



MAGNESIUM & MANGANESE SOIL TESTS

MODULE C

MODEL AM-32 • CODE 5938-01

QUANTITY	CONTENTS	CODE
30 mL	*Magnesium Test Solution #1	*5140-G
30 mL	*Manganese-Magnesium Solution #2	*5145WT-G
10 g	Manganese Buffer Reagent	6310-D
15 g	*Manganese Periodate Reagent	*6311-E
1	Filter Paper, 50/pk	0465-H
2	Spot Plates, double, plastic	0159
2	Test Tubes, 1-8 mL, plastic, w/caps	0755
2	Plastic Rods, stirring	0519
1	Spoon, 0.5 g	0698
1	Test Tube, plastic, filtrate	0749
1	Funnel, plastic	0459
1	Color Chart, Magnesium in Soil	1306
1	Color Chart, Manganese in Soil	1307-01
1	Pipet, plain, plastic	0364
1	Pipet, plain, glass w/cap	0371
2	Spoons, 0.05 g	0696

***WARNING:** Reagents marked with a * are considered to be potential health hazards. To view or print a Material Safety Data Sheet (MSDS) for these reagents see MSDS CD or www.lamotte.com. To obtain a printed copy, contact LaMotte by email, phone or fax.

To order individual reagents or test kit components, use the specified code number.

WARNING! This set contains chemicals that may be harmful if misused. Read cautions on individual containers carefully. Not to be used by children except under adult supervision

EXTRACTION PROCEDURE

1. Fill a test tube (0755) to line 7 with *Universal Extracting Solution (5173).
2. Use the 0.5 g spoon (0698) to add four level measures of soil to the test tube. Cap and shake for one minute.

NOTE: When adding samples with high concentrations of carbonates to *Universal Extracting Solution (5173), swirl tube to mix for 30 seconds before capping to allow gases to escape.

3. Fold a piece of filter paper (0465) in half, then in half again. Press corners together to form a cone. Place in funnel (0459). Pour extract solution into funnel, collecting extract. This clear extract is used for the test.

MAGNESIUM TEST

1. Use a transfer pipet (0364) to add ten drops of soil extract to a large depression on a spot plate (0159).
2. Add one drop of *Magnesium Test Solution (5140). Stir with a stirring rod (0519). Solution will turn pale yellow.
3. Add one drop of *Manganese-Magnesium Solution #2 (5145WT). Stir with a stirring rod. Compare to color standards on Magnesium in Soil Color Chart (1306). Continue adding *Manganese-Magnesium Test Solution #2 one drop at a time until sample color matches a color standard. Record as ppm Magnesium.

NOTE: It usually requires 2 drops of *Manganese-Magnesium Test Solution #2 to cause color change.

INTERPRETATION OF MAGNESIUM TEST

Soils giving a very low test should be treated with dolomitic lime or fertilizers, such as double-manure salts, which contain considerable magnesia. Soils giving high, or very high, magnesium tests, with low calcium tests, should receive applications of gypsum or high calcic lime, in order to prevent calcium deficiency, due to over-balance of magnesium.

MANGANESE TEST

1. Use a transfer pipet (0364) to add 10 drops of soil extract to the large depression on a spot plate.
2. Use the 0.05 g spoon (0696) to add one measure of Manganese Buffer Reagent (6310). Mix with a clean stirring rod (0519) until the powder dissolves.
3. Use the other 0.05 g spoon (0696) to add one measure of *Manganese Periodate Reagent (6311). Mix with a clean stirring rod for 20 seconds.

NOTE: The *Manganese Periodate Reagent will not dissolve completely.

4. Match the color in the spot plate to a color standard on the Manganese in Soil Color Chart (1307-01). Record as ppm Manganese.

NOTE: Immediately clean the spot plate to prevent staining.

INTERPRETATION OF MANGANESE TEST

Manganese occurs in small amounts in all soils, chiefly in insoluble combinations. In some calcareous soils and acid soils, which have been heavily limed, practically no manganese is present in active forms, and some crops are unable to obtain even the small amount necessary to meet their requirements. Poor growth and a yellow, chlorotic condition results.

On the other hand, strongly acid soils may contain injurious concentrations of active manganese compound. Under some conditions liming is a corrective measure.

Manganese is changed by oxidation to less active forms, or may be leached from the soil. Hence, tests are of most significance when made just prior to planting, or during crop growth. A negative test at such time indicates the desirability of applying manganese. Twenty-five pounds of commercial manganese sulfate per acre is usually adequate to correct any possible deficiency. It is doubtful if manganese is needed if any positive test whatever is developed. Medium, or low, tests are of little significance, except as indicating no manganese deficiency. High, or very high tests are undesirable and indicate a need for lime.

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PO Box 329 • Chestertown • Maryland • 21620 • USA
800-344-3100 • 410-778-3100 (Outside U.S.A.) • Fax 410-778-6394
Visit us on the web at www.lamotte.com