ASSESSING YOUR SOILS 6

Assessing soil textures in mineral soils

When you do not know the proportion of sand, silt and clay particles in your soil, you can estimate using the following method. Take about a dessert spoon of freshly dug out soil. If too dry, wet up gradually, kneading between finger and thumb until soil crumbs are broken down. Enough moisture is needed to hold the soil together and to show its maximum stickiness. Follow the paths in the diagram to get to the texture class.

Assessing soil structure

Assessing topsoil structure can help you identify potential soil problems. It is useful to compare different fields with different soil structures. Consider previous land use in these areas, e.g. are these fields in grass or have they received heavy machinery traffic? If possible, choose several sites around a field to assess soil structure; the best time to look at topsoil is when the soil is moist and during spring or early summer when root development will be most obvious. It will be difficult to assess soil structure if soil is very wet or too dry.

You will need to take a spade and a knife plus pen and paper or camera if you want to record your results. Comparison of photographs of soil often reveals information about the soil which was not obvious in the field.

Using the spade, dig out a square or 'spit' of topsoil, keeping the spade as vertical as possible in the soil. Alternatively you could dig a hole of around 40cm (16 inches) in depth to reveal the soil profile.

Using the following table, examine the soil profile both on the spit of soil and in the hole where it came from. Your findings should allow you to make a basic assessment of soil structure.

Take note of	How to do it	What to look for	Possible structural indications
Soil surface	Examine the surface of the soil	Resistance to penetration and a visible crust may have developed	Capping at the soil surface
Compacted zones	Using the knife, move down the soil profile and look for any hard or compacted layers	Hard layer present in soil profile Note the depth and thickness of any hard or compacted layers	Compaction / poor structure
Root development (this may be less relevant for freshly ploughed sites)	Using knife or fingers gently prise apart the roots from the soils	Look at root structures. In well-structured soils, roots should be growing without restriction and should be numerous and well branched with plenty of fine root hairs and occupying the whole soil volume	
	Note maximum depth of rooting and depth of any growth restriction	Signs of growth restriction may be seen, e.g. roots running sideways, confined to pores or growing between clods (although this may be a feature of a heavy clay soil)	Soil could be suffering from compaction

Take note of	How to do it	What to look for	Possible structural indications
Structure and organisation of particles	Gently break large clods and plates by hand	Predominantly stable crumb structure made from a mixture of small more rounded and easily broken aggregates Note size and shape of clods and aggregates and how friable they are. Absence of crumbs and presence of large blocky or horizontal plates, often hard to break in clay and loamy soils	Good structure Poor structure
Colour of soil profile and presence of cracks	On large clods look for cracks On whole section look for difference in coloration, e.g mottling, presence of greyish blue or orangey patches or layers and a bad smell (rotten eggs)	Absence of crumbs. Almost single grain structure seen in sandy soil If cracks less than 0.2mm Gleying is sign of anaerobic conditions and reduced aeration Homogenous brown colour	Poor structure Poor structure Could have impeded drainage and/or compaction problems Could indicate impeded drainage and/or compaction Good drainage
Worms and other biological activities		Presence of worm activities. Channels at depth and casts at surface Look for fungus mycelium. Indicative of more acidic conditions	Good structure Possible drainage problems

Ground condition assessment using the heel or 'squelch' test.

Walking on fields and taking note of how the ground feels underfoot can give a simple indication as to how vulnerable soils could be to damage from traffic or livestock

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1 Baked Hard	2. Dry on Top	3.Damp and Firm	4.Damp and Soft	5. Squelchy in patches	6. Squelchy all over	7. Very Soft	8. Waterlogged
Good Condition						**Poor condition**	
From 1-3 the soil is suitable for stocking and trafficking with low risk compaction and rutting of damage			From 4-8 the soil is increasingly likely to suffer from compaction and rutting			From 6-8 stock or traffic on the land could result in significant soil damage.	