1.5 SOIL SAMPLING

It is essential that soil samples are taken as accurately as possible in order to ensure that the soil analysis can be interpreted meaningfully. An analysis is only as good as the sample provided.

A soil sample is of little value without supporting information. The following information is required: name and postal address of farmer, farm name, field number, date, size of the field, cultivation practices, crop to be planted, previous crop and yield, previous fertilizer applications, any specific problems or conditions, planting date of perennial crop (in the case of trees or pasture), irrigation system where appropriate, previous liming practices, soil and rooting depth, nature of limiting soil layers, compacted layers, soil consistency (hardness), permeability (for water), soil structure, soil form/family, slope and aspect of the field, rainfall and other climatic details. Indicate whether it is a topsoil or subsoil sample, as well as the depth increment.

The different soil sampler augers are shown in Figure 1.5.1.

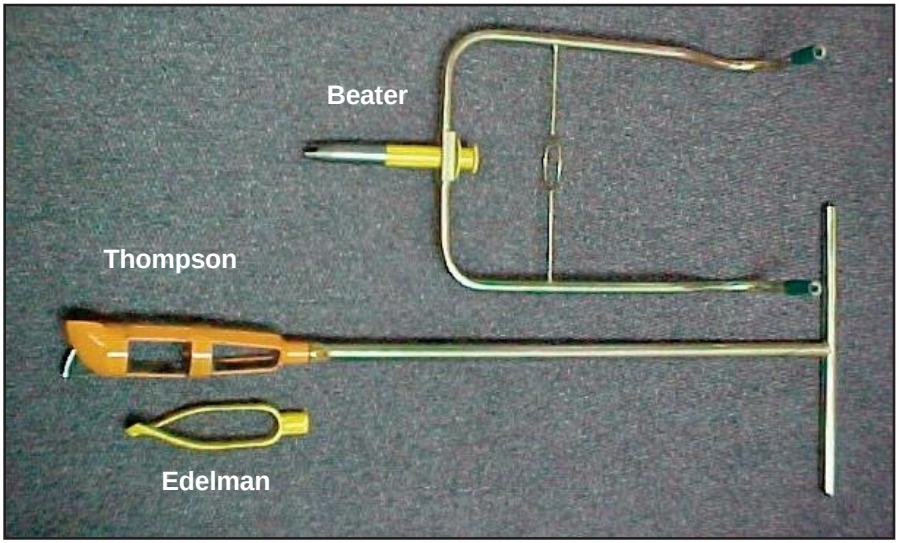

Figure 1.5.1. Beater, Thompson and Edelman type soil augers

METHOD OF SAMPLING

1. Divide fields into homogeneous units which are practical for crop production. For the purpose of soil sampling, units should not exceed 50 ha. In practice, depending on the analytical results; some of these units may be combined later. Assess the soil homogeneity according to the growth of the previous crop, soil depth, colour, topography and texture; number the fields.

2. Draw a map or sketch to indicate the location and aspect of the field units where the sample was taken (north, direction of slope, landmarks, roads, fences, gates, distances, field size, crop and field number).

3. Record all the required additional information mentioned above.

4. Remove all foreign materials such as grass, sticks and stones from the soil surface where an increment is to be taken. Do not scrape away the topsoil.

5. A representative topsoil sample (and under specific conditions also a subsoil sample) is taken on every selected field unit of not more than 50 ha. This is done by taking at least 20 increments[1] spread evenly over the unit area (regardless of size) using a suitable soil sampler. Topsoil samples are usually taken to a depth of 20 cm, but may be taken to a depth of 30 cm depending on the tillage method. Subsoil samples are taken at a depth of 20 to 40cm and 40 to 60cm or 30 to 60 cm as required; 4 to 5 increments per representative sample are adequate. If a crop is still standing on the field, take samples randomly between the rows, but no closer than 15 cm from the row. Indicate if the crop is still on the field. In permanent tree orchards it is useful to mark specific trees for annual follow-up sampling. To avoid confusion it is advisable to mark soil samples as follows:

Field name:	……
Field number:	……
Topsoil:	0 - 20
Subsoil:	20 - 30 x
Subsoil:	30 - 60 xx

[1] *An increment is a small amount of soil taken from a single specific arable field unit. When put together, increments make up a composite or representative sample.*

6. Place the 20 or more increments on a clean bag (not a fertilizer bag); break up all clods; remove stones and foreign material that might be present; mix thoroughly and spread out in a thin layer over the bag; scoop small amounts of the soil evenly from the surface to the full depth of the soil layer and place in a clean container or plastic bag. Collect approximately 1 kg of soil to make a representative sample; mark and number the bag. Avoid using second hand bags which may be contaminated with fertilizer, bicarbonate of soda, lime or cream of tartar.

7. Recent research has shown that considerable spatial variation occurs with band placement of fertilizers, especially when combined with fixed tillage practices, such as controlled traffic. Consideration should be given to possible implications of spatial variation when sampling and in the interpretation of analysis.

PRECISION SOIL SAMPLING

Refer to Chapter 6, page 463 for soil sampling in precision farming.

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