

TEST PROCEDURES & METHODS

For the best use of soil testing results it is important to know the following information:

1. Laboratory method used for each analysis.
2. Units reported for each analysis.
3. Any conversion or calculation used for specific tests.

AgSource uses recommended methods for determining soil fertility characteristics and the availability of essential nutrients required for plant growth.

Actual nutrient availability in the soil is determined by changing factors including: soil moisture, temperature, pH, clay content, internal drainage, organic content, and physical barriers. As any of these factors change, the availability will also change.

SOIL - All soil samples are dried and ground.

Analysis	Units	Method Description
Soil pH	--	1:1 Soil/Water Slurry
Buffer pH	--	Sikora Buffer Solution
Soluble Salts (EC)	mmhos/cm	1:1 Soil/Water Slurry
Potassium	ppm	Ammonium Acetate Extraction
Phosphorus, Bray 1	ppm	Bray 1 Extraction, If pH < 7.2
Phosphorus, Olsen	ppm	Olsen Extraction, If pH > 7.1
Calcium, Magnesium and Sodium	ppm	Ammonium Acetate Extraction
Sulfur	ppm	Monocalcium Phosphate Extraction
Copper, Iron, Manganese and Zinc	ppm	DTPA Extraction
Boron	ppm	Hot Water Extraction
Nitrate-Nitrogen	ppm	Cadmium Reduction
Ammonium Nitrogen	ppm	KCl Extraction
Organic Matter	%	Loss on Ignition (LOI), expressed as OM%
Chloride	ppm	Calcium Nitrate Extraction
Aluminum	ppm	Cesium Chloride Extraction
Molybdenum	ppm	Ammonium Oxalate
Salinity Evaluation	mmhos/cm	Saturated Paste Extraction
Particle Size Analysis (Sand-Silt-Clay)	%	Hydrometer Measurement
Soil Moisture	%	Loss on Drying
Other Methods Available		Pertains to country of origin

Soil test and greenhouse media methods are described in:

- **Recommended Chemical Soil Test Procedures for the North Central Region**, North Central Research Publication No. 221 (Revised), 2015, Missouri Agricultural Experiment Station SB 1001.
- **Methods of Soil Analysis, Parts I, II, and III**. 1996. Soil Science Society of America.
- **The American Society for Testing and Materials (ASTM) Standard Tests Methods**, 1988.
- **Analytic procedures used in US EPA Report SW-846, Test Methods for Evaluating Soil Waste**, November 1990, as revised, 3rd Edition.
- **Association of Official Analytical Chemists (AOAC) Official Methods of Analysis**, 1990, 15th Edition.
- **Standard Methods for the Examination of Water and Wastewater**, 1992. 18th Edition.

PLANT TISSUE - All plant tissue samples are dried and ground.

Analysis	Units	Method Description
Total Nitrogen	%	Total Kjeldahl Digestion
Minerals:		
P, K, S, Ca, Mg, Na	%	Nitric Acid/Hydrogen Peroxide Digestion
Cu, Fe, Mn, Zn, B, Al	ppm	Nitric Acid/Hydrogen Peroxide Digestion
Nitrate-Nitrogen	ppm	2% Acetic Acid Extraction
Phosphate-Phosphorus	ppm	2% Acetic Acid Extraction
Extractable Potassium	%	2% Acetic Acid Extraction

Plant tissue test methods are described in:

- **Plant Analysis Handbook**. 2014, 4th Edition, Micro-Macro Publishing, Inc. Athens, GA.

GREENHOUSE MEDIA - All samples are saturated before analysis.

Analysis	Units	Method Description
Media pH	--	Saturated Media Extract (SMS)
Electrical Conductivity	mmhos/cm	Saturated Media Extract (SMS)
Phosphorus, Potassium, Calcium, Magnesium, Sodium, Zinc, Copper, Iron, Manganese, Boron, Aluminum, Nitrate-N, Ammonium-N	ppm	Saturated Media Extract (SMS)
Extractable Copper, Iron, Manganese and Zinc	ppm	DTPA Extraction
Organic Matter & Organic Carbon	%	Loss on Ignition
Total Nitrogen	%	Total Kjeldahl Digestion
Soluble P ₂ O ₅	%	Citric Acid Extraction
Soluble K ₂ O	%	Ammonium Oxalate Extraction