



PEI Analytical Laboratories  
Soil Testing

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## The Why and How of Soil Testing

Over the past five decades, the practice and use of soil testing has become widely accepted in agri-business both by farmers and industry. The potential for increased yields and profits has been the obvious motivator for the keen interest in soil testing.

Fertilizers are the major cost in the production of most crops. Proper use of fertilizers will help to maximize marketable yields whereas excessive use may be harmful to the environment. A good soil testing program is a valuable tool in determining efficient and economic crop production on an individual field basis.

Limestone applications are also of particular importance on PEI's acidic soils. Soil testing is the best way to obtain a good estimate of the limestone applications required for a crop. Plant tissue testing can be another useful crop nutrient indicator; however it tends to be a "postmortem" type of test and is generally of more value in predicting the requirements of the next season's crop. Soil testing done in the spring or fall before a crop is to be grown, makes it the best indicator of fertilizer requirements for that crop season.

### Why Soil Test?

Soil testing is one of the best ways to assess land fertility. This assessment helps determine the amount and type of fertilizer and/or limestone that must be applied for maximum yield. Soil testing can help overcome such problems as:

- 1) Low yields due to lack of fertility
- 2) Acidic soils
- 3) Identification of appropriate fertilizer mixes
- 4) Excessive fertilizer application

Soil testing also allows for determining the micronutrient requirements of your crop. If you apply too little fertilizer, your crop yields and returns will be lower. If you apply too much fertilizer, you may be wasting unnecessary time and money, and there is an increased risk for environmental damage due to nutrient runoff. Soil testing can therefore provide a potential benefit to the farmer of increased yields, reduced operating costs and superior environmental risk management. Additional benefits include improved crop maturity and quality, higher tolerance to disease and pest damage, and increased crop growth.

### When to Sample?

Soil testing should be carried out regularly, and is usually recommended to be sampled once in a rotation. Soil samples may be taken at any time throughout the year, but there are advantages and disadvantages to the timing of the soil sampling.

Spring sampling provides the most current soil conditions and nutrient availability prior to planting, but may be inconvenient in terms of time commitment. Early fall sampling gives results in time for fall liming, but may also be inopportune as this may be timed too close to harvesting operations. Like early fall sampling, late fall sampling also assures that results are received in time to plan fertility for the next season's crop and are timed following harvest of the previous year's crop when time is not as limiting. A limitation to both fall sampling times is that the samples may not be as current as the spring sampling results, however, this may not be as much of an issue for some nutrients such as soil phosphorus or to a lesser degree, potash, as these nutrients are generally very immobile within the soil, and remain fairly consistent from fall to spring.

### What are the Tools Required?

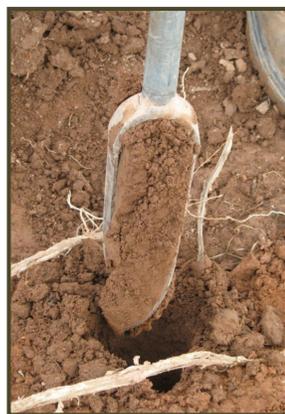
In taking a soil sample, be sure to get a good representation of the area. The tools needed include:

- i. soil probe/auger
- ii. bucket
- iii. soil bag

The soil probe is a good sampling tool, especially in sod fields. Soil probes are available on loan from the Lab (Figure 1). Soil augers (i.e. dutch augers) are also recommended as these can be easier to use for soil sampling in dry, compact soils, in comparison to the soil probe (Figure 2).



**Fig. 1** Soil probe



**Fig. 2** Soil auger (head)

### Where to take the Sample

A sample should be taken from an area that appears to have a uniform appearance across the whole section. Sections that should be sampled separately are:

- 1) Areas of high slope or excessive erosion
- 2) Large, poorly drained or low lying areas
- 3) Areas with different cropping patterns
- 4) Areas having different lime, manure or fertilizer treatments

Large fields should be divided into subsections no greater than 10 ha. (25 acres) and sampled separately.

### How to Take a Representative Sample

As there are slight differences even within uniform fields, take soil cores from 10-20 different places in the field. The depth to which the samples are taken is usually 15-20 cm (6-8 in.) or more if you are using deep tillage. If established forages are being sampled, the sampling depth should be between 10-15 cm. (4-6 in.). Thoroughly mix the cores in a bucket. Submit about 500 grams (1/2 pint) of soil for analysis. Sample bags are available from the Lab.

## Fill out the Information Sheet

In order to obtain fertilizer and lime recommendations, provide as much field history as possible. The more complete the history, the more accurate the recommendation.

### Select an Analysis Package:

#### Package S1:

pH, Organic Matter, P<sub>2</sub>O<sub>5</sub>,  
K<sub>2</sub>O, Ca, and Mg

#### Package S2:

pH, P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O, Ca, Mg,  
Cu, Zn, Fe, Mn, S, B, Na,  
Lime Index, CEC, % Base  
Saturation

#### Package S3:

pH, OM, P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O, Ca, Mg,  
Cu, Zn, Fe, Mn, S, B, Na,  
Lime Index, CEC, % Base  
Saturation

**Individual Tests:** Soluble Salt, NO<sub>3</sub>-N, Sample Preparation, pH(water & Buffer), Organic Matter

### Samples can be dropped off at:

P.E.I. Analytical Laboratories  
Soil Lab  
23 Innovation Way  
Charlottetown, PEI,  
C1E 0B7

Samples may also be left at your nearest Access PEI Office.

### When to Expect your Results?

Expect the results to be complete in four to five working days.

(Revised April 2014)