

Advice Sheet 4: How to take a soil sample

The importance of getting a representative sample

The first point to remember about soil analysis is that any analytical result is only as good as the sample taken. Let us consider one sample taken in a 5 hectare area, that sample might weigh 250g to 500g. If it were to weigh 500g, and we were looking at a soil depth of 15cm, then that 500 g would be half a kilogram out of 1.8 million kilograms! Of that 500g, once it reaches the laboratory it will be well mixed and a lot less soil used for analysis. So for a sample to be representative of all that soil, it must be taken carefully.

Sampling strategy

When deciding upon a sampling strategy there are some key points to consider:

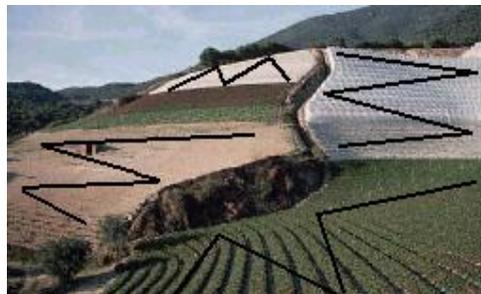
- What are we sampling for? Is it a routine analysis to determine basic soil nutrient properties? Is the sample for diagnosing a problem?
- What area is to be sampled?
- What depth should samples be taken from?
- When should samples be taken?

How many samples should I take?

This depends on the type of soil analysis. Generally, as a simple rule of thumb you should take at least one sample for each area that you are going to manage. For example, you should take one representative sample per field, if you are going to manage nutrients on a field scale. If you know that different areas of the field perform in different ways then you should take a representative sample from each area. If you have a problem area, you should take one sample from the problem area, and one from a good area – to check background levels, so you have something to compare your problem with – a point of reference.

It should be noted that the number of samples per field is a trade-off between accuracy and analytical cost. Whilst additional samples cost more money, keeping to one sample as the field size doubles, halves the accuracy.

If the sample is for monitoring of soil properties a W pattern of as many cores as possible should be taken through the area in question – avoid irregular patches such as gateways, headlands and trees. Please see diagram below.



Never sample just after fertiliser or lime application, leave at least 6 months before sampling (except Nitrogen), or six weeks after last organic manure application in the autumn, avoid sampling when very dry or water logged.

How deep should the sample be?

This depends on how the soil is to be managed. If a 50 cm deep excavation is to take place, then the whole of the 50 cm should be sampled, if the nutrient is to be applied to the surface and left, unincorporated (as in Permanent Grassland) then there is no point in sampling to this depth.

Again a simple rule of thumb – sample as deeply as the soil you are managing. For arable and cultivated soils this is typically 0-15 cm (0-6”) and is related to cultivation depth. For permanent grassland, then a typical depth of 0-7.5 cm (0-3”) is used and this is related to the rate of soil formation and animal penetration. Deeper sampling may be required for mobile nutrients such as nitrogen¹, where larger volumes of soil are to be disturbed or where soil nutrient problems are identified at particular depths (mineral layers etc).

When should samples be taken?

Generally soil nutrient sampling should be incorporated into a quality crop or grassland management scheme.

- Sampling can also be required when crop problems have been identified, - look for signs of mineral deficiencies, stunted growth, discolouration of the crop, leaf mottling and premature leaf death for example.

How much Sample do I need to send to NRM?

- 350g of soil is sufficient – a full white soil sample box.

Tools for sampling

Essential tools for soil sampling include:

- A suitable soil auger (you are advised to use gloves)
- A plastic bucket
- Analysis request forms and suitable sample packaging

Soil sampling at depth is best achieved with a soil sampling auger², these devices allow you to sample at depth without digging, and make sampling at the correct depth relatively straight forward. A plastic bucket is essential for collecting cores and mixing them before putting them in the sample packaging – avoid the use of metallic buckets as often they contain elements such as zinc, which can contaminate trace element analyses.

Samples should be packaged securely and individually labelled – remember they need to survive the transit process which is out of your and NRM's control!

¹ There are special requirements for the sampling and analysis of soils for soil mineral nitrogen – please contact NRM for details.

² If you do not possess a soil sampling auger, NRM have a range of suitable augers in stock. Please contact the laboratory for current prices and availability.

* Essential for making crop recommendations

Paperwork – why it matters

It is critical that all samples are submitted with the correct paperwork – this is because the paperwork identifies:

1. Who the sample has come from
2. Where the sample has come from
3. Your client's details
4. The names of the samples (cross-referenced with the samples packaged)
5. Details of the crops to be grown in the fields sampled
6. Soil type (important for determining nutrient losses to leaching)
7. Whether straw has been removed
8. Whether farm yard manure has been applied

For these reasons it is worth taking time to complete paperwork carefully. Without this information, reports will appear incomplete and fertiliser recommendations cannot be made because they are crop dependent. For this reason, it is essential to include the cropping information, detailed on the next page.

Soil information should be entered as follows, using the coded numbers for convenience.

- 1 Light Sandy soils
- 2 Medium textured soils – loams
- 3 Heavy soils
- 4 Organic Soils
- 5 Peaty Soils

Arable and forage crops

WW - Winter Wheat

SW - Spring Wheat

WB - Winter Barley

SBA - Spring Barley

WO - Winter Oats

SO - Spring Oats

WOSR - Winter Oilseed Rape

SOSR - Spring Oilseed Rape

FR - Forage Rape Grazed

LI - Spring Linseed

PED - Peas (Dried and Vine)

BE - Field Beans

KA - Kale Grazed

SBT - Sugar Beet

FTU - Forage Turnips

ST - Stubble Turnips Grazed

FSG - Forage Swede Grazed

SD - Forage Swedes Roots Returned

MA - Mangels

FB - Fodder Beet

MZ - Forage Maize

TR – Spring Triticale

WTR – Winter Triticale

SF - Sunflowers

RY - Rye

RGS - Rye Grass For Seed

Vegetables and Bulbs

PE - Market Peas
BR - Brussel Sprouts
CB - Cabbage
CF - Cauliflowers
CA - Maincrop carrots
ON - Onions
BU - Bulbs
RB - Beetroot
ME - Mint Establishment Year
PUM - Pumpkin

CL - Calabrese
CY - Celery
CO - Courgettes
RA - Radish
LK - Leeks
PN - Parsnips
TU - Maincrop Turnips
LET - Lettuce and Leafy Salads
MS - Mint Subsequent Year

CS - Culinary Swede
SWC - Sweetcorn
ASP - Asparagus Preplanting
ASS - Asparagus Established
BB - Broad Beans
DB - Dwarf Beans
RUNB - Runner Beans
CD - Coriander
PM - Potatoes Main

Fruit, Vines and Hops

TF - Top Fruit
HO - Established Hops
STR - Strawberries Established
RBY - Raspberries Established
VI - Vines Established
BC - Blackcurrants Established
RC - Redcurrants Established

GB - Gooseberries Established
LB - Loganberries Established
TB - Tayberries Established
BBY - Blackberries Established
HP - Hops Preplanting
FP - Fruit Preplanting
VP - Vines Preplanting

CHY - Cherries Established
PLM - Plums Established
PRS - Pears Established
APL - Apples Established
BLB - Blueberries Established

Grass

SI1 - Silage 1st Cut
SI2 - Silage 2nd Cut
SI3 - Silage 3rd Cut
SI4 - Silage 4th Cut
HA - Hay
RS - Grass Reseed
PP - Perm Pasture
GZH - Horse Pasture
GZ - Grazing

Crops Without Recommendations

SA - Set Aside
PL - Ploughed/Fallow
MEG - Miscanthus / Elephant Grass
WLO - Willow
OC - Other Crop