

GRASSLAND DEVELOPMENT CENTRE CANOLFAN DATBLYGU TIR GLAS

Sefydliad Gwyddorau Biolegol, Amgylcheddol a Gwledig

Canolfan Datblygu Tir Glas, Gogerddan
Aberystwyth, Ceredigion SY23 3EB
Ffôn: (01970) 823000/Ffacs: (01970) 828357
E-bost: hym@aber.ac.uk

Institute of Biological, Environmental & Rural Sciences

Grassland Development Centre, Gogerddan
Aberystwyth, Ceredigion, SY23 3EB
Tel: (01970) 823000/Fax: (01970) 828357
Email: hym@aber.ac.uk

116.01 Soil Assessment and Analysis

Soil health and fertility is key to successful farming. Good soil management depends on assessing soils and using soil analyses effectively. Monitoring tells you how your farming practices are affecting the soil. This factsheet outlines how to check soil health and quality. There are good financial, production and environmental reasons for doing so!

Soil terminology

Soil texture - defined by the relative proportions of sand silt and clay. Accurate percentages need mechanical analysis, but it can be gauged by sight and feel.

Rub some moist soil between your finger and thumb:

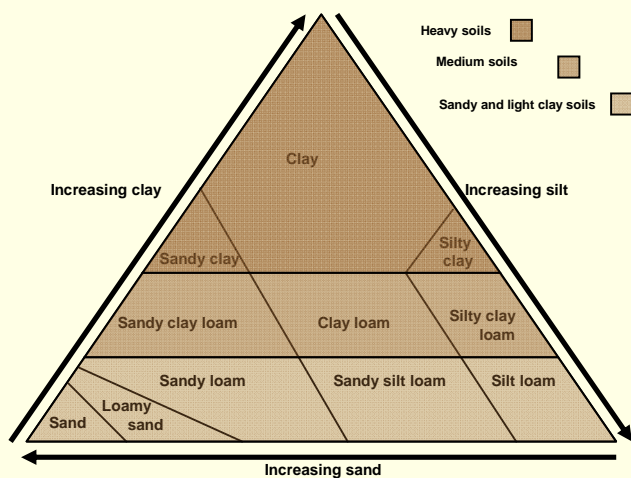
Sand feels gritty and when moulded into a ball and is easily deformed.

Silt has a smooth, silky or floury feel.

Clay is sticky when wet and takes a polish when rubbed.

Loams are soils that are intermediate in texture.

The properties of a specific texture may also be modified by a combination of the above and the inclusion of gravel and stones.



You *cannot* change soil texture BUT knowing what it is will help management decisions

Soil structure - the size & development of soil aggregates (peds) through which roots grow, and water and air move.

Good soil structure - has well formed porous aggregates with rounded edges which can be broken between fingers when moist.

Poor soil structure - is compact, has a blocky appearance and is harder to break apart.

Soils with high organic matter often have good structure because of the larger and stronger soil aggregates it helps to create.

Structure is related to texture;

Sandy and peaty soils tend to have weak structure with 'peds' that easily break down to individual particles.

Clay soils have stronger and more obvious peds, heavy clay soils shrink and swell with the water content changes in the year.

Although related to texture, farming practice can alter soil structure by improving organic matter levels and avoiding compaction. Research has shown that clover roots can improve soil structure.

Soil profile is the layers of soil, (horizons) in a soil pit (hole dug in the ground).

It provides information on:

- Topsoil depth – shallower in permanent grassland than ploughed soils,
- Drainage of the layers from their colour; dark - topsoil from high organic matter rusty colour - from poor drainage grey - 'gleyed' areas from temporary or permanent water logging from root depth; deep roots indicate freely draining soils.

What you can do

Look after your soils

Avoid compacting, poaching and smearing; they: restrict root growth, reduce earthworms give a poor response to fertiliser & FYM, grow less grass, and are prone to waterlogging and drought.

Test soils

Soil analysis gives a 'snapshot' of available nutrients on which to base input and cropping decisions in the short and medium term.

Soil testing identifies:

- fields low in nutrients where inputs will increase total production, improve early and late season growth, increase ryegrass and clover content, reduce the 'weed' grasses and broad leaf weeds and increase the uptake of fertiliser nutrients.
- fields with high nutrient levels; so inputs can be reduced, apply appropriate compounds, target manure and slurry to where its needed, reduce cost and protect the environment.

Standard soil tests assess pH (lime), phosphate (P), potash (K) and magnesium (Mg).

Results are expressed as an index (or parts/mg) and a guide as to whether they are adequate for grass and clover.

Unless a particular problem is suspected like a trace element deficiency, soil toxicity or organic matter levels, a standard test is adequate. Organic farmers may need a 'clay content' if K is low.

It is more cost effective, and reliable, to analyse other nutrients, including sulphur, in herbage samples.

How to sample for analysis

Sample regularly

- every 4 or 5 years for silage fields where nutrients are removed with each cut
- every 7- 8 years on grazing land
- every 2-3 years, on very sandy soils or in high rainfall areas
- at the same time of year or stage in the rotation
- at least 2 months after the last manure, slurry or fertiliser application
- fields that are underperforming, where ryegrass content is dropping
- fields planned for reseeding or oversowing
- fields receiving high inputs of muck/slurry.

Sample to 7.5cm with a corer or trowel for grassland (to 15cm for arable)

- take a representative sample by walking across the field in a 'W' shape.
- take about 25 samples and bulk them up.
- avoid gateways, feeding areas etc.
- sub sample from this into a poly-bag, enough to fill a tea mug, then send it off for analysis.

If a field has very different aspects/soil types, take a bulked sample from each area.

Companies offering soil analyses include:

Eurofins (01902 693190),
Cotswold Analytical Services (01989 780511), Elm Farm Research Centre - OAS (01488 657600), Glenside Fertility Farming Systems (01786 816655), Independent Soil Services (01553 636600).

FURTHER INFORMATION

Web: www.grassdevcentre.co.uk

Factsheet 101.01 - Recognising and Solving Soil Physical problems - this outlines problems, how to correct problems, and how to manage soils to prevent damage.