

Soil-Test-Based Fertiliser Application

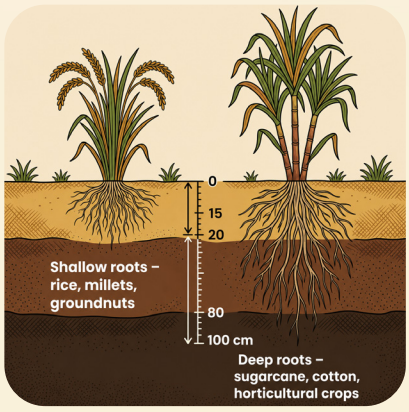
Soil is an important source of nutrients for the growth and development of crops. Therefore, maintaining soil health to sustain and enhance crop productivity is crucial. Excessive use of fertilisers without understanding soil health can lead to its deterioration. Soil testing can help identify what the soil lacks and what it holds in excess. Applying the recommended dose of fertilisers based on soil tests can help improve soil fertility, nutrient-use efficiency, and ultimately crop productivity.

Soil sampling



Sampling time

Preferably before sowing of the crop, when the field is dry



Sampling depth

Between **0 and 15–20 cm** for field crops having shallow roots, such as rice, millets, and groundnuts, and **80–100 cm** for deep-rooted crops such as sugarcane, cotton, and horticultural and plantation crops



Materials required

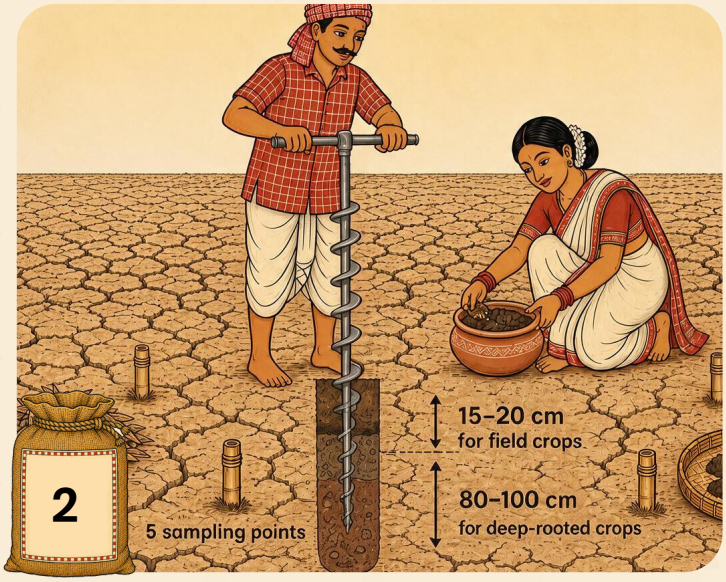
Spade or auger, *Khurpi*, sampling bag, plastic tray or bucket, marker, scale, paper, and pen

Step-by-step guide



Divide the field into homogeneous units (four quarters). Collect samples from the four corners of the field and one from the centre (these are your sampling units).

Remove surface litter from the sampling units.



Drive an auger into the soil for field crops (15–20 cm) and deep-rooted crops (80–100 cm) to draw the soil sample.

Collect up to five samples from each sampling unit and place them in a bucket or tray.



If an auger is not available, use a spade to make a V-shaped cut to a depth of 15 cm in the sampling unit.



Remove thick slices of soil from the top to the bottom of the V-shaped cut and place in a clean container.



Mix the soil samples collected from all sampling units thoroughly. Remove debris such as pebbles, leaves, and roots.



Divide the mixed sample into four equal parts.



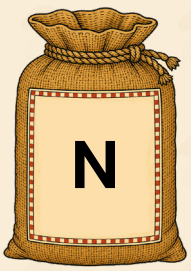
Of the four, discard two opposing parts, and mix the remaining two quarters. Repeat this process until the desired sample size (250–500 g) is obtained.



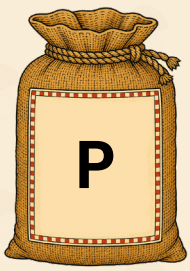
- Collect the sample in a clean polythene bag, preferably one that can be made airtight. Make sure the soil is air-dried before packing.
- Label the bag with the following information: farmer name, farm location, survey number, previous crop grown, crop to be grown in the next season, collection date, name of the sampler if different from the farmer, etc.

Key nutrients measured

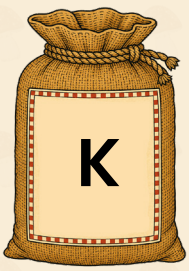
Macronutrients:



Nitrogen
Essential for leaf growth and plant metabolism



Phosphorus
Improves root growth and development and flower and fruit formation.



Potassium
Enhances disease resistance; regulates water use and photosynthesis

Micronutrients: **Iron, zinc, manganese, copper, boron, molybdenum, and chlorine.** These are required in small amounts but are vital for healthy plant growth.

Organic matter: Enhances soil structure, water retention, and nutrient availability.

Soil pH: Soil acidity and alkalinity affect nutrient availability.

Benefits

Improves soil health



Soil testing helps farmers to use recommended doses of nutrients and fertilisers, which improves soil health to ensure better crop growth and development.

Better nutrient management



Soil testing helps farmers identify the soil's nutrient content.

Improvement in crop quality and yield



By identifying nutrient deficiencies, soil testing assists in adjusting nutrient levels in soil, thereby enhancing crop productivity and quality.

Protection of environment



Helps in preventing soil and water pollution through efficient use of fertilisers and chemicals.

Reduction in cultivation cost



Soil testing helps optimise the application of fertilisers, reducing unnecessary expenses.
Reduced greenhouse or global warming gases, such as nitrous oxide.

Where to get soil tested

- **Soil testing labs of the district agriculture departments**
- **Krishi vigyan kendras**
- **Labs under the Soil Health Card scheme**

**AI tools were used to optimise images.*