

Guidelines for preparing soil samples for the central laboratory

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Introduction

- 1 At the 3rd Joint BioSoil Soil Biodiversity Meeting on 28-29 November 2006 in Ispra, FSCC was asked to set up guidelines on how to prepare the subsamples for the central laboratory.
- 2 At the Kick-off meeting on 16-17 June 2005, it was agreed that:
 - All countries will send samples which are dried and sieved (< 2 mm fraction) (for details see Soil Manual IIIa SA01 Pre-treatment of samples) so they will be ready for storage.
 - The central laboratory will receive one organic layer samples (F+H layer) and four mineral layer samples (0 – 10 cm, 10 – 20 cm, 20 – 40 cm and 40 – 80 cm)
 - The size of the samples is 50 g for the organic layer and 100 g for the mineral layers.
- 3 To work more efficiently, all samples (both archived and new samples) should be sent at the same time.

To be consistent with previous harmonisation efforts, the following guidelines are based on the ISO standard ISO 11464:1994(E) on pre-treatment of samples for physico-chemical analysis.

Homogenisation

When subsampling a homogenisation step is always required to guarantee that all subsamples have the same composition and properties. This can be done manually (stirring) or mechanically.

Subdividing the sample: subsampling

For the preparation of a test sample, split up the laboratory sample into representative portions until the required sizes of samples are obtained. Avoid the production of dust as much as possible.

Select the method of subsampling according to the nature of the sample, the requirements of the subsequent determinations and the equipment available.

Subsampling by hand (quartering)

Mix the soil sample thoroughly and spread it into a thin layer on a tray of a type which will not influence the composition of the sample. Separate the soil into four equal portions (quadrants). Combine two of the four portions diagonally, rejecting the other two. Repeat this procedure until the desired amount of soil is obtained (see Figure 1).

Assuming that about 800 g of dried sample is available, the sample can be reduced by 2 quartering steps. A third quartering step results then in 2 subsamples of 100 g each.

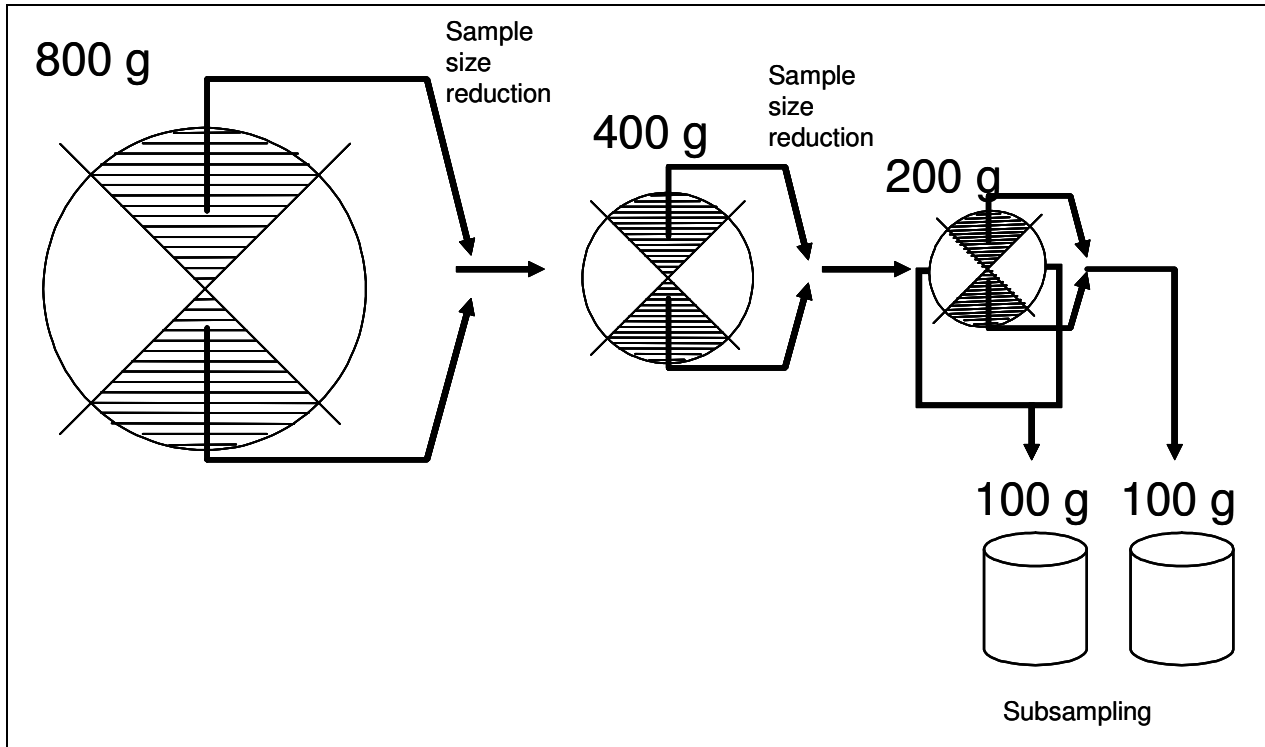


Figure 1: Subsampling by hand (quartering)

Use of a sample divider, splitter or riffle box of the ‘multiple slot’ type

A suitable example of a sample divider of the multiple-slot type (riffle box) is shown in Figure 2. This splits the sample into two equal parts. The dimensions of the equipment should be chosen in such a way as to suit the amount and particle size of the materials to be divided (see Table 1 and Figure 2):

Table 1: Dimensions of a mechanical sample divider. All dimensions, except A, are approximately only.

Max. size of sample	N° of slots	Internal dimensions			Internal dimensions of the boxes (3 required)		
		A mm	B mm	C mm	D mm	E mm	F mm
mm		A mm	B mm	C mm	D mm	E mm	F mm
10	12	15	80	30	120	90	200
5	12	7	20	15	50	50	90
2	12	5	20	15	50	50	90

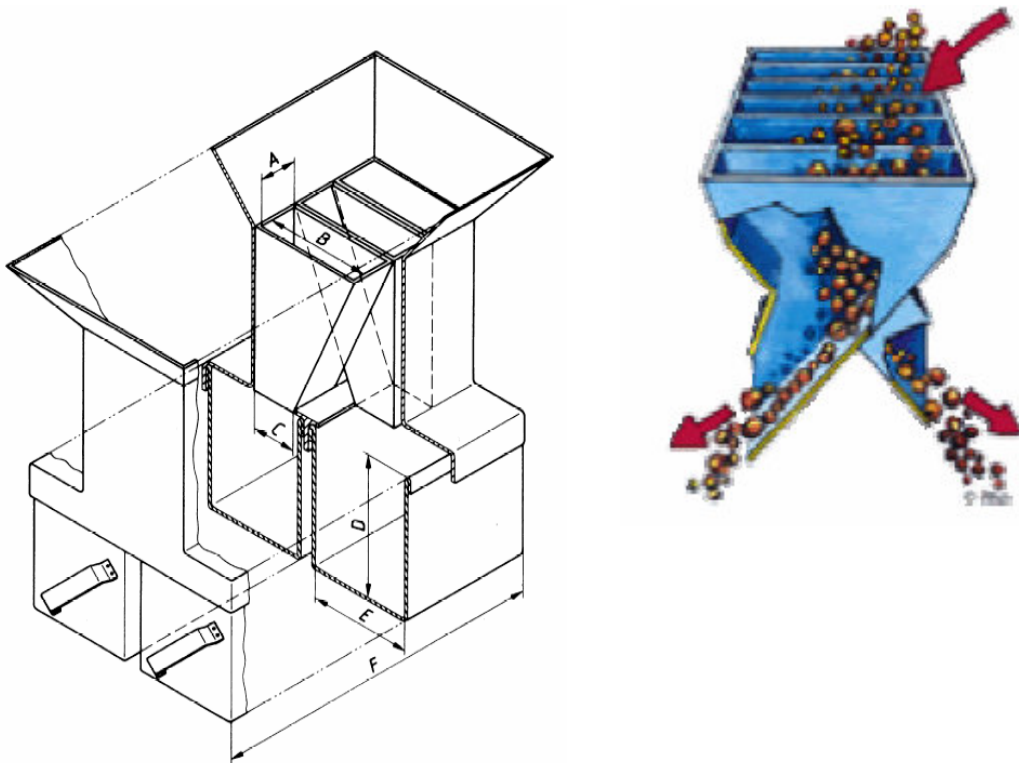


Figure 2: Example of mechanical sample dividers of the 'multiple slot' type (riffle box).

Mechanical subsampler

A variety of appropriate equipment for subsampling is available, often manufactured according to national standards. These may be used for subsampling in accordance with the appropriate national standard and the manufacturer's instructions.

An example of mechanical subsampling equipment is illustrated in Figure 3. This operates according to the following procedure.

Pour the soil sample into the funnel of the subsampler (Figure 3) and screw the sample bottles into place. Start the subsampler. After subsampling, pour the contents of the bottles into other sample containers. Repeat this procedure, if necessary, with the contents of one of the containers until the desired amount of soil is obtained. The material should be rehomogenized between each stage of subsampling. The contents of more than one container may be thoroughly mixed and used for subsequent phases of the subsampling routine.

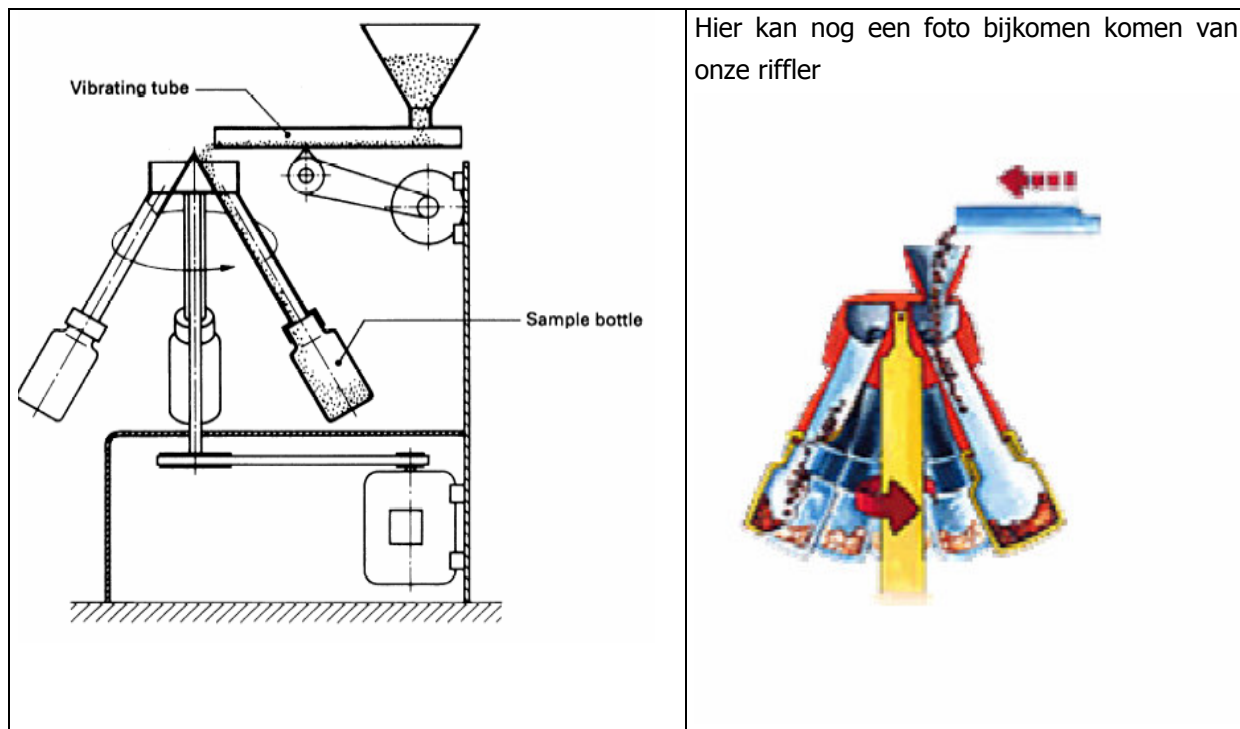


Figure 3: Example of a mechanical subsampler

References

ISO (1994) ISO 11464:1994(E) Soil quality: Pre-treatment of samples for physico-chemical analyses. 9 pp.