

- **Sustainable Land Management Project (SLMP)**

Project Development Objective

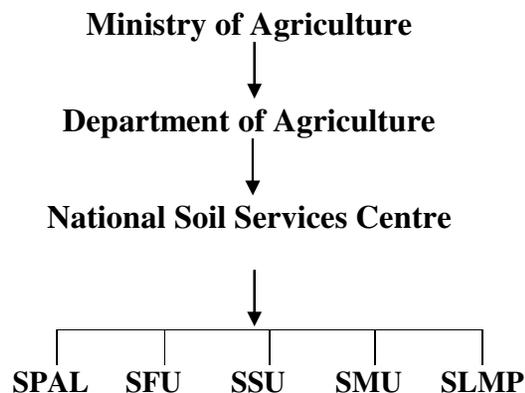
- To strengthen institutional and community capacity for anticipating and managing land degradation in Bhutan

Global Environment Objective

- To protect trans-boundary watersheds in a manner that preserves the integrity of ecosystems in Bhutan

Guiding principles

- Bottom-up planning approach- community priorities and community decisions
- Phased implementation- initially in 3 pilot geogs, extending to other geogs as SLM capacity is built
- Support to decentralisation
- Ensuring an appropriate knowledge and information base to guide SLM decision making on practices, planning and policies
- Integrated multi-sectoral approach- a strategy for improving the management of natural resources
- Stakeholder consultation-throughout the project.



Different units under NSSC

- **Soil and Plant Analytical Laboratory (SPAL)**

Conducts analytical tests on:

- ☞ Soil
- ☞ Plant
- ☞ Animal feed
- ☞ Manure
- ☞ Water
- ☞ Pesticide residue analysis

For research, extension and any other land and environmental related issues.

- **Soil Fertility Unit (SFU)**

Work directly with farmers & extension on:

- ☞ Farmer Extension Fertilizer Use Trials (FEFUT)
- ☞ Farmer-extension training

- To refine/develop fertilizer recommendations for major crops (cereals and fruits/vegetables)

- To study the soil fertility trend of the major traditional farming systems.

- **Soil Survey Unit (SSU)**

- ☞ Carry out soil survey of prioritized areas which is mostly client driven
- ☞ Produce soil reports and digitized soil maps
- ☞ Do land evaluation/suitability evaluation for specific crop and produce suitability maps where ever feasible
- ☞ Participate in land swapping activities in collaboration with LUSS
- ☞ Collecting soil monoliths and determining AHC
- ☞ Compiling base maps for soil surveys

- **Soil Microbiology Unit (SMU)**

Responsible for

- ☞ Inoculum production
- ☞ EM solution production
- ☞ Study soil biodiversity under different land use.



Ministry of Agriculture
Department of Agriculture
National Soil Services centre



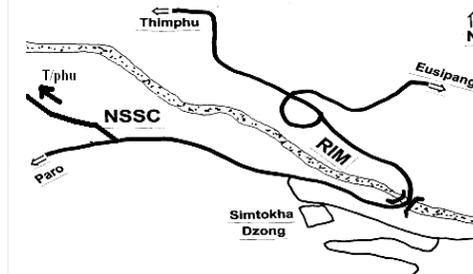
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HORTI-CULTURAL CROPS SOIL SAMPLING

Leaflet No. 3



NSSC Complex at Semtokha



Location

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Guide to soil sampling for Horticultural tree crops

Soil testing is to evaluate the fertility status of the soil. It provides a basis for the recommendation of fertilizer and soil amendments such as gypsum (for alkaline soils) and lime (for acidic soils). It helps in determining the nutrient need of the plant before the crop is planted. In an old orchard, soil testing provides additional information on fertilization programmes while in the new orchards it provides best means for determining the type and amount of nutrients required.

1. Materials required.

- ☞ Soil augur/ long narrow bladed shovel or any ordinary shovel/trowel/ spade
- ☞ Measuring tape for taking desired depth
- ☞ A tray or pail to collecting and mixing the soil
- ☞ Plastic bags and rubber bands for packing the sample
- ☞ Paper and pen to label the soil samples
- ☞ Soil analysis request form

2. Soil sampling procedure

- ☞ Divide the field into at least 8-10 parts in random for an area of not more than 1 ha.
- ☞ Scrape away grass or any plant residues from the soil surface

- ☞ Take soil sample with the help of augur to a depth of 20cm (top soil) and place it in the tray. For the subsoil sample, augur another depth of soil of 20-40 cm depth (sub soil sample) from the same pit/hole and place it in another tray.

- ☞ For soil sampling, follow the tree canopy
- ☞ Similarly, take samples from 8-10 more points (both top and subsoil) and place them in their respective trays
- ☞ Mix all the samples thoroughly, break all the soil lumps, and remove any plant roots and stones in the tray. Place about a kilo of soil into the plastic bag and label it properly.
- ☞ Attach to the sample a filled soil analysis request form (soil information sheet)
- ☞ Send this ready sample to SPAL for analysis

3. Sampling time

- ☞ Samples are usually taken either before cultivation or after harvest and before application of any fertilizers.

4. Helpful hints in taking soil sample

- ☞ Each soil sample should represent only one soil type or only one soil condition
- ☞ Avoid taking samples at the borderline of two different soils
- ☞ A good sample should represent the area
- ☞ Take adequate samples of the area (8-10 sub samples)
- ☞ Don't take samples from fertilizer bands
- ☞ Small unusual area should be avoided
- ☞ Take soil samples to the correct depth
- ☞ Two samples are taken separately, viz. topsoil and subsoil samples (0-20 cm and 20-40cm respectively), for horticultural tree crops.
- ☞ Take samples from different tree age groups separately (eg. bearing and non bearing trees)

If orchard on a sloppy area, divide the sampling areas horizontally and not vertically (e.g if on a terrace, take samples from different terraces separately)

- ☞ **Avoid contamination of the samples**
- ☞ Use clean sampling tools
- ☞ A small amount of fertilizer residual on the tools or hands can cause serious contamination of the soil samples.

5. The importance of careful sampling:-

The reliability of the results and the recommendations from analysis depends, ultimately, on the accuracy of the very first step – **Sampling!**

- ☞ Sampling can be considered in terms of three simple stages:
 - ❖ Taking a representative sample of soil,
 - ❖ Supplying all necessary field and background information (particularly for problem areas),
 - ❖ Correct packing and immediate dispatch to the laboratory.