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ANALYSIS OF FERTILIZER SAMPLES

(This Circular cancels Advisory Circular No. F6, Serial No. 6/92, issued in August 1992)

1. Introduction

The Institute undertakes analysis of fertilizer samples to determine their nutrient contents for ensuring quality. The values so obtained may differ from those expected of their chemical composition for the following reasons:

1. Adulteration
2. Presence of excess moisture. Straight fertilizers or fertilizer mixtures which are hygroscopic or contain hygroscopic components, could absorb moisture and become a slurry, if stored under humid conditions
3. Inadequate mixing of the components of a fertilizer mixture
4. Segregation of particles of different sizes in the bag containing the mixture during transport and storage
5. Presence of impurities
6. Incorrect sampling procedure
7. Analytical errors. This is relatively small

For the results of analysis to be meaningful, it is necessary that great care be taken when sampling is carried out. It is only then the samples would be representative of the bulk of the fertilizer or fertilizer-mixture sampled. Thus, it is important that the following procedure be strictly adhered to in sampling.

2. Sampling

The number of fertilizer bags to be collected at random for sampling should be determined based on the amount of fertilizer bags in a given store as per Table 1.

Table 1. Guide to determine the number of bags to be sampled

Stock of fertilizer	Percentage of the minimum number of bags taken for sampling	Number of bags
Less than 2 bags	100	sample both bags
2-5 bags	60	2
6-10 bags	40	3
11-20 bags	20	3
21-60 bags	5	2
61-200 bags	4	3
201-500 bags	3	8
501-1000 bags	2	13
1001 or more bags	1	20

The accepted procedure for obtaining a representative sample of fertilizer is described below.

3. Methods of sampling

3.1 Use of a shovel

The bags to be sampled should be selected at random and should be emptied separately on a clean dry surface and blended using a shovel and one shovelful taken from each. The shovelfuls so taken should be then thoroughly mixed and any lumps broken up. From this mixture, a sub sample should be drawn by the process of quartering.

3.2 Use of a sampling probe

1. Use a sampling probe (details given below) to draw samples from fertilizer bags
2. Lay bags horizontally, open one end and pass the probe diagonally from one end to the other and remove the core
3. From lots of ten bags, take one core from each bag
4. For lots of more than ten bags, select ten bags at random and then take one core from each bag
5. When it is necessary to sample only lots of less than ten bags, take ten cores but at least one core from each of the bags
6. For bulk fertilizer, draw at least ten cores from different points
7. From this, subsamples should be drawn by the process of quartering as described below

The sampling probe could be constructed by taking 0.9 m (3 feet) long 5 cm (2 inches) internal diameter conduit piping or PVC tubing. Cut one end of the tubing obliquely to get a sharp pointed edge (Figure 1).



Figure 1. A diagrammatic sketch of a sampling probe (a) and a shovel (b)

4. Subsampling by the process of quartering

It is required to reduce the quantity of fertilizer to a manageable size prior to submission for analysis. Therefore quartering should be adopted as explained below to subsample the collected fertilizer (Figure 2).

- a. Heap the fertilizer to form a 'cone' on a clean sheet of paper or polythene
- b. Flatten the cone and divide into two sections through the centre with a metal spatula or wooden plank
- c. Divide each half once more and separate the four quarters into four separate piles or quarters
- d. Reject one set of diagonally opposite quarters and mix the remainder
- e. Continue the quartering and rejection until the desired quantity of sub sample is obtained
- f. Collect the final remainder as representative sub sample

One kilogram of sub sample is quite sufficient, of which only one-third need be sent for nutrient analysis, one-third should be sent to the supplier and the balance must be retained by the customer.

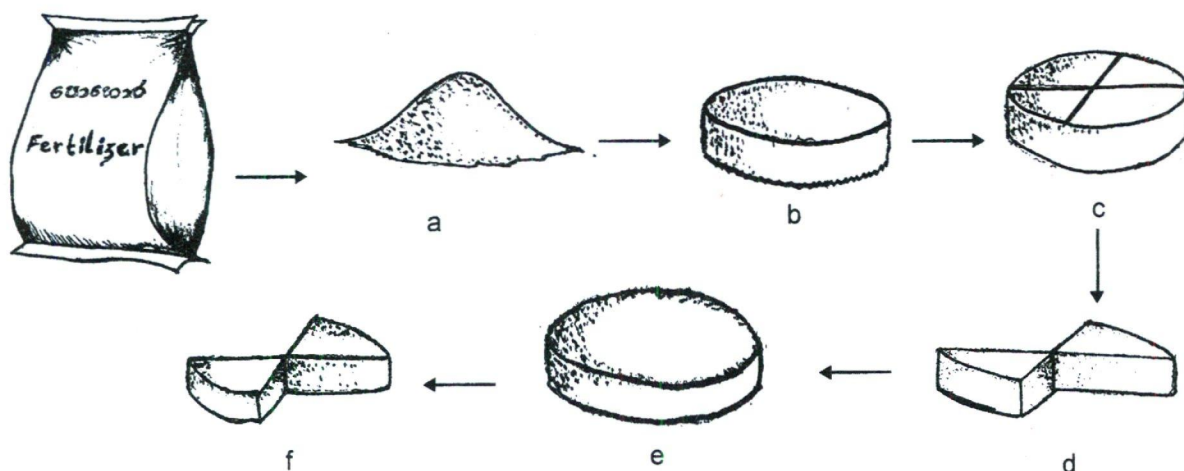


Figure 2. Subsampling by quartering

5. Labelling

The samples should be carefully and correctly labelled giving the name of the estate, type of fertilizer and the date on which the samples was taken. It must be ensured that the label does not come into contact with the fertilizer sample. This precaution is taken to avoid the labels becoming illegible at the time of arrival at the TRI laboratories or its centres.

6. Sample despatch

The samples should be sent directly to the Head, Soils and Plant Nutrition Division, Tea Research Institute of Sri Lanka, Talawakelle or to the regional laboratories located at following addresses depending on convenience for transport.

- Soils and Plant Nutrition Laboratory, Walahanduwa, Galle
- Soils and Plant Nutrition Laboratory, Research, Advisory and Extension Centre, PO Box, 130, Hantana, Kandy

It is necessary that the total cost of analysis should be paid prior to commencing analysis. Payments could be made through cheques, postal or money orders drawn in favour of "Tea Research Institute of Sri Lanka" and forward to the Head, Soils and Plant Nutrition Division, Tea Research Institute of Sri Lanka, Talawakelle or to the regional laboratories at Hantana, Kandy and Walahanduwa, Galle. Money could also be paid at the cash counter of the Tea Research Institute or its centres at the time of submission of samples for analysis.

The analysis is being done on the strict understanding that neither the Tea Research Board nor the Tea Research Institute of Sri Lanka will be involved in any litigation, nor will any officers employed by the above Board or any of its Divisions or its centres be required to answer summons to witness in any legal action or dispute arising from the results of this or any other analysis of these or similar samples.

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