

Soil Sampling and Processing

The main focus of this manual is to present an easy-to-use methodology for soil sampling and its analysis. To start the analysis proper knowledge of sampling is very much essential.

Soil Sampling

The process of obtaining soil for analysis i.e. soil sampling, is often ignored or poorly considered. A good sampling plan should provide a measure of the average fertility level of a field its variability. If a sample is not representative of the field or is incorrectly taken, the resulting analytical data would be meaningless, or at best, difficult to interpret. The error in field sampling is generally much greater than that of chemical analysis. Therefore, obtaining a representative soil sample from a field is the most important step for making a meaningful soil analysis.

A soil sample should be composed of several sub-samples representing a seemingly uniform area or field with similar cropping and management history. There is no universally accepted numbers of sub-samples for different field situations.

However, the following points can serve as guidelines:

A. Composite Sampling

Sampling areas are traversed in a *zig-zag* pattern to provide a uniform distribution of sampling sites. In general eight sub-samples are taken per hectare (ha) in a diagonal pattern for obtaining one composite sample or 5 to 25 borings or sub-samples per composite sample with sample units varying from 2 to 8 ha.

Fewer sub-samples are needed where little or no fertilizer has been used. Correspondingly, more sub-samples are needed where fertility is variable due to hand broadcasting of fertilizers and/or with cropping-livestock systems. Banding of fertilizer poses serious problems for reliable sampling. Thus the number of sub-samples taken should be realistic considering the particular field situation.

B. Time of Sampling

Soil samples can be taken any time if soil conditions permit. However, sampling after fertilization or amendment application should be avoided. It is important to collect the sample at regular intervals year after year for comparing analysis.

C. Depth of Sampling

For most purposes, soil sampling is done to a depth of about 20-cm. Depth wise soil samples can be taken where there is a concern to know sub soil nutrient status or for profile study.

D. Sampling Tools

There are two important requirements of a sampling: first, that a uniform slice should be taken from the surface to the depth of insertion of the tool and second that the same volume of soil should be obtained in each sub-sample.

Auger generally meets these requirements. In areas where the topsoil is dry, e.g., during summer, the topsoil sampling can be done by digging with spade. It is impossible to sample dry top soils with an auger. Soil samples for micronutrient analysis should be taken by using a stainless steel auger.

2. Processing

Soil samples must be put in plastic bags. After tagging and marking soil samples should be transported to the laboratory in cardboard boxes. All information about samples is recorded and each sample is given a laboratory number.

Samples are put in a freezer for minimizing microbial activity. Samples are air-dried at room temperature. Dried samples are cleaned off for stones and plant residues. Samples are ground in a stainless steel soil grinder and passed through a 2-mm sieve. Sieved soils are collected and stored in plastic bottles.