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## Soil Testing for Lawns

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Evaluating the nutrient status of your soil is an important step in developing a quality turf. The best way to find out what your soil needs to nourish healthy turf is to have it tested. Most soil testing labs recommend that you check the status of your soil every three to five years. You can obtain information, forms, and sampling bags at your local county Extension Office. The following should help you interpret your soil test results and provides guidelines to improving your soil's nutrient status.

### Taking a Soil Sample

- Contact your county Cooperative Extension office or soil testing lab for the fee structure, mailing containers, and other information.
- Using a small shovel or soil probe, sample to a 3-inch depth.
- Take approximately 10 to 15 samples per lawn and remove thatch and live plant material.
- Combine the samples to make one composite sample. Do not mix soils of different texture and color, from areas differing sharply in elevation, or from disturbed sites and undisturbed sites.
- Air dry the sample before sending.

### Soil Test Report

After processing your soil sample, the soil test lab will send you a soil test report. The following are usually included in the report:

#### Soil pH

A soil pH indicates whether the soil is acidic, alkaline, or neutral. The concentration of soil nutrients will vary depending on the soil pH.

#### Soil pH Below 6.0

If a soil pH is less than 6.0 (acidic), then a lime index is calculated to help make a more accurate lime recommendation. **DO NOT APPLY LIME UNLESS IT IS RECOM-**

**MENDED.** Most Indiana soils under turfgrass do not need liming. If lime is recommended, review the following guidelines before making the application.

- No more than 100 lb. of agricultural lime per 1,000 sq. ft. should be applied on higher cut turf.
- Ground agricultural limestone or ground agricultural Dolomitic limestone are the preferred forms of lime for use on all turfgrass areas. Applying lime after an aerification will increase the rate of pH change.
- Lime is very slow acting, so the pH will not change quickly.
- Lime does not replace a sound fertilization program.
- The area should be retested in three years to check for a change in the pH.
- Hydrated lime should not be used on lawns. The material could severely burn grass at high rates.

#### Soil pH from 6.0 to 7.5

It is unnecessary to adjust the pH. This is the optimum pH range for turfgrass growth.

#### Soil pH above 7.5

The only product recommended to reduce a high soil pH (alkaline) is sulfur. Unfortunately, the success of adding sulfur to lawns to reduce a soil pH has been limited and is not practical or economically feasible. To compensate for high pH, increase the annual application rate of nitrogen, phosphorus, and potassium by 25%.

#### Phosphorus (P)

The soil test results represent the amount of phosphorus available to the plants from the soil. Phosphorus deficiencies are rarely observed in established turf in Indiana, except on soils with very high pH. Table 1 is a guide for determining the desired rates of

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phosphorus application for established turf. When establishing or renovating an area, a phosphorus application will help establish seedlings. A fertilizer high in phosphorus (also called a “starter fertilizer”) should be used for this application and should be applied at 1.5 pounds  $P_2O_5$  /1000 ft<sup>2</sup>.

### Potassium (K)

The soil test results represent the amount of potassium that is available to the turfgrass plant. Potassium deficiencies are rare in turf in Indiana soils except possibly on coarse-textured, sandy soils. Muriate of potash (0-0-60) can be used to increase soil potassium levels. Muriate of potash can burn leaf blades, so apply in cool, dry weather and water the area soon after application. Table 2 is a guide for applying the proper amounts of potassium.

### Calcium (Ca) and Magnesium (Mg)

Calcium and magnesium are rarely deficient in Indiana soils when the pH is maintained above 6.0. Should a deficiency be noted, calcium and magnesium can be added as dolomitic limestone.

### Cation Exchange Capacity (CEC)

This number represents a measure of your soil’s capacity to hold nutrients. The higher the CEC, the more fertile the soil. It is used by the soil test laboratories in making certain nutrient recommendations for your lawn. The cation exchange number of an established lawn will not change significantly with time. In addition, it cannot be adjusted by adding fertilizer or chemicals.

### Nitrogen

There is no reliable soil test for nitrogen. Therefore, other factors should be considered in planning a nitrogen program. The nitrogen program is the key to a successful turfgrass fertility program. Refer to AY 22, Fertilizing Established Lawns, for more information.

Table 1. Recommended annual phosphorus ( $P_2O_5$ ) applications for established turf based on soil test results.

Soil test results level	Soil test results		lb. $P_2O_5$ / 1000ft <sup>2</sup> /year
	lb. P/acre	ppm P	
low	0-25	0-13	3 <sup>a</sup>
normal	26-50	13-25	2
high	51+	25+	1

<sup>a</sup>To increase the amount of phosphorus applied while maintaining the same amount of nitrogen applied, use a fertilizer high in phosphorus for the late fall application. The phosphorus (P) percentage should be larger than the nitrogen (N) and potassium (K) percentage. An example would be 5-10-5 or 17-23-6.

Table 2. Recommended annual potassium ( $K_2O$ ) applications based on soil test results.

Soil test results level	Soil test results		lb. $K_2O$ / 1000 ft <sup>2</sup> /year
	lb. K/acre	ppm K	
very low	0-50	0-25	6 <sup>a</sup>
low	51-100	25-50	4 <sup>b</sup>
normal	101-150	50-75	2 <sup>c</sup>
high	151-200	75-100	1 <sup>c</sup>
very high	200+	100+	0

<sup>a</sup>Apply 0-0-60 (muriate of potash) in the early spring and late fall at 2 lb. of fertilizer product per 1000 sq. ft. for two years in addition to planned nitrogen applications.

<sup>b</sup>Refer to the notes in (a) above. Only apply the muriate of potash for one year.

<sup>c</sup>Use a complete fertilizer containing nitrogen, phosphorus, and potassium twice per year.

**More information and mentioned publications are available at [www.agry.purdue.edu/turf](http://www.agry.purdue.edu/turf)**