Soil, water and plant relationship

Soil sampling and preparation

Soil sample

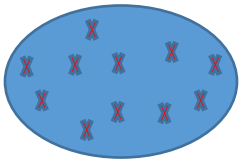
- *Is the **amount of soil that represents all or most properties of the field soil .***

The objectives of soil sampling and analyzing

- Determine the minerals and organic matter status of the soil.
- Classification of the soil.
- Determine the effect of (eco system) factors on soil development.
- Studying the soil fertility status.
- Studying the soil chemical properties (pH , EC , cat ions , anions ,---------- etc)

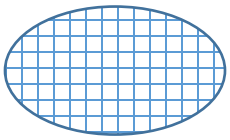
Methods of soil sampling

- ***Random method***; in this method we take the sample by using a square made of wood with (1 m^2) that thrown randomly in the field. It's a rapid method



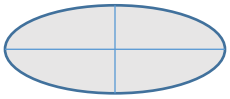
Random method

- ***Squares method***; dividing the field in both dimensions (length and width) equally then taking samples from crossing point. This method need time and effort, but covers the field homogenously.
- It is the best method of sampling because the sample represents the status of the soil in the field

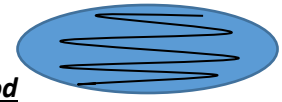


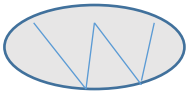
Squares method

- ***Divididing the field diametrically***; Then diving the diametric to equal space taking sample from the point



Divididing the field diametrically

- ***Zigzag method*** 

- ***W method*** 

Types of samples

- ***Single samples***
    - Usually it is collecting single samples and must be analyzed singly one after another.
- ***Composite sample***
    - This type of samples composed of several single samples which mixed thoroughly to form one mixed sample.
- ***Note all single samples should be equal in weight or volume***.

According to sample depths:

- ***Surface sample***
    - Usually it is collected from (30 cm) depth for chemical and biological analysis to evaluate soil fertility.
- ***Sub surface samples***
    - It is collected to classify the soil type and geneses and it is taken from (0-2 m)
- ***According to sample mixing:***
- ***Undisturbed samples***
    - It represents natural status from the field, without mixing. Usually taken for studying the physical properties of the soil (structure, permeability ….etc)
- ***Disturbed sample***
    - It represents the status of the field after (drying, mixing, sieving …….etc) usually it is used for chemical properties studding.

Points taken into consideration with sampling

- Uniformity of samples in weight or volume.
- Must avoid samples from.
    - Wet soils.
    - Near roads.
    - The storage of fertilizer in the field.
    - Top of hills or valleys.

Equipments of soil sampling

1-Auger

- Bucket auger: This type is the most suitable for medium soils.
- Dutch auger: effective on soils of high clay content.

- Jarrett auger: effective in gravelly soils.
- Screw auger: is used for disturbed sampling for fertility evaluation and rapid soil examination.
- Tube sampler: for rapid sampling of topsoil in medium textured soils.

- Blades, shovels, spades, knives, and core samplers.

2. Tubes and cylinders.

3. Hydraulic equipment.

Soil, water and plant relationship

How to Prepare the samples for analysis

- Mixing
- Partitioning
- Drying
- Grinding and sieving
- Storage.

Sample labeling

- ***Project name:-***
- ***Sample name:-***
- ***Location:-***
- ***Depth:-***
- ***Date:-***
- ***No. of samples:-***

Example

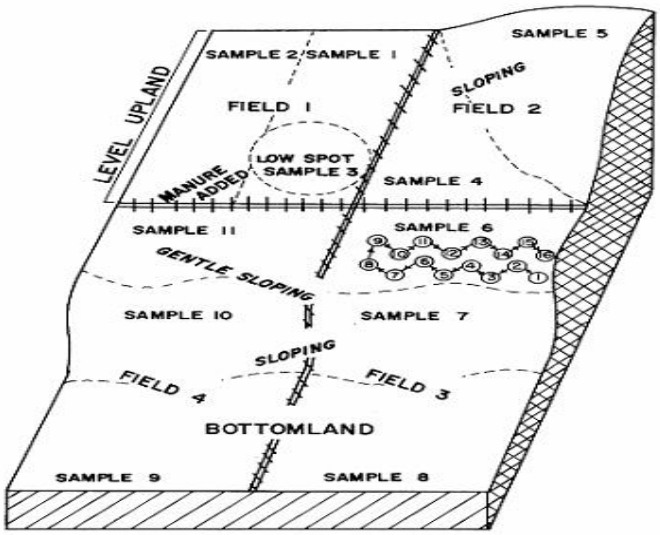


Figure 1. Sampling pattern for fertility test in a non-uniform land

(Sample numbers refer to composite samples) (Source: Tarzi, 1984)