Soil Testing to Improve Your Lawn and Garden

*Buckeye ISA Project*

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OSU Extension – Franklin County
What is a Soil Test?

• A soil test is a laboratory test used to provide information on the constituents (nutrients, pH, organic material, buffering capacity, etc.) of the submitted soil sample.

• The grower/home gardener will be provided helpful information to maintain good plant health in lawns and gardens while maximizing productivity and reducing overuse of inputs (e.g. fertilizer).
Why do we test lawns and gardens?

- Soil tests summarize the nutrient content of the soil in production
- Soil testing labs can provide accurate recommendations guiding fertilizer use
- Test results provide information aiding in correct plant selection
- Soil test can help provide possible diagnosis in the event of an unhealthy plant
Why do we test lawns and gardens?

**Physical**
- Physical support for plants
- Root proliferation
- Water storage & movement
- Aeration
- Resistance to erosion

**Chemical**
- Nutrient storage & release
- Soil reactions (driven largely by pH)
- Energy / Carbon storage

**Biological**
- Pest suppression
- Nitrogen mineralization
- Organic matter decomposition
- Support of microbial community

Image: http://www.lawrie.co.com.au
Why do we test lawns and gardens?

Soil Fertility:

<table>
<thead>
<tr>
<th>Macro Elements</th>
<th>Secondary Elements</th>
<th>Micro Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>N - Nitrogen</td>
<td>Ca - Calcium</td>
<td>Fe - Iron</td>
</tr>
<tr>
<td>P - Phosphorous</td>
<td>Mg - Magnesium</td>
<td>B - Boron</td>
</tr>
<tr>
<td>K - Potassium</td>
<td>S - Sulphur</td>
<td>Zn - Zinc</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cu - Copper</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mn - Manganese</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mo - Molybdenum</td>
</tr>
</tbody>
</table>

CEC:

Image: http://www.humicacidinc.com/function-of-all-plantnutrients/#prettyPhoto

Image: http://grabngrowsoil.com/gardening-how-to/understanding-basic-soil-chemistry/
Why do we test lawns and gardens?

Soil pH:

Soil pH: The Width of the Bands = The Availability of the Nutrients to Plants

Image: Joe Boggs OSU Extension
Why do we test lawns and gardens?

Additional Tests:

- Possible contaminants
- Micronutrient test
- Soil texture (physical property based on sand, silt, and clay)
- Both test often require additional fee
- Soil texture is important if you intend to add soil to an existing plot
When do I Soil Test?

- You can soil test at any time of the year however be sure to take the test with enough time to evaluate the results.
- Consistency is key
- Make applications at the appropriate time of year
- Soil testing every 3 years is adequate
Tools Needed to Soil Test

1. Soil Probe

Soil probe is the best tool for soil sampling. The probe takes quick samples at the desired depth with easy removal of sample.

2. Two type of probes:
   a) T-Handle Probe
   b) T-Handle Step Probe
Tools Needed to Soil Test

- T-Handle
- T-Handle Step
Tools Needed to Soil Test

2. Plastic Bucket

The use of a plastic bucket is a place to collect the representative sample. Never use a metal bucket made from aluminum or zinc plated. This could cause metal leaching into soil sample.
How to Take the Soil Sample

- You are taking composite samples (many small subsamples) to create a large representative sample (roughly 1 pint)
- 5-10 samples for small areas such as flower beds
- 10-15 samples for larger areas such as lawns & garden
- Subsamples should be taken in a zigzag pattern at the same depth
- Samples should be taken to root depth
- 5-8” for trees, shrubs, flower beds, and veggie gardens
- 3-4” for lawns
How to Take the Soil Sample

Subsampling a Lawn with a Soil Probe

Organic Layer to be Rejected

Subsample to be Collected

Image: Joe Boggs OSU Extension
How to Take a Soil Sample
Preparation of Soil Sample Submission

Bring 2 cups of soil to April Buckeye ISA Family Event
**Submission Results**

**Turf and Ornamental Soil Analysis Report**

**PLANT LIFE LAWN CARE**  
**RR #1**  
**ATTICA, OH 44807**

**Sample Information**  
Sample: A1  
Lac Number: Y12345  
Sampled: 05-10-2008  
Tested: 05-11-2008

| Analysis       | Result | Optimal
|----------------|--------|--------
| Soil pH        | 5.6    | 6.0-6.5
| Buffer pH      | 6.6    | 7.0
| Organic Matter | 2.3    | 2.5-3.0
| CEC            | 7.4    | 7.0-8.0
| K Saturation   | 3.2    | 2.0-4.0
| Mg Saturation  | 13.8   | 10-20
| Ca Saturation  | 48.5   | 50-70
| Na Saturation  | 1.2    | 0-10
| K/Mg Ratio     | 0.3    | 0.5
| Phosphorus     | 34     | 50-100
| Potassium      | 100    | 150-220
| Magnesium      | 140    | 180-300
| Calcium        | 862    | 800-1500

**Very High**

**High**

**Good**

**Medium**

**Low**

**Recommendations**

Nutrients expressed in broadcast lb/1000 sqft. except Fe (foliar) and Mn (dow)

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>4.0-2.5-2.0</td>
</tr>
<tr>
<td>P</td>
<td>2.0-1.5-1.0</td>
</tr>
<tr>
<td>K</td>
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</tr>
<tr>
<td>Mg</td>
<td>0.2-0.1-0.1</td>
</tr>
<tr>
<td>S</td>
<td>0.1</td>
</tr>
<tr>
<td>Fe</td>
<td>0.02</td>
</tr>
<tr>
<td>Mn</td>
<td>0.02</td>
</tr>
</tbody>
</table>

**Bluegrass, Kentucky, Turf:** Where controlled release N is not used, split N applications six weeks (March-May-Sep). Monitor and adjust nutrient program with visual tissue analysis.

**Trees, Deciduous/Undeciduous:** 2 lb/1000 sq ft, within dripline in year 1. Split N 50% early spring and 50% late summer. Fertilized area under tree canopy 5 ft. from trunk, in 5 ft. outside of dripline. Adjust fertilizer rates based on annual leaf analysis.

**Flowers, Mixed Perennials:** Split N applications 25% each pre-emergence, plus 14 and 45 days post-emergence. Adjust fertilizer rates according to annual leaf analysis.

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Image: www.spectrumanalytics.com
Questions?