



Soil Sampling

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Why & How?

The Fertilizer Association of Ireland
In association with Teagasc



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Soil sampling is the most important stage in managing soil fertility. Soil test results are a reliable guide to assessing and monitoring soil nutrient levels. Taking good soil samples will lay the building blocks to formulating good nutrient advice. Soil sample results provide a sound basis for lime, manure and fertiliser application.





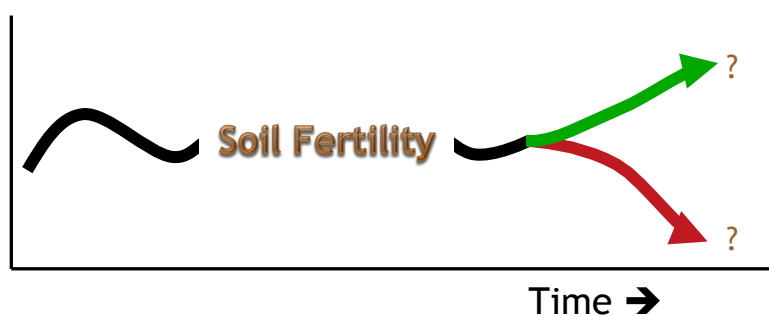
Testing soil nutrient levels

A typical standard soil analysis will test major soil nutrients such as soil P, K & Mg.

Soil acidity is determined by measuring the soil pH which will generally range from soil pH 5 to 8. The soils lime requirement (LR) is determined by measuring the soils buffer pH. A range of trace elements analysis is available depending on the crop for example Boron (B), Cobalt (Co), Copper (Cu), Available & Total Manganese (Mn) and Zinc (Zn).

Monitoring Soil Fertility levels

Regular soil sampling provides up to date field by field information. This provides an opportunity to monitor farm soil fertility changes over time. This is very valuable information for the efficient and more targeted application of lime / organic manures / fertilisers based on soil fertility trends over time. This is vital information as it shows the speed of change in soil pH, P & K relative to nutrient management practices for the soils and fields within a farm.



“Key steps to taking Soil analysis must be observed in order to ensure that samples accurately represent the area being sampled”

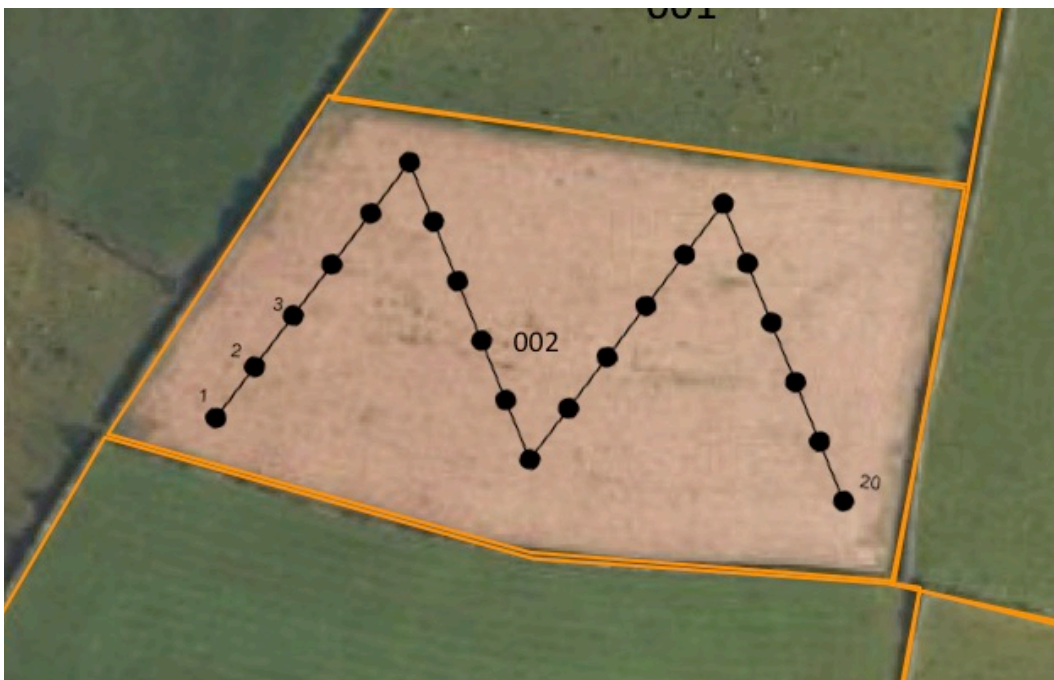
Where to take soil samples?

It is very important to prepare a soil sampling map showing defined soil sampling areas. This will form the basis as to where soil samples are taken and will identify fields / management blocks on the farm for nutrient applications.



How to take soil samples?

1. A suitable soil corer for sampling to 10 cm deep is essential.
2. Take a soil sample every 2 to 4 ha.
3. Take a representative soil sample by walking in a W shaped pattern across the sampling area.

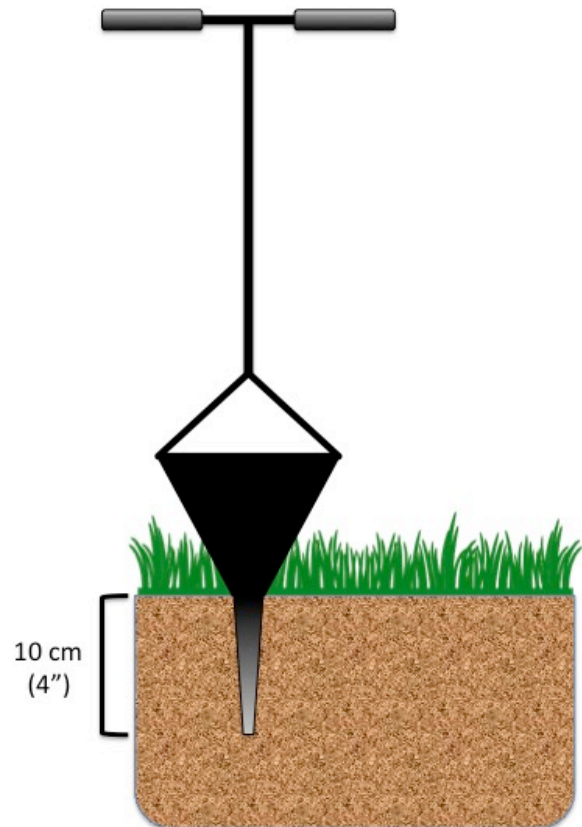


4. Take separate samples from areas that are different in soil type, previous cropping history, slope, drainage or persistently poor yields.
5. Avoid any unusual spots such as old fences, ditches, drinking troughs, dung or urine patches or where fertilizer / manures or lime has been heaped or spilled in the past.
6. Take a minimum of 20 soil cores, mix them together, and take a representative sub-sample for analysis.
7. Sample at the same time of the year to aid comparisons of soil sample results and avoid sampling under extremes of soil moisture conditions e.g. waterlogged or very dry soils.
8. Place the soil sample in its own individual bag or container to avoid contamination, and label the sample with the field and sample number.

Depth to take soil samples?

Nutrient advice is based on sampling soil to a depth 10 cm of soil. Therefore it is critical that all soils are sampled from the top 10 cm. This is particularly important for grassland soils as P is immobile and tends to stay in the top few centimetres of soil.

For tillage soils that are ploughed, soil sampling depth is not as critical as there is more uniform nutrient status in the top 15 to 20 cm of soil. Sampling the top 10 cm will be critical for reliable measure of soil P levels in min-till / low-till crop establishment systems.



When to take soil samples?

Take soil samples once every 3 to 5 years. Soil nutrient levels change slowly over time. Therefore soil test results will provide the basis for nutrient advice for a number of years until soils are resampled. The best time of the year to take soil samples generally tends to be September to March. More regular soil sampling may be required where extra P and K are applied to improve soil fertility levels. This will provide an indication as to the rate of soil pH, P or K improvement overtime.

Jan	Feb	Mar
Apr	May	Jun
Jul	Aug	Sept
Oct	Nov	Dec

Time to wait between spreading lime, fertiliser, slurry or manures and taking soil samples?

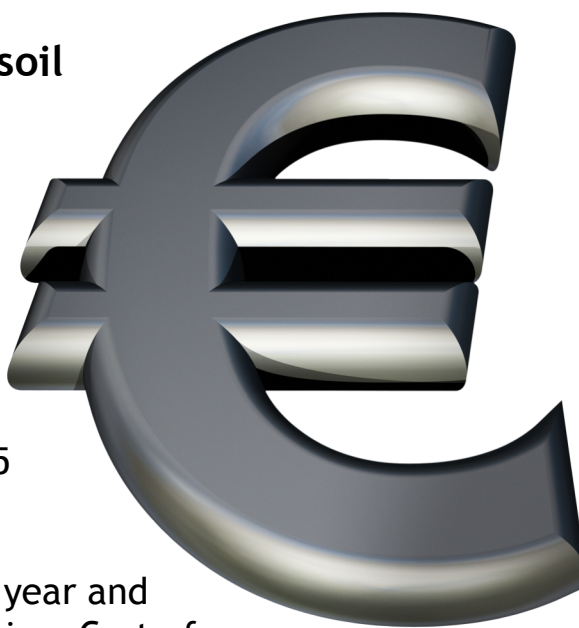
- **LIME:**
Allow at least 2 years after lime application before sampling a field for an accurate soil pH reading.
- **FERTILISER:**
Allow at least 3 months after the last application of fertiliser P and K.
*(N or S fertilisers do not have any effect.
Only fertilisers containing P and K are an issue).*
- **SLURRY & MANURES:**
Allow at least 3 months after the last application of manure or slurry.

Cost/Benefit of taking soil samples?

Soil testing represents a small annual cost and provides field by field information for the farm.

A standard (pH, P & K) soil test taken once every 5 years over a 4 ha (10 acre) sampling area will cost approximately €0.50/acre/year and includes lime, N, P & K advice. Cost of analysis will vary depending on sampling and laboratory charges, and on the detail and number of nutrients being analysed.

Soil sampling represents a very small overall cost when considered against the potential improvement on the return on investment in fertilisers.



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