

# Small Scale Solutions for your Farm

## Soil Testing



### Do You Have Problems With:

- Nutrient deficiencies in crops
- Poor plant growth and response from applied fertilizers
- Hard to manage weeds
- Low crop yields
- Poor quality forages
- Irregular plant growth in your fields
- Managing manure or compost applications

### Purposes and Benefits of Soil Testing

- Determines nutrient levels in the soil.
- Determines pH levels (lime needs).
- Provides a decision-making tool to determine what nutrients to apply and how much.
- Potential for higher yielding crops.
- Potential for higher quality crops.
- More efficient fertilizer use.

### A Soil Test Tells You:

1. The pH level in your soil. This tells you if lime is needed.
2. Plant available phosphorus and potassium levels. This tells you if these levels are sufficient or if fertilizer is needed for crop needs and yield goals.
3. Magnesium and calcium levels in the soil.
4. If requested, the percentage of organic matter in the soil.
5. If requested (and depending on the soil testing lab) the soil test report will provide the recommended amounts of nitrogen, phosphorus, and potassium to apply in pounds per acre.

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Soil tests help to identify production problems related to nutrient deficiencies or imbalances. Above: Nitrogen deficiency in corn (photo: Ryan Stoffregen, Illinois).



Phosphorus deficiency in corn. Source: International Plant Nutrition Institute



Soil management is critical to your success.





## Collecting the Sample

1. Divide the sampling areas by field and areas less than 20 acres within a field.
2. Use a random zigzag pattern across the sampling field/acre.
3. Collect 15 to 20 individual samples at the required depth (usually 8 inches) to represent the “one” sample for the area and place the samples in the plastic pail.
  - a. If using a soil auger or soil core tool to collect samples: simply put all the sub-samples in the plastic pail.
  - b. If using a spade to collect samples: (1) remove a spade of soil to the desired depth and lay to the side, (2) remove a thin slice of soil to the desired depth and place in the plastic sample pail.
4. After collecting and placing the 15–20 sub-samples in the plastic pail.
  - a. Pour the entire amount into a plastic or paper grocery bag (if taking more than one soil test) — then continue taking the next field sample.
  - b. Take the sample from the grocery bag and pour it out on newspaper where it can air-dry (do not add heat and do not microwave).
  - c. When the soil is dry. Mix the entire sample then place the sample in the soil testing bag/box.
  - d. Complete the sample information form for sample identification, field history, and planned crops.



Soil sampling—Take 15–20 cores for one sample. Don't Guess—Soil Test.



Sample depth for pastures is 4 inches.

## How Often Should I Soil Test?

Generally, you should soil test every 3–5 years or more often if manure is applied or you are trying to make large nutrient or pH changes in the soil.

## When to Soil Test?

Sample fields the same time each year to achieve more accurate trends in the soil fertility.

- For cropland and vegetable production, it is best to sample in the fall of the year.
- For pastures and perennial crops, it is best to sample during the late summer period.



Sample depth for cropland is 6–8 inches.

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## How to Soil Test?

1. Find or select a soil testing lab.  
Your local NRCS office or Extension office can provide information on labs that are available in your area.
2. Tools Needed:
  - a. Clean plastic pail to collect soil samples.
  - b. Soil sampling tube, auger, or spade.
  - c. Large paper or plastic bag to hold 15–20 soil cores or sub-samples (grocery bags work well).
  - d. Sample bag/box from the soil test lab.
3. Sampling Depth:
  - a. For fields that are plowed or chisel plowed (8 inches deep).
  - b. For fields that are no-tilled consistently (8 inches deep for P and K and a sample 4 inches deep for pH).
  - c. Pasture fields are generally sampled to a depth of 4 inches.
4. Sampling Areas to Avoid:
  - a. Farm lanes and field borders
  - b. Fertilizer bands in crop rows
  - c. Any area that is very different

from the rest of the field: (severely eroded areas, sandy spots, wet areas).

## Associated Costs

Generally soil tests cost \$7 to \$10 per sample.

Soil tests cost vary depending on:

1. Your state (some states offer free soil testing)
2. The lab that is used.
3. The items being tested for (the cost increases as more nutrients are being analyzed).

NOTE: Some state agencies and land grant universities provide free soil testing for the basic soil test items (pH, available phosphorus, potassium, calcium, and magnesium, and organic matter). Additional costs may be charged for testing for micronutrients. In other states, all soil testing is done by private labs and generally charge \$7–\$10 for the basic test. One soil test should be taken for each field, or for each 20 acres within a field. See plot example).

## Technical and Financial Assistance

Whether you measure your farm in terms of feet or acres, your local Natural Resources Conservation Service (NRCS) office has experienced conservationists that can help you develop a Conservation Plan to conserve, maintain, and restore the natural resources on your land and improve the long-term health of your operation.

There is no charge for our assistance. Simply contact your local office to set up an appointment. You may also be eligible to receive financial assistance. Your NRCS office will explain any programs that are available so you can make the best decision for your operation. All NRCS programs and services are voluntary.

## For More Information

Visit the Natural Resources Conservation Service or visit [farmers.gov/service-locator](https://farmers.gov/service-locator) to find your local NRCS office. You can also check with your local USDA Service Center, then make an appointment to determine next steps for your conservation goals.

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