



M.S.SWAMINATHAN
SCHOOL OF
AGRICULTURE

ASAC 1101 (2-1-0)

FUNDAMENTALS OF SOIL SCIENCE

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PRACTICAL MANUAL



Shaping Lives... Empowering Communities...

MSSSoA

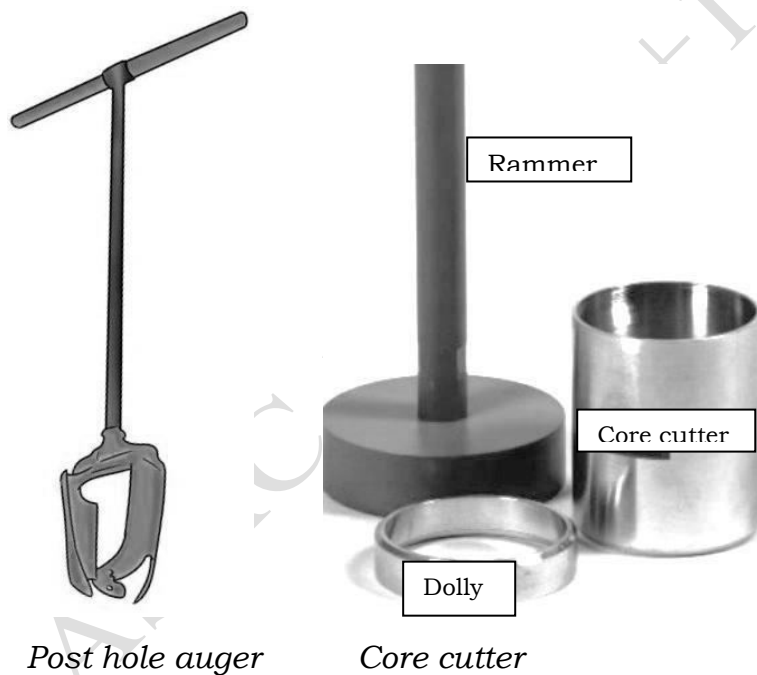
EX No.2

SOIL SAMPLING –TOOLS AND TECHNIQUES

- Aim:** 1.To know the method of soil sampling
2.To prepare the soil sample for analysis

Materials required:

1. Soil auger
2. Core sampler/cutter
3. Spade
4. Sieves – 2mm and 0.2mm
5. Shovel and khurpi
6. Sampling tray
7. Poly bags/jute bags
8. Marker/label
9. Dil. HCl (1:1)



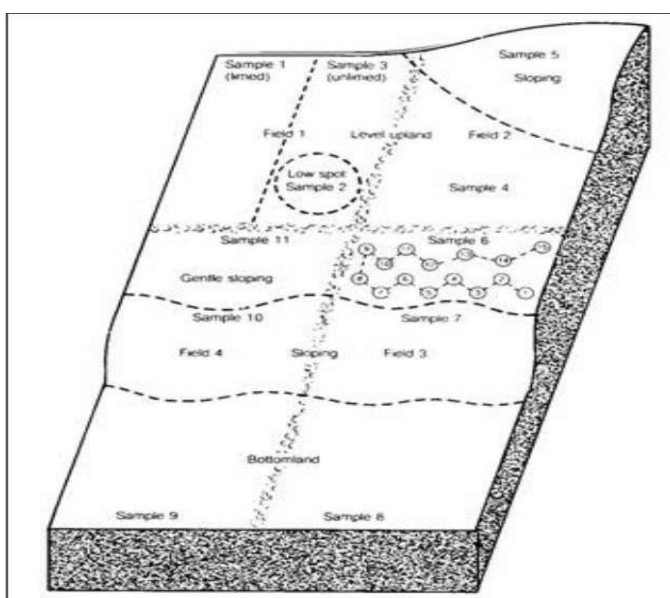
General purpose:

- * To find out the fertility status (soil physical properties and nutrients)
- * To recommend organic and chemical fertilizers
- * To select right crop in right soil
- * To reclaim soil (lime or gypsum application)

Procedure:

I. Delineating the soil sample unit :

1. The first step for soil sampling is defining the sample unit based on the variability i.e. slope.
2. History of the soil management followed by the farmer such as previous crop performance, cropping system, inclusion of legumes, amount and method of fertilizer use should be known.
3. Different composite soil sample should be taken from the different sample units.



Delineation based on slope and multistage sampling

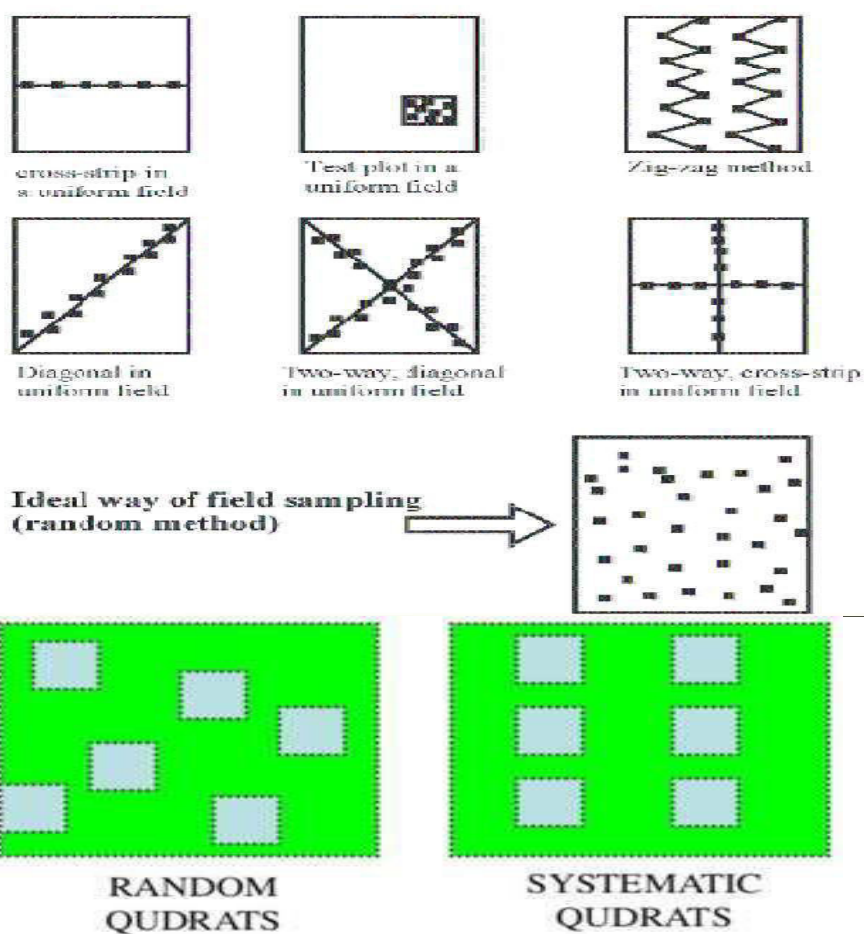
II. No. of Subsamples :

1. A soil sample (composite sample) should be composed of several subsamples.
2. In general, fewer soil samples are taken if no or little fertilizers have been used.
3. More subsamples are required where the fertility is variable due to broadcasting. Band placement of fertilizers poses a serious problem in soil sampling.

	No. of sub samples/ha
Cereal crops	8-10
Orchard/fruit crops	12-14

III. Sampling methods/Approaches:

- Zigzag pattern/Transversing
- Along the transect
- Diagonal in the uniform land
- Two way diagonal in uniform land
- Two way cross strip in uniform field
- Random sampling
- Random sampling within quadrates
- Systematic soil sampling within quadrates



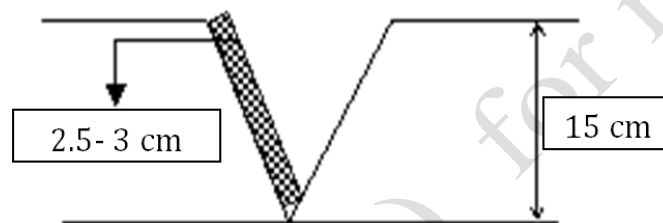
IV. Depth of sampling:

Crop root length determines the depth of soil sampling

Condition	Depth
Lawns or pasture crops	5 cm
Cereal crops	10-15 cm
Zero or minimum tillage	5-20 cm
Deep rooted crops E.g. cotton	35-45 cm
Fruit trees/orchards	100-120

V. Sampling technique:

1. Researchers use augers/ core sampler for soil sampling and farmers/ extension works use spade/shovels.
2. If spade is used, V shape pit (15-20 cm) is dug, and thin slice of the soil from slant cut is taken.
3. Before taking soil samples the surface weeds, stones or crop residues should be removed.
4. In fruit trees, depending upon the soil color and type, soil sample should be taken from 4 strata (0-30, 30-60, 60-90 & 90-120 cm).



VI. Preparation of soil sample:

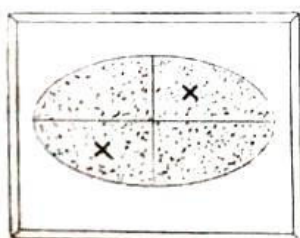
After arrival of the soil samples at the laboratory, it is dried in room temperature under shade (air drying), unwanted materials are removed, sieved to pass 2 mm sieve, assigned laboratory number and are stored until ready for analysis.

Composite sample/bulk soil

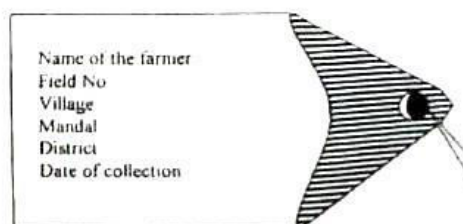
All collected sub samples are thoroughly mixed in sampling trays and clods, stones, glass, plant roots, debris etc. are removed.

Representative sample

The bulk of soil or composite sample is divided into 4 quarters and take 2 opposite quarters are bulked and opposite quarters discarded. Repeat thus process until 0.5- 1 kg of soil sample is left (quartering method).



Quartering method



Labelled paper tag



VII. Time of sampling and precautions:

1. In general, sampling is done during summer season i.e. April and May by Department of Agriculture.
2. Do not collect soil samples from recently fertilized fields and unusual areas such as old bunds, manure heaps, marshy spots, near trees, near wells, rock out crops and road sides.
3. It is important to take sample at similar time year after year for comparing analysis at regular time interval.
4. The time gap between one soil sampling to another (soil test gap) in general every three years interval.

Work done:
