

URI MASTER GARDENERS PROGRAM

SOIL TESTING SOP

Revised February 2017

URI MASTER GARDENERS PROGRAM SOIL TESTING HANDBOOK

STANDARD OPERATING PROCEDURES INDEX

SECTION DESCRIPTION

1. General Topics: Message from URIMGP President
 - 1.1. Mission Statement
 - 1.2. Kiosk Etiquette
 - 1.3. Soil Testers
 - 1.4. Soil Testing Functions
 - 1.5. Soil Testing Statistics
 - 1.6. Coordination of Soil Testing Events
 - 1.7. Material/Supplies for Soil Test Kits
 - 1.8. Materials needed to be supplied by Sponsor
2. Soil Testing Table Flow Chart
3. Meter Operation
4. pH Test
5. Increasing pH
6. Decreasing pH
7. Meter Storage

EXHIBITS

1. Plant pH Preferences
2. URI Fact Sheets
3. Material Safety Data Sheets
4. pH Meter Instruction Manual

Message from past MGP President

“As projects, the public, and organizations across the state begin to open existing gardens or establish new ones there is a great demand for soil testing by our expert team of URIMGP soil testers. The demand can be very high Spring through Fall with as many as 100 people requesting testing at one event.”

To serve all these soil testing needs, it is important to instruct **ALL** requests to the URI Master Gardener Program website and complete the “Request a Soil Testing Service” form. **NO** other request will be processed. **EVERYONE MUST** complete this online form to be considered for hosting a soil event. In this way the soil testing leaders and event coordinators can manage the requests and ensure that they have volunteers to places to conduct the soil testing.

SOP NO. 1.1

MISSION STATEMENT

The URI Master Gardeners Soil Testing Program is a community outreach service provided free of charge.

The soil test includes the soil pH and, where possible, soil texture. Our mission is to provide the results of the tests to the customer by translating the results into a workable garden plan and provide advice on good gardening practices.

SOP NO. 1.2

SOIL TESTING KIOSK ETIQUETTE

- Educating the customer is the main mission of the Soil Testing Program
- Soil Testers should be facing the customers and cease all conversations upon being approached
- The customer should be greeted in a friendly manner. This demonstrates that we are interested in his or her situation and that we want to assist him/her
- When a customer drops off a sample, engage him/her in a conversation regarding his/her request to be sure he/she has given us all the appropriate information we need to make a valid recommendation.
- When a customer picks up test results, engage him/her in a conversation regarding our recommendation to ensure that we took all factors into consideration in making our recommendation and to identify any inappropriate gardening practices.
- Upon completion of the conversation, say something like “Thank you for coming in today.”

SOP NO. 1.3

SOIL TESTERS

- Soil testing events will be staffed by Blue Pin Master Gardeners who have completed the Soil Testing Training Program and other testers-in-training.
- This training will be supplemented with “on the job coaching” by an experienced Soil Tester for the next event(s) that you participate in.
- Each soil tester must read and become familiar with the material in the Soil Testing Handbook.
- Each Soil Testing Event must have an experienced Soil Tester in charge of the event, referred to as the “Soil Test Event Leader”.

The Soil Test Event Leader is responsible for:

1. The proper set up of the Soil Test Table
2. Making Available an adequate supply of pre-numbered Soil Test Forms and pre-numbered cups.
3. Ensuring all functions are handled according to protocol and the SOP.
4. Ensuring any less-experienced Soil Testers are given adequate coaching and experience at performing the different functions.

SOP NO. 1.4

SOIL TESTING FUNCTIONS

Accepting Samples:

- Ensure that the customer completely fills out the Soil Test Form.
- Ask some general questions to ensure that we have obtained the correct information about the garden crop the customer is growing or plans to grow.
- With a permanent marker, write the number from the pre-numbered Soil Test Form on the customer's soil sample container.

Preparing Soil for Testing

- The soil sample must be sifted to eliminate stones and organic material. (Sticks and stones can break the glass probe of the meter)
- The sifted soil sample is then placed in the pre-numbered cup that corresponds with the pre-numbered Soil Test Form.

Performing Tests

- The soil texture should be noted on the Soil Test Form. If the soil sample is wet, it must be dried with paper towels before this test can be done.
- Add distilled/deionized water to sample until a fluid suspension is achieved and resembles a consistency of heavy cream.
- Insert meter, **hold cup and meter together** and swirl the suspension until the meter reading stabilizes to one decimal place. **Do not use meter as a stirrer.** Note: each test varies in the length of time to stabilize the meter.
- Record the reading (round to one decimal point) on the pre-numbered Soil Test Form. Top white copy of form is given to customer, bottom yellow copy to Soil Testing Project Manager.
- Formulate recommendations and record on the pre-numbered Soil Test Form
- Consult our reference material for plant pH Preferences (Exhibit 1).

Delivering Results to Customer

When the Customer returns to pick up the test results, talk with him/her and ask questions. Many customers do not know what questions to ask us thus we need to ascertain the issues they may have but are not aware of. This exercise often identifies inappropriate gardening practices. Another occasional benefit of this process is a better identification of the specific plant(s) being grown which could alter our recommendation.

SOP NO. 1.5

SOILD TESTING STATISTICS

Statistics on each event must be maintained

The purpose of recording these statistics is:

- Report to the URIMGP Council
- Determine which events should be continued or discontinued.
- Plan for next year's events.
- Determine the number of volunteers needed for events.

To accumulate accurate statistics, the following information must be recorded for each event:

- List of Master Gardeners participating
- Number of soil tests performed, and customers spoken with
- Comments on the extent of advertising for the event
- Weather conditions
- Suggestions for improvements for next year's event

SOP NO. 1.6

COORDINATION OF SOIL TESTING EVENTS

The Soil Testing Program Leader is a volunteer position which must be filled by an experienced Certified Soil Tester. The Soil test program leader is responsible for:

- Planning for events
- Notifying the Soil Test team leaders and regional manager of their responsibilities
- Maintaining the records of events and submitting yearly summaries
- Maintaining records of Certified Testers
- Planning and scheduling a yearly, or more if needed, certification class open to all MGA members
- Keep all concerned, informed of new soil testing, soil amendment, and regulatory information
- Coordinating an end of season review of the project's policies, procedures and events to recommend improvements
- Maintaining liaison with the Treasurer for reimbursement for soil testing expenses
- Coordinate with Hanna on pH meter issues; purchase meters when needed and maintain the supplies at the Outreach Center.

Responsibilities of the Regional Managers

- Provide and maintain equipment needed for the soil testing event kit.
- Maintain pH meters.
- Coordinate all soil testing activities in their respective territories.
- Report to the Program Leader after each event or monthly, whichever the Leader prefers, on the results of soil testing events in their territory.
- Inform the Leader of any issues, problems, etc.
- Develop and maintain a list of MGs who will serve as "runners" in their territories getting equipment to and from the different soil testing event leaders.

Responsibilities of the Soil Testing Event Scheduler

- Recruiting an adequate number of soil testers for each event.
- Drawing up a schedule of testing requests and reporting them to the program leader and URIMGP website manager for posting.
- Updating the Standard Operating Procedure Handbook.
- Compiling and updating a list of all Blue Pin, soil-test certified Master Gardeners.
- Ensuring that all Blue Pin, trained soil testers receive a copy of the Standard Operating Procedures.

Responsibilities of the Soil Test Event Team Leader

- Verifying there are enough qualified volunteers to staff the event.
- Ensuring that the sponsor has made proper preparations for the soil testing kiosk.
- Ensuring that a fully equipped soil test kit is at the event at least 1 hour before the start of the event.
- Ensuring that the table is set up and ready for testing prior to the beginning of the event, including an adequate supply of pre-numbered Soil Test Forms and matching testing cups.
- Ensuring that the Soil Test Kit is promptly returned to the Regional Manager in condition received.
- Compiling the Soil Testing Statistics Report and transmitting it to the Soil Testing Project Manager.

The Soil Testing Project is managed within the Public Education Program in conjunction with the Public Education Coordinator.

SOP NO. 1.7

MATERIAL/SUPPLIES NEEDED IN THE SOIL TEST KIT

- URI Master Gardener Soil Testing Handbook
- pH Meters (3 meters)
- Soil Test Forms
- Supply of plant pH preference forms for distribution
- Display signs
- Plastic cups
- Cleaning/storage solutions
- 4.0 Buffer solution
- 7.0 Buffer solution
- Sturdy and stable plastic cups to hold the buffer solutions and rinse water.
- Pens, pencils, and permanent markers.
- Paper towels (two rolls)
- Distilled/deionized water (minimum of two gallons; four for a large event)
- Distilled/deionized water dispensing bottles
- Plastic spoons and forks
- Sifters
- Container to hold completed soil test forms waiting for pick up

IMPORTANT NOTE:

Immediately after each Soil testing event the Soil Test Kit must be restocked and returned to the appropriate location so that it is ready for the next scheduled or unscheduled event.

SOP NO. 1.8

MATERIALS TO BE SUPPLIED BY SPONSOR

- Tables
- Chairs
- Shelter. If the event is to be outdoors a canopy is necessary for protection from rain or sun.
- Trash containers. Preference is to have two containers: one for the soil and one for the cups and soil sample containers.

SOP NO. 2

SOIL TESTING TABLE LAYOUT

See attached

SOP NO. 3

METER OPERATION

- Advance preparation: Set up 3 clean cups. From left to right pour 1 ounce of pH 7 buffer solution in the first cup, 2 ounces of distilled water into the second cup and 1 ounce of pH 4 buffer solution into the third cup.
- Turning on the Meter
 - Press and hold the MODE button (left button) until the unit powers up. It will go through a brief diagnostic sequence and will display Remaining Battery Life. The unit is now ready to be calibrated.

- Calibrating the Meter
 - Hold the MODE button again; it will display OFF and then CAL. Place the meter in the pH 7 buffer solution. The REC signal will light, and CAL will flash. Wait until the unit displays pH 4.01 USE
 - Quickly rinse the meter with distilled/deionized water in the second cup and then place it into the third cup with pH 4 buffer solution.
 - When the pH 4 buffer solution is accepted, the message, OK2 will be displayed and the CAL icon will remain on.
 - The meter is now ready for performing tests.
 - During slow periods, re-check the meter against both pH buffers and re-calibrate the meter if the pH drift has occurred.

SOP NO. 4 pH TEST

PREPARING THE SOIL SAMPLE FOR TESTING

- Sift the soil sample onto a paper plate to remove stones and organic matter. Three teaspoons of soil are an acceptable quantity.
- Perform a tactile evaluation on the soil sample to assess its texture and record the results on the pre-numbered Soil Test Form.
- Pour the sifted soil sample into the pre-numbered cup and add distilled water and mix to obtain a consistency of thin mud. (heavy cream)

PERFORM THE SOIL pH TEST

- Insert the meter into the sample. Keep the meter stationary and swirl the cup until the pH reading stabilizes
- Round off the reading to one decimal place and record on the pre-numbered Soil Test Form.
- Place the meter into a cup of distilled/deionized water. Change the water in this holding cup as needed.
- Formulate your recommendation and record it on the Soil Test Form. Consult the plant pH preference lists. If there are any questions, consult with your fellow soil testers.
- Discard the unused soil and the soil sample and clean up the work area and implements before starting the next soil test.

SOP NO. 5 INCREASING pH

- The general recommended rate of limestone application is fifty pounds per 1,000 square feet. This application rate will generally increase soil pH by 0.5 units and may take at least six months to achieve the full effect. If the pH must be changed by more than 0.5, then subsequent applications of fifty pounds at six-month intervals will be required.
- Slow changes in pH reduce stress to soil microflora.
- Powdered and palletized limestone (calcitic and dolomitic) are both satisfactory. Powdered limestone is a bit messy, especially on windy days.

SOP NO. 6

DECREASING pH

- High pH soil samples result from improper sampling (recent application of lime) or, more commonly, **excessive use of wood ashes.**
- **The URI Master Gardeners advise that sulfur and aluminum sulfate can be deleterious to the health of soil – dwelling species and we do not advocate their use.**
- Because most high pH soil samples arise from the excessive use of wood ashes, it is usually best to let natural leaching processes remove the causative agent (potassium carbonate, K_2CO_3 , produces high pH and is *highly soluble*). Recommend that the customer apply no lime or wood ashes for two or more years and that pH testing be continued to monitor the soil's return to readings in the more-desirable neutral range.
- In cases where pH must be lowered to suit acid-loving plants, recommend application of peat moss or pine needles.

SOP NO. 7

METER STORAGE

- Rinse the probe and meter with distilled water to remove all debris.
- Press and hold the Mode button until OFF appears and then release immediately before the unit attempts to enter the CAL mode.
- Add a few drops of storage solution or pH 4 buffer to the small cup inside the bottom cap. **Do not use water!**
- Replace the bottom cap.