MINISTRY OF AGRICULTURE

SOIL SAMPLING

Soil sampling enable farmers to get accurate fertiliser and lime application rates, based on soil test results.

SOIL SAMPLING

1.0 Introduction

Farmers are investing time, labour, and money in their enterprises with the hope of getting marketable crops and profitable returns. Since most of the nutrients that plants require come from the soil, it is essential that the soil be able to supply these nutrients in the amount necessary for healthy plant growth. If farmers buy hybrid seed, fertilisers, and equipment without making sure that the fertility status of the soil is good, their efforts may be in vain.

It is always wise to investigate before you inves

The only way to determine the fertility status of the soil in a field is to analyse a sample of that particular field. The most common tests include determination of pH, exchangeable acidity and levels of available plant nutrients such as Phosphorus and Potassium (potash). These are available at no cost from the Soil Testing Unit at Malkerns Research Station and the other five satellite laboratories at Nhlangano Farmers Training Centre, Ngwemphisi RDA, Motshane RDA, kaLanga RDA and Northen RDA.

Soil test results indicate whether the soil is deficient, sufficient, or excessive in each plant nutrient. If the test results indicate that the soil does not have sufficient levels of nutrients, a corrective rate of fertiliser is recommended.

Soil pH results also show whether the soil is acid, neutral, or alkaline. Excessive acidity or alkalinity renders some nutrients to be unavailable to the plant and others toxic. If the soil is too acid, which is a common problem in the highveld of Eswatini, major elements become less available. Crops grown on acid soils will show nutrient deficiencies even if adequately fertilised. This problem can only be corrected by the addition of lime according to recommendations based on soil test.

The reliability of soil test results as a basis for determining the fertility status of the soil depends on how well that sample was taken. The soil sample should represent the field from which it was taken or else the results will be misleading. Recommendations based on incorrect soil sampling may be worse than no recommendations at all, because they will encourage the wrong action.

Equipment Needed for Soil Sampling

Before setting out to take soil samples it is very important to make sure that you have all the necessary equipment:

1. A plastic bucket: Do not use metal container.
2. Hand trowel or any tool that can be used to scoop the soil into the bucket.
3. Sampling bags
4. Pen
5. Label tags.

NOTE:

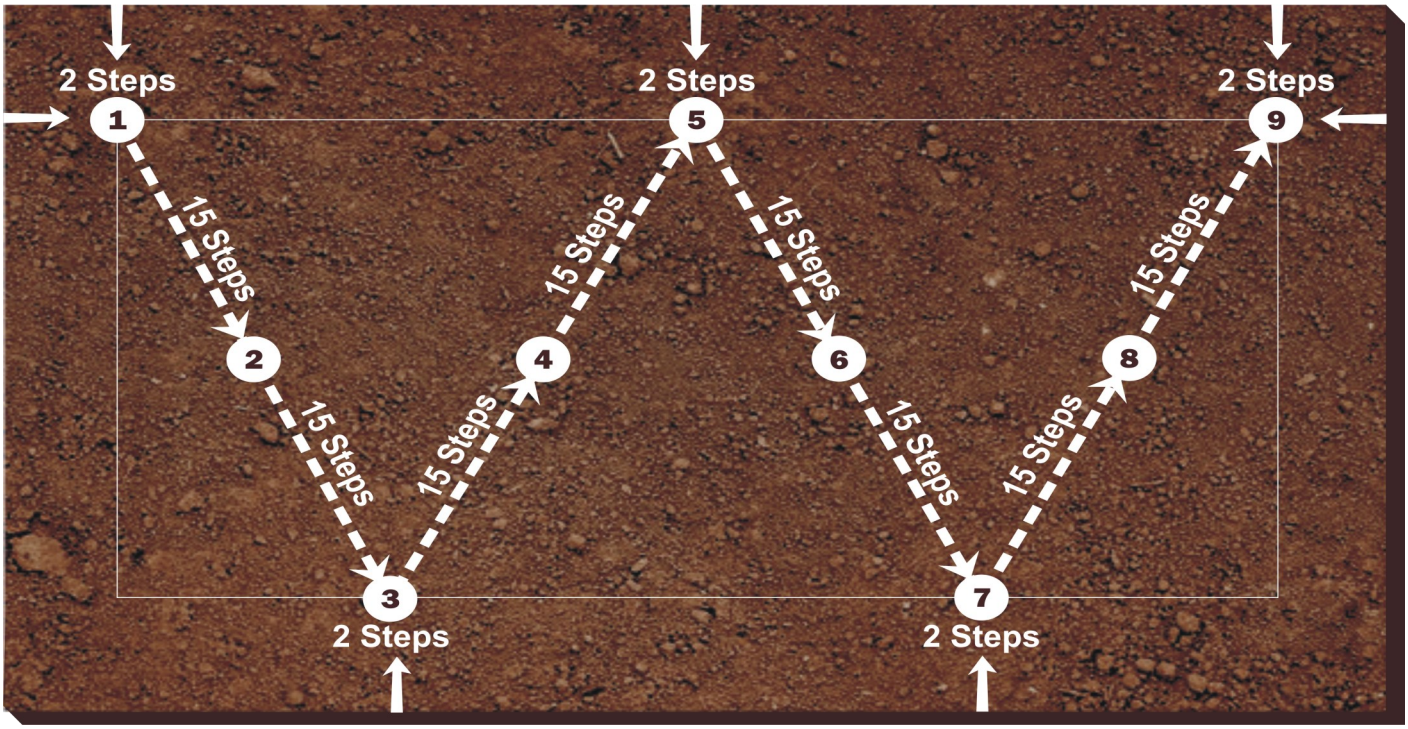
NOTE: If the sampling bags from the Soil Testing Unit are not available, other clean plastic bags may be used. All the required information should be clearly written on a separate piece of paper which may be tied outside the bag. Do not put the label tag inside the bag. Plastic bags that have been used for sugar, salt, fertilizer, or chemicals should not be used.

When to take Soil Samples

Soil samples can be taken at any time of the year but it is most convenient to both farmers and the laboratory to do it immediately after harvesting. Samples may be taken every year, so that changes in pH can be detected early, before they get extreme.

How to take Soil Samples

A simple procedure should be followed when taking soil samples. If the field is divided into panels, take a sample from each panel. The most important thing to remember is that each panel should be fairly represented by a soil sample taken from the entire length and width of the panel. This can be simply done by walking in a “W”.



1. Take samples every 15 paces along this path. Each place from which you take a sample is a sampling station

2. Before taking the soil from each sampling station, it may be necessary to move any rubbish or trash from the surface.

3. Take the soil sample from within 5-20cm of the top soil (root zone)

4. Scoop the same amount of soil into the bucket with the trowel
5. At the end of the panel, mix the soil in the bucket thoroughly and put about 2 cups full into the sampling bag.

6. Write clearly in ink all the necessary information on the label tag, giving the farmers name, Pin/ID number, Address, Community, crop to be grown, panel/Field number and filed size.

SOIL SAMPLE TAG INFORMATION

- NAME OF FARMER/GROUP:.....
- PIN:.....
- ADDRESS/CELL NO.:.....
- COMMUNITY/AREA:.....R.D.A.....
- CROP:.....
- FIELD NUMBER:.....
- FIELD SIZE (Ha.):.....
- SAMPLING DATE:.....

For multiple fields, it may be necessary to draw a diagram of all the fields. Each field on the diagram should be assigned an identifier (name, number or alphabet) and the same identifier should appear on the corresponding soil sample. This will make sure that soil test results are confused and a wrong remediation applied.

7. When taking a soil sample the following areas should be avoided:

- Field edges.
- Roadways.
- Fertiliser bands, usually in rows were crops planted
- Manure heaps.
- Ant hills.
- Near buildings or cattle byres.
- Eroded areas or waterways.
- Swamps etc.

8. Problem areas must be sampled separately.

NOTE:

1. For small vegetable plots where the “w” path cannot be practical, a fairly representative sample can obtained by scooping the same amount of soil from 15 places taken at random.

2. No less than three separate samples should be taken in large panels of ten hectares or more.

The samples should be submitted to the Soil Testing Unit at Malkerns Research Station or any of the 5 satellite labs mentioned , any of the 17 RDA, local Assistant Extension Officer, and Regional Agriculture offices as soon as possible.

The Soil Testing Unit can also collect the samples if arrangements are made by telephone (25274118). The report of the soil sample analysis can be sent to the farmer through the Assistant Extension Officer, RDA, and electronically. The report will include the Laboratory analysis of the sample, as well as recommendations for fertilisers and lime if necessary**.**

THERE IS NO CHARGE FOR THIS SERVICE

Soil Sampling for Non-Uniform Fields

A field may not respond uniformly to a recommended treatment. This may be caused by differences in soil pH, texture or depth in different parts of the field. In these cases the following should be done;

1. Draw a sketch of the entire panel in question.
2. Make close observation for soil texture and colour differences. Mark these areas clearly on a sketch map.
3. Make close observations of the crop during the growing stage. Note any differences in the growth of the crop during growing stage. Mark out these areas on the sketch map.
4. Separate soil samples from these different areas and at the same time you can also take leaf samples. Make sure each sample is clearly labeled as illustrared earlier.

Summary

A soil sample must be:

- Taken from every field or panel as pH can change dramatically over a very small area.
- Taken immediately after the previous crop, immediately after harvest
- Representative of the soil over the entire field
- Representative of the plough or root zone layer (from within 20cm of the top soil)
- Well labeled
- Delivered to the laboratory within the shortest time possible.

THIS INFORMATION IS AVAILABLE FROM ALL EXTENSION PERSONELL

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