Soil Test For Profit

THE KEY TO MORE EFFICIENT FERTILIZATION

Why Test Soil

Information from soil tests that have been properly taken is your best guide to the profitable use of fertilizers. Fertilizer recommendations are based on the results of experimental work with fertilizers carried out over a period of years on a wide variety of soils throughout the state. The use of fertilizer recommendations based on a soil test makes it possible for you to develop a profitable fertilizer management program for your individual field and cropping conditions.

A soil test can measure:

- Fertility level in a soil - N, P, K
- Acidity or basicity - soil reaction
- Salinity - soluble salts

A soil test cannot:

- determine land values
- explain or correct poor yields due to weather conditions, soil borne diseases, insects, poor drainage, excessive drainage, poor physical conditions of soil, weeds, poor management

Tests Available on Your Soil Samples at NDSU

1. 0-6" samples can be tested for:
   - Phosphorus
   - Potassium
   - pH
   - Soluble salts*
   - Organic matter
   - Zinc
   - Iron

2. 0-6" plus 6-24" samples placed in separate containers can be tested for the above and for:
   - Nitrate-nitrogen

3. 0-24" samples can only be tested for:
   - Nitrate-nitrogen

*In order to get a clear understanding of the extent of a soluble salt problem, it is recommended that the soil be sampled by first taking a 0-6" sample and then continuing in one foot increments to a depth of at least 4½ feet.

How Often to Test

The phosphorus and potassium test rating of a field is not likely to change much until fertilizer phosphate and potash have been applied at recommended rates for three or four cropping years, thus tests for P and K are usually needed only once every three or four years.

Soil nitrate-nitrogen levels can change drastically from year to year and from field to field. As a result all fields should be tested for nitrate-nitrogen annually.

Soil organic matter levels change very slowly. Therefore, testing once every 5 years, should be often enough.

SAMPLING PROCEDURE

First - Discuss soil testing with your county agent or fertilizer dealer.

Time

Sample between September 1 and at least 2 weeks before planting for all tests involving nitrate-nitrogen.

Tests involving P and K or salinity sampling may be done any time.

Equipment Required for Sampling
An auger or a sampling tube and two clean pails are needed. A soil auger can be made from a 1" or 1½" wood auger equipped with an extension. Augers are particularly useful for sampling clay soils.

If you will be taking a large number of samples there are several types of power equipment on the market. In several areas of the state, custom soil samplers are available. Information on custom samplers or soil sampling equipment may be obtained from your county agent or the state soils specialist.

Soil sample cartons and information sheets also may be obtained at your local county agent’s office.

Size Up Your Field

Distinctly different soil conditions should not be mixed in the same sample, as such a mixture would not represent either area. Soil areas distinctly different in texture, slope, drainage, topsoil color or depth, productivity or past management should be sampled separately. (See examples)

This field contains almost equal parts of two different soil types. Each of the soil types should be sampled separately. This means that two sets of samples should be taken for this field.

There are two different soil types in this field, but the sand area is small and consequently all the sampling should be done in the clay area.

The eroded knolls and potholes are prominent features in this field but contain an insignificant amount of the total cultivated acreage. They should be ignored in the sampling. Sample only the normal soil areas.

There are small areas of saline soil in this field but they constitute only a small part of the total acreage. The field should be managed according to the dominant or normal soil and all the sampling should be done in the normal soil area.
A soil variation that makes up a fourth or less of a field area may have little significance as to the fertilizer treatment for the whole field. A separate sample need not be taken from such an area, but neither should any soil from the small area be mixed with the sample from the rest of the field. You may want to send in samples from small trouble spots. If you do, describe the conditions and sample them separately.

This “sizing-up” of the field before samples are taken is very important because the soil test results will be of little value unless a good sampling procedure is followed.

- Farm lanes and field borders
- Fertilizer bands in row crops
- Areas within 8 to 10 rods of gravel or dirt roads
- Any areas which are distinctly different from the dominant soil type in the field such as sandy ridges, potholes, eroded spots, small saline areas (unless these areas are sampled separately)
- Dead furrows and headlands
- Old manure piles or old straw stack bottoms
- Locations where brush piles have burned

Number of Places to Sample

The soil samples submitted from each area must be representative of that area. To obtain a representative set of two samples, from the 0-6 and 6-24 inch depth, randomly select at least 20 places in the area to be sampled, put the soil from the 0-6” depth in one pail and the 6-24” depth in a second pail. The more places sampled, the more representative the samples will be of that area. A sample representing only one or two places selected in an area is not representative of that field and will result in an erroneous recommendation. Research has demonstrated that once an area has been properly sized up that a minimum of 20 subsamples should be taken regardless of area size.

When taking samples from the 0-6” or 0-24” depths the same procedures as outlined is used with the exception that only one depth, either 0-6” or 0-24”, is needed and thus only one sample will be obtained from each area.

The information sheets and soil sample cartons should be completed as you finish sampling each area so that samples can be correctly identified.

Handling the Field Samples

After each field has been sampled, you will have one or two pails of soil; depending on test series. Mix the soil in each pail thoroughly and from each take a carton of soil and spread on a clean pan or piece of plastic and dry thoroughly as quickly as possible at room temperature. DO NOT DRY IN AN OVEN. Be careful that the samples do not become contaminated with foreign material such as commercial fertilizer, manure, salt, baking soda, water, dust, etc. A fan may be used to insure constant air flow over samples. Samples should be dry within 24 hours.

When the sample is thoroughly dry, fill one soil sample carton for each of the depths sampled.

Check the information sheets and corresponding information on soil sample boxes to make sure they are complete and prepare for shipping.

A money order or check in the amount necessary to cover current soil testing charges should accompany the information sheets for the samples you are sending. According to the postal rules the printed material should not be mailed in the package. Place the money and information sheets in an envelope and attach to the outside of the soil sample package.
STEPS TO GOOD SOIL TESTING:

1) See your county agent or fertilizer dealer
2) Select the equipment needed
3) Size up your field
4) Do the field sampling
5) Mix the sample thoroughly
6) Spread out to dry quickly
7) Package soil in carton and shipping box
8) Complete the information sheet and attach to shipping box
9) Forward samples, information sheets, check to:
    SOIL TESTING LABORATORY
    WALDRON HALL
    NORTH DAKOTA STATE UNIVERSITY
    FARGO, NORTH DAKOTA 58102
10) Discuss the results and recommendations with your county agent or fertilizer dealer when you receive them.

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