

Soil Testing Products



 LaMotte

In February of 1928, LaMotte chemist W.R. Kenny developed a "Duplex" pH indicator for the specific purpose of measuring soil pH over a wide range. Later that same year, a kit was developed incorporating the Morgan soil pH test methods. Introduced into the LaMotte line of products, these became the first commercially available soil pH test kits. It was on this foundation that we pioneered the portable soil test equipment industry.

As early as 1932, LaMotte began to manufacture combination soil analysis outfits for pH and macronutrients. Modern agriculture has incorporated soil testing as an essential tool for designing profitable crop management and for long-term land use programs. Our line of soil test equipment has expanded from simple spot-plate pH kits to encompass laboratory instrumentation outfits packaged in portable carrying cases.

Ongoing research in LaMotte laboratories has led to the development of improved test methods. A transition from many of the standard spot-plate analysis methods to color comparisons with clear, filtered extracts has provided a more precise method for color matching. Improved reagent systems with greater stability and sensitivity represent our most productive contribution to modern soil analysis equipment.

Our commitment to quality and service has never changed here at LaMotte. We still feel that test equipment, on every level of analysis, should be designed to measure the elements precisely, while also being rugged enough to stand up to harsh field conditions.



SHIPPING CODES & WEIGHTS

Shipping codes and weights for shipping are included in this catalog for your convenience. The shipping code will refer to one of the following in this chart. Weight will be in pounds and enclosed in ().

NH Non Hazardous No Fees
HF Hazardous Materials Air & Ground Fees
R1 Small Quantity Hazardous Materials No Fees
R2&R3 Hazardous Materials Air Fees Only

Table Of Contents:

pH Meters	3
Dissolved Salts Meters & pH Accessories	4
Electronic Lab	5
Agricultural Outfits	6
Turf, Garden & Education Outfits	8
Individual Test Kits	9
Hydroponics Outfits	10
Sampling Equipment	11
Handbooks & Catalogs	12



Code
5-0034

Soil pH is a measure of the relative acidity or basicity of a given soil. The pH scale (0-14) is a logarithmic expression of hydrogen ion activity. A pH of 7.0 is neutral, and soils above or below this value are either alkaline or acidic, respectively. A soil with a pH of 6.0 is ten times more acidic than a soil of pH 7.0. Changes in soil pH dramatically affect the availability of nutrients to growing crops. The pH meter is the preferred method for determination of soil pH and the only one adaptable to the buffer methods for determining the lime requirement of a soil. pH is measured by mixing a 1:1 ratio of soil and distilled water. Distilled water not included with meters.

pH Meters & Accessories

LaMotte pH 5 Series Meter

pH 5 (without case)
includes pH 4, 7, and 10 buffer tablets
Code 5-0034 • NH (3)

pH 5 (with case)
includes pH 4, 7, and 10 buffer liquids
Code 5-0035 • NH (5)

Meter includes electrode and temperature probe, and is available with or without a carrying case.

FEATURES:

- Push button operation
- Three point calibration
- Range: 0.00-14.00 pH/0.01 pH
- Power: Four AAA batteries included
- Temperature readout 0-100°C/0.1°C
- Automatic Temperature Compensation
- Auto-off after 17 minutes
- Hold function
- Instructions included for measuring pH in soil

Code
1741

pH Tracer

Code 1741 • NH (1)

- Provided with 4, 7, and 10 pH buffer tablets
- Range: 0.00 to 14.00 pH/0.01 pH
- Temp: 23° to 194°F (-5° to 90° C)
- Resolution: 0.01 pH
- Rugged flat surface electrode will alert user when it's time to "RENEW"
- A "CAL" indicator shows when to recalibrate and user can select a 1, 2, or 3 point calibration

- Includes Automatic Temperature Compensation and displays temperature while showing pH result
- Optional interchangeable probes for Total Chlorine (code 1732) and ORP (code 1734) measurement in water. Replacement pH Probe (code 1733)
- Auto-off after 10 minutes
- Power: Four 3VCR-2032 batteries



Code
1766

pH/TDS/SALT Tracer

Code 1766 • NH (1)

- Measures five parameters including Conductivity, TDS, Salinity, pH, and Temperature using one electrode
- Units of measure: pH, μ S, mS, ppm, ppt, mg/L, °C, °F
- Memory stores up to 25 labeled readings
- Adjustable Conductivity to TDS ratio
- Auto power off and low battery indicator

OPTIONS:

- Replacement Electrode for 1766 only • Code 1755
- Weighted Stand w/Sample Cups (5) • Code 1746
- Sample Cups w/caps (24) • Code 1745
- Conductivity Standards, see page 4

	Range	Resolution	Accuracy
Conductivity	0 to 199.9 μ S, 200 to 1999 μ S, 2.00 to 19.99 mS	0.1 μ S	\pm 1%
TDS/Salinity	0 to 99.9 ppm (mg/L), 100 to 999 ppm (mg/L), 1.00 to 9.99 ppt	0.1 ppm (mg/L)	\pm 2%
pH	0.00 to 14.00 pH	0.01 pH	\pm 0.01 pH
Temperature	32° to 149°F (0 to 65°C)	0.1°F/°C	\pm 1.8°F/°C

Standardized pH Buffer Solutions

For use in calibration of pH meters. Available in 120mL and 500mL sizes.

pH Value	Code
4.01	2866
7.00	2881
10.00	2896

Note: Other pH values available



Buffer Tablets

Add one tablet to 20 mL of Deionized Water to produce buffers. Available in 50, 100, and 1000 tablet packs. In foil strips of 10 tablets each.

pH Value	Code
4.0	3983A
7.00	3984A
10.0	3985A



Dissolved Salts Meters & Accessories

High levels of soluble salts in the soil can be caused by excessive fertilization, insufficient watering, poor drainage, or by some contributing salt water intrusion. High concentrations of soluble salts can inhibit plant growth and will reduce overall crop yields. Greenhouse plants and other sensitive crops may be damaged if soluble salts exceed 2000 ppm. Soluble Salts, or Total Dissolved Salts, are measured by means of a Conductivity Meter. A conductivity reading measures the capacity of a solution to conduct an electric current and is directly related to the total ionic concentration of dissolved substances in the solution. Thus, the conductivity reading of a soil extract can be converted into a reading of Total Dissolved Salts to indicate combined levels of sulfates, chlorides and other salts in the soil. Extract is prepared using distilled water, not included with meters.



Code
5-0036-01

LaMotte TDS 6 Series Meter

TDS 6 (without carrying case)

Code 5-0036-01 • NH (3)

TDS 6 (with carrying case)

includes two calibration standards

Code 5-0037-01 • NH (5)

Microprocessors have enabled meter manufacturers to combine many features into smaller designs with better accuracy. Meter includes electrode and temperature probe, and is available with or without a carrying case.

FEATURES:

- Push button operation
- Calibration 1 per range
- Range: 0.0-10.0, 100.0, 1,000 ppm, 1.0-10.00, 100.0, 200 ppt
- Power: Four AAA batteries included
- Temperature readout 0-100°C/0.1°C
- Automatic Temperature Compensation
- Auto-off after 17 minutes
- Hold function
- Adjustable conductivity to TDS factor
- Instructions included for measuring TDS in soil
- Meter has a two-year warranty



Code
1749

EC/TDS/SALT TRACER

Code 1749 • NH (1)

- Easy to use
- 2% accuracy for EC, TDS, and Salt modules
- Automatic temperature compensation
- Self calibration
- Memory can store up to 15 readings
- Automatic shut-off and low battery indicator; uses four 3V CR-2032 button batteries
- Auto Off after 10 minutes

OPTIONS:

- EC/TDS/SAL Replacement Electrode • Code 1765
- Weighted Stand w/Sample Cups (5) • Code 1746
- Sample Cups w/caps (24) • Code 1745
- Conductivity Standard, 84 μS • Code 6312-G
- Conductivity Standard, 1413 μS • Code 6354-G
- Conductivity Standard, 12,880 μS • Code 6317-G

Conductivity:	0 to 199.9 μS , 200 to 1999 μS , 2.00 to 19.99 mS
TDS:	0 to 99.9 ppm (mg/L), 100 to 999 ppm (mg/L), 1.00 to 9.99 ppt (g/L)
Salinity:	0 to 99.9 ppm, 100 to 999 ppm, 1.00 to 9.99 ppt
Accuracy:	EC, TDS, Salt: $\pm 2\%$ FS; Temperature: $\pm 1^\circ\text{C}$ (1.8°F)



Conductivity/TDS Solutions

The following potassium chloride solutions can be used to standardize conductivity meters. TDS values are based on a 0.7 conversion from conductivity.

Code	Description	Size
6312-L	84 $\mu\text{S}/\text{cm}$, 59 ppm	500 mL
6354-L	1,413 $\mu\text{S}/\text{cm}$, 989 ppm	500 mL
6317-L	12,880 $\mu\text{S}/\text{cm}$, 9016 ppm	500 mL



All of the LaMotte soil test kits measure the portion of the soil nutrient that would be available for the plant to use. Since extraction is not complete, the amount that is measured is relative, dependent on the extraction procedure. Pounds per acre represent the number of pounds of soil in an acre to the plow depth of 6-7 inches, or 2,000,000 lbs.

Electronic Labs

ELECTRONIC SOIL LAB

Model SCL-12

Code 1985-04 • HF (37)

Reagent Refill • Code R-1985-04

Model SCL-15 w/out pH & Dissolved Salts Meters

Code 1988-02 • HF (33)

Reagent Refill • Code R-1988-02

The LaMotte Model SCL-12 is designed to provide the landowner, consultant, or fertilizer specialist with a method for achieving immediate and economical soil analyses in the field without sacrificing accuracy. The Model SCL-12 is a self-contained, electronic soil analysis laboratory that provides accurate answers anywhere for fifteen soil factors, including available forms of macronutrients and critical micronutrients. The SMART 2 Colorimeter instantly analyzes color reactions developed in nutrient tests. Display readings are multiplied by a conversion factor specific to each test to provide a result in parts per million (ppm) or pounds per acre (lb/acre) — no further calculations are necessary. The simplified test procedures provide at least 20 tests for each soil nutrient. Each accurately standardized system is furnished in an individual plastic module for quick distinction. All tests are performed in minutes on easy-to-prepare soil extracts, based on Mehlich I extraction. Critical soil pH measurements are performed quickly and reliably with a battery-powered pH 5 meter. The meter measures the pH of a one-to-one solution of soil and distilled water over the range of 0-14 pH units to a sensitivity of ± 0.01 pH. Soluble Salt levels in soils and irrigation waters are monitored accurately with a TDS 6 meter, measuring Dissolved Salts from 0-999+ ppm.

Colorimeter Tests	Method	Range*	# Tests
Nitrate Nitrogen*	Cadmium Reduction	0-300 lb/acre	20
Nitrite Nitrogen	Diazotization	0-40 lb/acre	20
Ammonia Nitrogen*	Nesslerization	0-200 lb/acre	50
Phosphorus*	Ascorbic Acid Reduction	0-99 lb/acre	50
Potassium*	Tetraphenylboron	0-500 lb/acre	100
Sulfur	Barium Chloride	3-94 ppm	50
Copper	Diethyldithiocarbamate	0-30 ppm	100
Iron	Bipyridyl	0-30 ppm	50
Manganese	Periodate	0-75 ppm	50
Zinc	Zincon	0-15 ppm	50
Direct Reading Titrator Tests:			
Calcium		0-4000 lb/acre	50
Magnesium		0-2400 lb/acre	50
Chloride		0-1000 lb/acre	50
Battery-Powered Meters:			
pH 5		pH 0-14	
TDS 6		0-10.00, 100.0, 1,000 ppm 1.00-10.00, 100, 200 ppt	

*See table at right for unit conversion factors

UNIT CONVERSION FACTORS:

Results can be measured using a choice of units, explained here. Parts per million (ppm), pounds/acre, and Kg/hectare units can be converted to each other using these values:

Area	Soil Depth	Soil Weight
1 acre	6-7 inches	2 million lb
1 hectare	15-18 cm	2.25 million Kg

ppm	lb/acre	Kg/hectare
0.5	1	1.12
1	2	2.24
0.89	1.78	1

A number of variables must be considered when interpreting soil test results in addition to the values obtained. These variables include the composition of the soil, drainage, climate, previous fertilizer programs, and the type of plant to be grown. Samples must also be truly representative of the area being studied and must be carefully selected.



Agricultural Outfits

AST-5 • CODE 5410

Test Factor	Tests	Range*
pH	100	pH 4.5-8.0
Nitrate Nitrogen	100	2.5-100 lbs/acre
Phosphorus	100	15-150 lbs/acre
Potassium	100	L-H 120-200 lbs/acre
Humus (Organic Matter)	100	L-H 1a%-8%

*See page 5 for unit conversion factors

AST-15 • CODE 5412-01

Test Factor	Tests	Range*
pH	100	pH 4.5-8.0
Nitrate Nitrogen	100	2.5-100 lbs/acre
Phosphorus	100	15-150 lbs/acre
Potassium	100	L-H 120-200 lbs/acre
Humus (Organic Matter)	100	L-H 1a%-8%
Calcium	100	0-5,000 ppm
Magnesium	100	0-120 ppm
Ammonia Nitrogen	100	10-80 lbs/acre
Manganese	100	L-H 4-40 ppm
Aluminum	100	L-H 5-125 ppm
Nitrite Nitrogen	100	0.5-25 lbs/acre
Sulfur	100	0-100 ppm
Chloride	100	0-1000 ppm
Ferric Iron	100	2.5-5.0 ppm
Copper	100	0.25 ppm/drop

*See page 5 for unit conversion factors



MODEL AST SERIES ADVANCED AGRICULTURAL SOIL TESTING OUTFITS

MACRONUTRIENTS, pH, & HUMUS

Model AST-5 • Code 5410 • HF (15)
Reagent Refill • Code R-5410

MACRONUTRIENTS, MICRONUTRIENTS, & pH

Model AST-15 • Code 5412-01 • HF (21)
Reagent Refill • Code R-5412-01

This line of combination soil analysis outfits offers the finest visual color matching system available to today's agronomist. Technically advanced reagent systems and unique extraction procedures based on the Mehlich I extraction provide fast, simple and extremely accurate soil testing. Soil nutrients are drawn from the test sample, providing a clear liquid extract. The addition of an indicator reagent to the clear extract produces a color reaction in direct proportion to the nutrient concentration in the test solution. The developed color is read against permanent, translucent color standards provided in the Octa-Slide Comparator. The result is a simple and distinct color match over a broad test range. Tests for calcium, magnesium and chloride are performed with an easy-to-use Direct Reading Titrator. Reagent is dispensed into the soil extract until an endpoint color change is reached, then results are read directly from the titrator in parts per million. Measurement of potassium is conducted with a unique turbidity tube system. Copper is determined by means of a drop count method, and humus is measured against a color chart index with five color standards. The AST outfits also include simplified procedures for screening of nitrates, phosphorus and potassium in plant tissues. Both Model AST outfits are furnished in rugged, lightweight carrying cases with components securely mounted in removable foam-lined trays. This format permits easy conversion from an in-store lab to service in the field. Each kit includes simplified and complete instructions, a pad of soil analysis report forms, instructions for collecting representative soil samples and a copy of the LaMotte Soil Handbook. This handbook contains charts with data on the nutrient needs of various crops. It also contains general information on using soil test results to determine actual lime and fertilizer requirements for optimal plant growth. Available in two models. See charts at left.



MODEL STH SERIES

COMBINATION SOIL OUTFITS

MACRONUTRIENTS & pH

Model STH-4 • Code 5029 • HF (10)
Reagent Refill • Code R-5029 • HF (5)

MACRONUTRIENTS, pH, HUMUS, CALCIUM, & MAGNESIUM

Model STH-7 • Code 5061 • HF (12)
Reagent Refill • Code R-5061 • HF (6)

MACRONUTRIENTS, pH, & HUMUS

Model STH-5 • Code 5007 • HF (12)
Reagent Refill • Code R-5007 • HF (6)

MACRONUTRIENTS, MICRONUTRIENTS, & pH

Model STH-14 • Code 5010-01 • HF (20)
Reagent Refill • Code R-5010-01 • HF (10)

The Model STH Combination Soil Outfits have offered simplified methods for determination of available nutrients found in agricultural soils for over forty years. Since the original introduction of the STH series, based on Morgan soil test methods, reagent systems have been updated constantly with new advancements in modern chemistry. A series of rapid, accurate chemical tests use standardized reagents to produce color reactions measured against laminated color charts. All STH outfits are furnished in lightweight carrying cases with components securely mounted in removable foam trays. This format provides flexibility for the in-house specialist who also wants to make quick problem determinations in the field. Colorimetric test methods are used for most test factors. Tests for calcium, sulfate and chlorides are based on turbidity measurements. Potassium analysis also employs a turbidity measurement, using a unique reading device designed in LaMotte laboratories to read directly in pounds per acre. A single extraction procedure, using Morgan Universal Extraction Solution, provides the liquid soil extract for all the nutrient tests with the exception of chloride, which is extracted with demineralized water. The Humus Screening Test, performed on a soil sample-demineralized water suspension, employs five color standards for rapid measurement of humus content of the soil. Soil pH is determined colorimetrically, using a series of pH indicators and color charts covering the range of pH 3.8 to 9.6. The STH outfits also include simplified procedures for screening nitrates, phosphorus, and potassium in plant tissues. Complete reagent refill packages are available for each STH outfit. Each kit includes complete instructions, a soil management handbook and a pad of soil analysis report forms. The LaMotte Soil Handbook contains general information on interpretation of test results for determination of lime and fertilizer requirements. Available in four models. See chart to the right.

Agricultural Outfits

STH-4 • CODE 5029

Test Factor	Tests	Range*
pH	100	pH 3.8-9.6
Nitrate Nitrogen	50	10-150 lbs/acre
Phosphorus**	50	10-200 lbs/acre
Potassium	50	100-400 lbs/acre

STH-5 • CODE 5007

Test Factor	Tests	Range*
pH	100	pH 3.8-9.6
Nitrate Nitrogen	50	10-150 lbs/acre
Phosphorus**	50	10-200 lbs/acre
Potassium	50	100-400 lbs/acre
Humus (Organic Matter)	50	L-H 1½%-8%

STH-7 • CODE 5061

Test Factor	Tests	Range*
pH	100	pH 3.8-9.6
Nitrate Nitrogen	50	10-150 lbs/acre
Phosphorus**	50	10-200 lbs/acre
Potassium	50	100-400 lbs/acre
Humus (Organic Matter)	50	L-H 1½%-8%
Calcium	50	150-2800 ppm
Magnesium	50	L-H 5-150 ppm

STH-14 • CODE 5010-01

Test Factor	Tests	Range*
pH	100	pH 3.8-9.6
Nitrate Nitrogen	50	10-150 lbs/acre
Phosphorus**	50	10-200 lbs/acre
Potassium	50	100-400 lbs/acre
Humus (Organic Matter)	50	L-H 1½%-8%
Calcium	50	150-2800 ppm
Magnesium	50	L-H 5-150 ppm
Ammonia Nitrogen	50	L-H 5-150 ppm
Manganese	50	L-H 4-40 ppm
Aluminum	50	L-H 5-125 ppm
Nitrite Nitrogen	50	1-50 ppm
Sulfate	50	50-2000 ppm
Chloride	50	25-500 ppm
Ferric Iron	50	5-125 lbs/acre

*See page 5 for unit conversion factors

**For non-alkaline soils. Code 5090 Phosphorus Auxiliary package recommended for alkaline soils.



Turf, Garden & Education Outfits



Code 5414

TURF LAB FIELD UNIT Ideal for Grounds Maintenance and Landscape Professionals

Model TL-2 • Code 5414 • HF (21)
Reagent Refill • Code R-5414 • HF (10)

Today's turf specialists have a great deal of new technology at their disposal. Developments in machinery, seeds, and turfgrass research have resulted in greater plant response rates and more productive turf management programs. The Turf Lab test kit employs the same chemistry as the AST series (pg 6). A 6 inch (15 cm) brass soil sampler with a small 3/8 inch (1 cm) core diameter easily removes soil samples from the turf. A pad of soil report forms, soil sampling bags, and a copy of the LaMotte Soil Handbook are furnished with complete reagents and labware in a rugged carrying case.

MODEL TL-2 • CODE 5414

Test Factor	Tests	Range
pH	100	pH 4.5-8.0
Phosphorus	50	15-150 lbs/acre
Potassium	50	L-H 120-200 lbs/acre
Nitrogen	50	10-150 lbs/acre
Iron	50	1.25-25 ppm
Calcium	50	0-200 ppm
Magnesium	50	0-120 ppm
Texture	50	Clay, silt, sand fractions
Temperature	0° to 100°C (32°-212°F)	

MODEL EL GARDEN KIT

Model EL • Code 5679 • R2 (4)
Reagent Refill • Code R-5679 • R2 (3)

A simple test kit for soil science education or garden analysis. Rapid test procedures, diagramed instructions, and laminated color charts are used to measure concentrations of nitrogen, phosphorus, potassium (15 tests each), and soil pH (30 tests). The Garden Guide manual and LaMotte Soil Handbook are included to interpret test results and give lime and fertilizer recommendations.



Code 5679

EDUCATIONAL TEST KITS

Kits are supplied with unit dose, non-hazardous TesTabs®. Sufficient tablets to run 50 repetitions of each test factor. Simple diagrammed instructions, hardware, and laminated color chart included.

Soil NPK Kit

Code 3-5880 • NH (1)

- Tests for nitrogen, phosphorous and potassium
- Results reported as Low, Medium and High

Soil pH Kit

Code 5912 • NH (1)

- Tests for pH in the range of 4.0-11.0 in 1.0 pH units



Individual Test Kits



Code 5012

HUMUS

Humus is organic matter which has decomposed to where it can contribute nutrients for plant uptake.

Code/Model	Method	Range & Sensitivity	Reagent System	# of Tests	Shipping Code (Wgt/Lbs)
5012/STH-1	Color Chart, filtered extraction	Low to high in 5 increments, 1½-8%	EDTA	50	NH (2)

ORGANIC MATTER

Organic matter is important to soil in that it serves as a reservoir for moisture and nutrients which will eventually become available to the plant.

Code/Model	Method	Range & Sensitivity	Reagent System	# of Tests	Shipping Code (Wgt/Lbs)
5020/ST-OR	Large-scale buret titration	0-1.6% by wt. Organic Matter	Acid-Dichromate mixture, 5 reagents	25	HF (16)

pH

The pH value affects all mineral elements and the biological processes made available to plants from the soil. Accurate pH testing is essential to determine lime requirements and to insure that a mineral-rich soil is also a fertile one.

Code/Model	Method	Range & Sensitivity	Reagent System	# of Tests	Shipping Code (Wgt/Lbs)
5023/ST-M	5 Color Charts & Spot plate Morgan Method	pH 3.8-8.4 in 0.2 increments (not for heavy clays)	5 individual pH indicators	50	R2 (3)
5024/ST-T	Color Chart & Spot Plate	pH 4.0, 5.0, 6.0, 7.0, 8.0	Duplex Indicator	100	R1 (1)



Code 5023



Code 1069

TEXTURE

The overall texture of a soil affects growth in the root zone, which determines the above-ground growth production, and is determined by the fractions of sand, silt, and clay present.

Code/Model	Method	Range & Sensitivity	Reagent System	# of Tests	Shipping Code (Wgt/Lbs)
1067	Settling	Determines sand, silt, & clay fraction, texture determined by chart	Dispersion, Flocculation	50	NH (2)

PLANT TISSUE TESTING

Plant tissue testing provides essential information concerning plant use of nutrients vital to their growth. These simplified field tests for green plant tissue indicate whether growing plants are receiving adequate amounts of available nutrients from the soil. All tests give qualitative results for the specific nutrients. By comparing test results from healthy and problem plants, it is possible to pinpoint deficiencies or excessive nutrient conditions.

MACRONUTRIENT PLANT TISSUE KIT

Model PT-3R • Code 5026 • HF (3)

Reagent Refill • Code R-5026 • HF (2)

A complete kit for determining nitrates, phosphorus and potassium in plant tissue.

Diced green plant tissue is saturated in a Universal Extracting Solution to prepare a single liquid extract for use with all three tests. Qualitative results given as abundant, adequate, deficient only. Reagents for 50 tests per factor.

MICRONUTRIENT PLANT TISSUE KIT

Model PT-04 • Code 5261 • R1 (3)

Reagent Refill • Code R-5261 • R1 (2)

Includes tests for ferrous and ferric iron, zinc, copper, manganese, and boron. Each test is made from the sap of plant tissues, which is extracted by squeezing the tissue with pliers. Comparative tests are made between a healthy plant and a similar one showing deficiency symptoms. "Spot" tests indicate presence or absence only. Reagents for 50 tests each factor.



Code 5026

Hydroponics Outfits

Hydroponic culture is the growing of plants in a controlled environment with nutrient solutions, but without the use of soil as the supporting medium. Plant roots are fed directly, which is in contrast to conventional growing methods where plant food is applied to the soil and the roots extract the nutrients from the soil. Plants are either grown directly in nutrient solutions with only structural support or in beds through which nutrient solutions are periodically recirculated. Unlike field crops, hydroponically grown plants can be grown at great densities and with less concern about diseases initiated in soils or by insects and weeds. Hydroponics has played a significant role in modern plant nutrition research. Scientists are able to isolate the effects of essential minerals on various stages of plant growth and to study the effects of single element deficiencies under controlled conditions. Over the years, such research has contributed to dramatic increases in hydroponic productivity and to a greater understanding of the growth potential achievable with chemical fertilizer applications.



HYDROPONICS COMBINATION OUTFIT

Model AM-41 • Code 5406 • HF (15)
Reagent Refill • Code R-5406 • HF (3)

A portable outfit with simplified testing of nine essential nutrients at an economical price. Colorimetric tests use Octet Comparators with permanent color standards for accurate visual color comparison. Simplified titration procedures use specially calibrated Direct Reading Titrators. Qualitative tissue tests for each nutrient are also included. Reagents for 50 tests per factor are supplied. An operator's manual and 75-page handbook included.

Octet Comparator Tests

pH	pH 4.8-7.6
Nitrate Nitrogen	5-200 ppm*
Ammonia Nitrogen	1-8 ppm
Phosphorus	3-30 ppm
Sulfate	0-200 ppm

Direct Read Turbidity Tube

Potassium	0-250 ppm
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Direct Reading Titrator Tests

Calcium	0-2000 ppm
Magnesium	0-1200 ppm

Spot Test for Detection Of

Iron	at 0.25 ppm
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*By dilution

HYDROPONICS 4-in-1 TEST KIT

Model HP-1 • Code 3561 • HF (7)
Reagent Refill • Code R-3561 • HF (2)



An abbreviated version of our popular Model AM-41, the new Model HP-1 offers tests for pH and three key nutrient factors: nitrogen, phosphorus and potassium. It allows the hydroponic hobbyist to maintain proper nutrient balance and to achieve optimum growing conditions in soil-less cultures. Reagents sufficient for 50 tests per factor and complete labware are foam-mounted in a sturdy carrying case. Instructions and 75-page hydroponics handbook are supplied.

Octa-Slide Comparator Tests

pH	pH 4.5-8.0
Nitrate Nitrogen	5-200 ppm*
Phosphorus	3-30 ppm

Direct Reading Turbidity Tube

Potassium	0-250 ppm
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*By dilution

pH HYDROPONICS TEST KIT

Model HPH • Code 5074 • R1 (1)
Reagent Refill • Order 5132-G • R1 (1)

Simply add pH indicator reagent to the sample solution in a test tube for a color reaction. The resulting color is read in an Octet Comparator with permanent color standards for pH values of 4.8, 5.2, 5.6, 6.0, 6.4, 6.8, 7.2, and 7.6. The kit has sufficient reagent for 50 tests and is packaged in a compact box.





Sampling Equipment

SOIL SAMPLER

Coring Tube, 3 ft (1 m) • Code 1016 • NH (6)

This chrome-plated steel sampler takes samples in all types of soils to a depth of 3 feet (1 m). The 12 inch (30 cm) sampling tube has a durable cutting tip and a cutaway wall for inspection and easy removal of the soil core. Attach the tube directly to the 12 inch (30 cm) handle bar or interpose one or both 12 inch (30 cm) extension rods, depending on desired sampling depth. The extension rods are marked at 6 inch (15 cm) intervals for accurate measurement of sampling depth.

SPOT PLATE

**Plastic, Two-Well
Code 0159 • NH (1)**

Of white plastic. Two wells. 24mm x 8mm deep. Draining channels 8mm wide x 3mm deep run to smaller wells 10mm diameter x 4mm deep. Plate is 85mm x 75mm.



SPOT PLATE

**Porcelain, Coors
Code 2-2537 • NH (1)**

Glazed throughout with exception of bottom surface. The 112 x 92mm plate is 7mm thick and has twelve wells 5mm deep.

SOIL SAMPLER

Model GC-1 • Code 1159 • NH (1)

Rugged brass auger designed for sampling turfgrass soil, greenhouse soils, or wherever a small core size is desirable; $\frac{3}{16}$ inch diameter, 6 inch depth (1 x 15 cm). Brass handle doubles as a plunger for core removal.

SOIL SAMPLING BAGS

Package of 100 • Code 0615-J • NH (2)

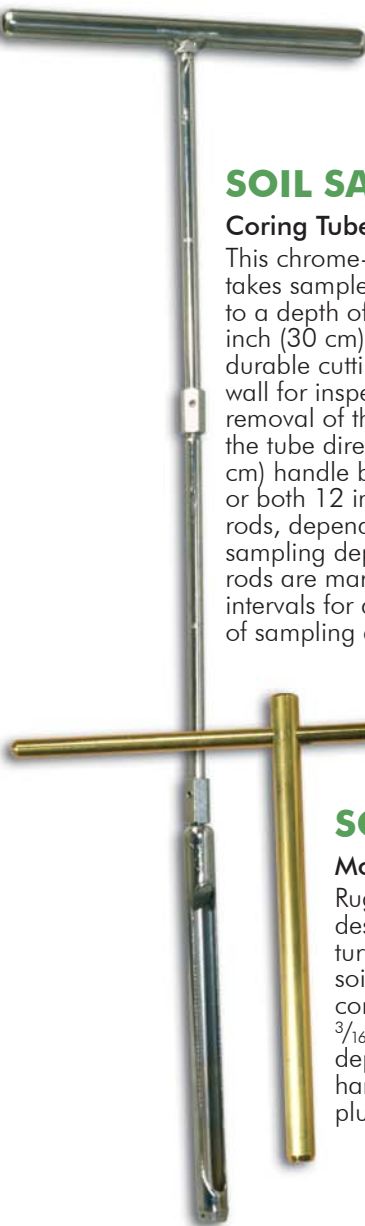
These 6 x 4 inch (15 x 10 cm) plastic zip-lock bags have instructions for collection and preparation of soil samples printed directly on each bag. By preventing contamination or accidental mixing of different samples, these convenient soil bags help insure accurate test results.



SOIL SAMPLER

Model EP • Code 1055 • NH (2)

The galvanized steel sampler has a saw-toothed cutting edge tapered for easy core removal. The cutaway side of the tube permits inspection of soil core. The Model EP takes a one-inch core sample to a depth of 10 inches (25 cm) and is furnished with 20 LaMotte Soil Sampling Bags.



Handbooks & Catalogs

THE LAMOTTE SOIL HANDBOOK

Order Code 1504

Staff, LaMotte Company
This 60-page "growers' manual" discusses major and minor nutrients, trace elements, soil pH, organic matter, soil texture, etc. Includes lime and fertilizer recommendations for a variety of crops and plants.

PLANT NUTRITION STUDIES

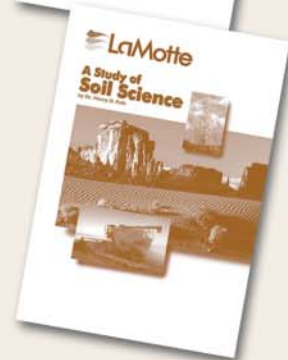
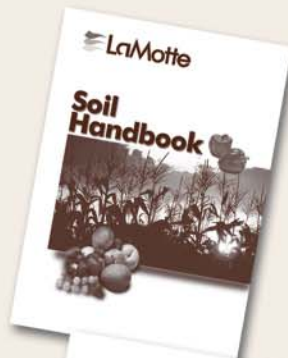
Order Code 1596

Dr. Robert Stegner
This 76-page manual covers the study and practice of hydroponics: plant culture in soil-less nutrient solutions. Includes a series of laboratory procedures and open-ended investigations.

A STUDY OF SOIL SCIENCE

Order Code 1530

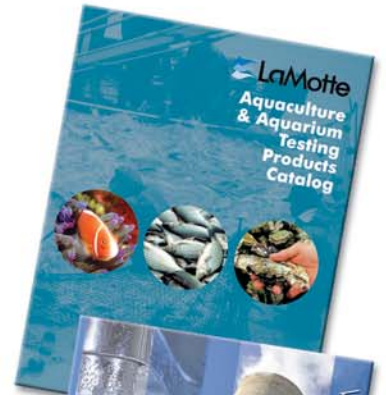
Dr. Henry D. Foth
This 44-page booklet provides an introduction to soil formation, soil pH, mineral elements, and plant nutrition, the life cycle of growing plants, and soil fertility management.



AQUACULTURE TESTING PRODUCTS

Order Code 1612

Test kits and instrumentation designed for the fish farm, hatchery, and research institutions. Equipment designed for monitoring water quality conditions on-site and for benchtop locations. Test equipment also featured for the aquarium hobbyist, the retailer, and the ornamental culturist.



WATER QUALITY TESTING PRODUCTS

Order Code 1653

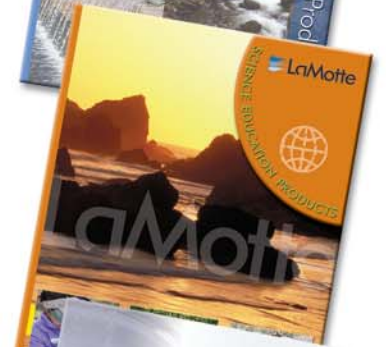
A complete guide to instruments, apparatus, kits, and reagents. This catalog features the best available test equipment for testing a variety of waters. LaMotte individual and combination kits, and instrumentation are featured.



ENVIRONMENTAL SCIENCE PRODUCTS

Order Code 1590

"Hands-on" test equipment for air, soil, and water chemistry students in elementary, secondary, vocational, outdoor, and college science programs.



WATER CONDITIONING TESTING PRODUCTS

Order Code 1650

Softener sales demonstration outfits and other specialized test equipment for the point-of-use water treatment industry.



POOL & SPA WATER TESTING PRODUCTS

Order Code 1634

A complete line of test kits, combination outfits, and meters for pool service professionals, public pool or spa operators, and private pool or spa owners.

