

Soil Test	Extractant	Conditions	Analysis	Reference
<i>Routine Soil Test</i>				
Phosphorus, Potassium, Calcium, Magnesium, Sodium, Sulfur, Copper, Zinc	Mehlich 3	2 g soil / 20 mL solution, 5 min. shaking. (3.75 M NH ₄ F – 0.25 M EDTA NH ₄ NO ₃ , CH ₃ COOH, and HNO ₃)	ICP	Mehlich, 1984
pH	Water	10 g soil / 10 mL deionized H ₂ O 2 hr. equilibration	pH meter + electrode	McLean, 1982
Lime requirement	Titration with Ca(OH) ₂ equivalent to lime rates of 1, 2, and 3 T/A	10 g soil / 25 mL deionized H ₂ O + 2.5 mL sat. Ca(OH) ₂ solution for each T/A lime, 15 min shaking every 3 hr. for 16 hr.	pH meter + electrode	McLean, 1982
Sulfur requirement	Titration with H ₂ SO ₄ equivalent to lime rates of 1, 2, and 3 1000 lbs./A	10 g soil / 25 mL deionized H ₂ O + 3.125 mL 0.1N H ₂ SO ₄ for each 1000 lbs./A lime, 15 min shaking every 3 hr. for 16 hr.	pH meter + electrode	
Texture	Determined by hand			
<i>Optional Soil Test</i>				
Organic Matter	Acid-dichromate oxidation	1 g soil / 10 mL 1 N K ₂ Cr ₂ O ₇ + 20 mL conc. H ₂ SO ₄ (wait 2 hours) + 90 mL H ₂ O, 16 hr. equilibration	Dip-Probe colorimeter	Nelson and Sommer, 1982
Soluble salts	Water	20 g soil / 40 mL deionized H ₂ O 30 min shaking, 16 hr. equilibration	Conductivity	Rhoades, 1982
<u>Flood</u> (Soluble salts, Chloride, Magnesium, Sodium, Sulfur, SAR)	Water	20 g soil / 40 mL deionized H ₂ O 30 min shaking, 16 hr. equilibration <i>Filter 20 g/ 40 mL solution</i>	Conductivity <i>ICP</i>	Rhoades, 1982
Boron	Hot water	10 g soil / 20 mL deionized H ₂ O 15 min reflux @ 100° C	ICP	Bingham, 1982
Manganese, Iron, Copper, Zinc	DTPA	10 g soil / 20 mL pH 7.3, 0.005 M DTPA, 2 hr. shaking	ICP	Baker and Amacher, 1982
Aluminum	BaCl ₂ / NH ₄ Cl	2 g soil / 20 mL 0.1 M BaCl ₂ / NH ₄ Cl, 15 min shaking	ICP	Barnhisel and Bertsch, 1982
Nitrogen		0.25 g soil	LECO CN Analyzer	Dumas Dry-Combustion
Carbon		0.25 g soil	LECO CN Analyzer	Dumas Dry-Combustion

Plant Test	Reagents	Conditions	Analysis	Reference
<i>Plant Tissue</i>				
Phosphorus, Potassium, Calcium Magnesium, Sulfur, Boron, Cooper, Iron, Zinc, Molybdenum, Aluminum, Sodium, Lead, Cadmium, Arsenic, Nickel, Chromium, Cobalt, Selenium	Water/HNO ₃ /H ₂ O ₂	0.5 g tissue - add 2.2 ml of DI Water, heat block to 125°C, add 5 mL concentrated HNO ₃ digest for 2.75 hr. on heat block, then add 3 mL H ₂ O ₂ , cool, and filled to a volume of 20 mL with DI Water (5g/20mL)	ICP	Benton, 1991 Jones Jr, 2001
Nitrogen		0.15 g soil	LECO CN Analyzer	Dumas Dry-Combustion
Carbon		0.15 g soil	LECO CN Analyzer	Dumas Dry-Combustion

Water Test	Volume	Procedure
<i>Water Test</i>		
pH	25 mL	Direct read on pH meter.
Alkalinity	25 mL	Titrate to pH 4.5 using 0.02 N HCl and calculate.
Conductivity	25 mL	Direct read on conductivity meter
Sodium, Calcium, Magnesium, Potassium, Iron, Manganese, Sulfur, Chloride	15 ml	Direct read on ICP.
Nitrate	1 mL	Direct read on Hach DR900 Colorimeter.