0.5 lb nitrogen (N)/1000 sq ft in April or May and 1 lb N/1000 sq ft in late Fall.
- For higher maintenance lawns apply 0.5 lb nitrogen (N) 1000/sq ft in April or May, 1 lb N/1000 sq ft in September and 1 lb N/1000 sq ft in late Fall
- Nitrogen is in the high range, but due to leaching we still recommend applying 1 lb N/1000 sq ft in the Fall to supply late season needs.

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LAWN AND GARDEN NUTRIENT GUIDE

Your soil acts as a reservoir that stores and releases the nutrients required for healthy and productive plants. By understanding your soil's nutritional baseline, you can maintain optimal soil conditions and the essential nutrients required for green lawns and lush gardens.

Use your SoilWise test results as a nutrient roadmap to determine if the soil has what it needs, or if fertilizer and ammendment applications are needed. This guide will help explain what each nutrient is and why it's needed.

Essential Nutrient	Ideal Range
pH	6.5 - 7.3
Nitrate Nitrogen (N)	5.8 - 11.6 ppm
Phosphorus (P)	16 - 21 ppm
Potassium (K)	161 - 201 ppm
Organic Matter	2.5 - 4.5 %
Soluble Salts	0.1 - 1.2 mmhos/cm
Calcium (Ca)	65 - 76 %
Magnesium (Mg)	15 - 21 %
Cation Exchange Capacity (CEC)	5-25 meq/100g

pH

What it is: Soil pH is the acidity or alkalinity of soil measured in pH units.

Soil pH is classified by three categories: neutral, acid, and alkaline.

pH 7.0; chemically neutral
Less than 7.0 acid
Greater than 7.0 alkaline

Why it matters: A soil's pH affects how available or unavailable soil nutrients are to the plant. If the soil pH is too high or too low, it will bind-up nutrients in the soil in a form that plants can't take up and utilize. Most soils have a pH range between 4.5 to 8.7.

For example, if iron is applied to a high pH (alkaline) soil it will bind-up with the soil calcium before the plant has the ability to absorb it causing anemic, yellow looking plants.

IDEAL RANGE:
6.5 TO 7.3 – slightly acid.

Remediation plan: If soil pH is outside the ideal range, a soil amendment should be applied and incorporated into the soil (rototilling is the best).

If acid < 6.2 (strongly acid is below 5.5)
Limestone applications are needed to raise soil pH

If alkaline 7.5 to 8.5
Elemental sulfur applications are needed to lower soil pH

If strongly alkaline 8.2 to 8.8 (or higher)
Elemental sulfur and gypsum are needed to lower pH and add soil calcium

The soil report will indicate the type of soil amendment to apply and the rate that will provide the effective pH adjustment. These amendments are typically found at your local garden center.

Nitrate Nitrogen (N)

What it is: A major component in promoting optimal plant growth. Nitrogen is utilized in the greatest quantities for vegetative growth.

Why it's important: Nitrogen makes up part of the chlorophyll in plants (why they are green!) and provides the plants with the energy they need to grow.

IDEAL RANGE:
5.8 - 11.6 parts per million (PPM)

Remediation plan: If your nitrogen value in the soil is too high, it is not a good thing! Not only will it have a negative effect on your plants, but it can also get into storm drains and water supplies, causing adverse effects.

Too low of a nitrogen value means a fertilizer must be applied to give your plants the energy they need to sustain growth. If your soil is deficient, your results will tell you the proper application rate.

Phosphorus (P)

What it is: An essential plant nutrient related to energy use and root development.

Why it's important: It is necessary for cell division required for growth and proper development. In vegetable crops, it's necessary for seed and fruit development.

IDEAL RANGE:
16 to 21 parts per million (PPM) *If higher than 25 ppm no additional phosphorus should be applied

Remediation plan: Phosphorus is not soluble in water, so it stays on the soil surface where it is applied. Understanding how much phosphorus your soil has is important – over time, it can build up at the top of the surface, washing away with eroded soil to potentially cause pollution. (Check with your state government, in some states phosphorus fertilizer can not be applied without a professional soil test.)

Always consult your soil test results before applying nutrients to avoid over fertilization which can lead to negative effects on plant growth, the environment and local water resources.

Potassium (K)

What it is: Required for the development of a healthy root system and is utilized in photosynthesis. Like nitrogen, potassium is used in large quantities by the plant.

Why it's important: Provides the plant the ability to withstand stress by controlling the flow of water through plants as they transpire and is associated with disease resistance and winter hardiness.

IDEAL RANGE:
161 to 201 pars per million (PPM)

Soils with sandy texture and low organic matter tend to have low potassium levels because the element is not absorbed on the soil surfaces.

Remediation plan: Unlike nitrogen and phosphorus, high levels of potassium is not an environmental concern, however, there is no added benefit to higher levels. High rates of potassium in a fertilizer application can damage established turf by causing a salt burn. Applied rates should be no more than one pound per 1,000 sq. ft. in any one fertilizer application.

Organic Matter

What it is: Organic matter refers to the portion of the soil consisting of decomposed plant, microbial, and animal residues.

Why it matters: Organic matter content, expressed as a percent on your results, acts as a storehouse for plant nutrients, improves the physical structure of soil and has a very high capacity for holding soil water.

IDEAL RANGE:
2.5 TO 4.5%

Sandy soil or some urban soils that have been highly disturbed may have very little organic matter (0.5% to 2%)

Remediation plan: If organic matter is low (below 2.5%), organic amendments can be applied and mixed into the soil surface. Peat moss or organic residue (lawn clippings, leaf litter, straw, etc) are preferred over a composted manure product. Manure is a fertilizer – application rates should not exceed more than two yards per 1,000 sq. ft. in any one application.

Soluble Salts

What it is: As the name implies, it's salt in your soil. The measurement you receive is the concentration of dissolved salts in the soil solution.

Why it matters: When high values of salt are in your soil, plants cannot take up as much water, therefore inhibiting healthy plant growth.

TYPICAL LEVEL:
Soils will have a low value, less than 1.2 mmhos/cm

Remediation plan: If the soluble salt value rises above 2.0 it becomes important to continue monitoring this level over time. If it continues to increase, the growth of turfgrass and sensitive vegetable plants will be negatively affected. Check the salt content of the irrigation water, apply only nutrients recommended from your soil test report, do not apply high rates of composted manure products and check the irrigation water infiltration rates.

Calcium (Ca)

What it is: an essential part of the plant cell wall structure, provides for normal transport and retention of elements as well as strength in the plant.

Why it matters: Calcium also acts as a bonding agent, making it important in the development of good soil structure.

IDEAL RANGE:
65 to 76%

Remediation plan: Most soils that are deficient in calcium have a very sandy texture with low organic matter content (<1.0%). They are typically acidic, or have a low pH, and require lime (calcium carbonate) to raise the pH. Soils with a good pH generally have adequate calcium.

Magnesium (Mg)

What it is: Magnesium is part of the chlorophyll in all green plants and essential for photosynthesis.

Why it matters: Magnesium activates many plant enzymes needed for growth.

IDEAL RANGE:
15 TO 21%

Soils low in magnesium are most often associated with sandy soil textures and low organic matter content (less than 1.0%).

Remediation plan: Magnesium is similar to calcium in that a deficiency is most often associated with soils with low pH. If the soil pH needs to be increased on soils with low magnesium then a Dolomitic limestone (calcium and magnesium carbonate) should be used as the liming material.

Cation Exchange Capacity (CEC)

What it is: CEC is an indirect measurement of the soil clay content, therefore it can be used to estimate soil texture.

Why it matters: CEC reflects the ability of the soil to attract and retain nutrients for plants to use.

IDEAL RANGE:
5 to 25 meq/100g

A higher value indicates the soil has a great capacity to supply nutrients to plants.

Remediation plan: Soils with lower CEC need smaller, more frequent applications of plant nutrients because they have a lower capacity to retain and supply them to growing plants.

Besides the essential nutrients, **soil pH, organic matter, cation exchange capacity and soluble salts** also play an important role in soil fertility. Their levels have a direct result on the soil's ability to store and release nutrients.

Always consult your soil test results before applying nutrients to avoid over fertilization which can lead to negative effects on plant growth, the environment and local water resources.