

Soil Management Plan

Supporting Document



Department
for Environment
Food & Rural Affairs



**PEAK
DISTRICT**
NATIONAL
PARK

**Farming in Protected
Landscapes programme**

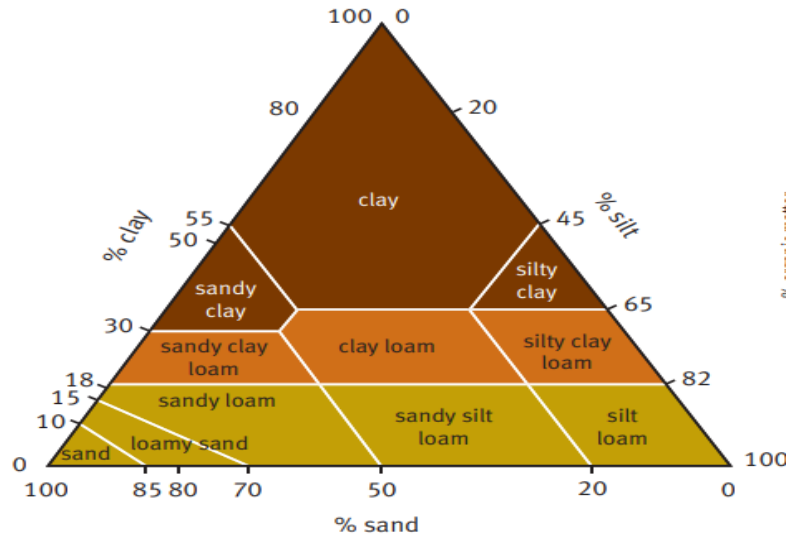
This guidance and template have been produced to help farmers meet the requirements of the SFI option (2023)

Using this template isn't a requirement of SFI

Soil Characteristics

1 - Soil Type/Texture

Soil Texture can be found on your soil sample, dependant on the % of sand, silt & clay



4A - Slope:		4B - Runoff Risk:
Level	1	Low
Gentle	< 3 D	Low
Moderate	3 - 7 D	Moderate
Steep	> 7 D	High
V Steep	> 11 D	V High

5A - Land Use:	5B - Erosion Risk:
Grassland	Low
Cereal Crops	Moderate
Forage Brassicas	Moderate
Forage Maize	High
Late Winter sown?	High

Use diagram above to determine Soil Classification

2 - Soil Classification

- Heavy soils
- Medium soils
- Sandy and light soils

3 - Soil Erosion Risk

- High risk
- Moderate Risk
- High Risk




Soil Structure Assessment

Soil structure affects how air and water move in the soil and how well crops or grass grow

6A - Soil Surface

Good	Moderate	Poor
		
<p>Sward/Crop intact No Poaching Few wheelings</p>	<p>Some surface poaching wheelings in places some weed species present</p>	<p>Surface capping Soil exposed Severe Poaching Poor sward quality</p>

6B - Soil Structure

Good	Moderate	Poor
		
<p>Crumbly, small and rounded aggregates Good soil structure Highly porous Numerous, well distributed roots Sweet and earthy smell</p>	<p>Firm, rounded but more angular Adequate soil structure Less visible pores Moderate root distribution No strong smell</p>	<p>Compact, large aggregates Poor soil structure low porosity Poor rooting, soil mottling Bad smell</p>

7 - Earth Worm count

Earthworms improve plant productivity, are principally responsible for engineering the soil environment and are an important food source for native birds such as the song thrush. There are up to 10 common earthworm species in agricultural soils and these can be grouped into three ecological types: epigeic, endogeic and anecic earthworms – each group having a unique and important function. Earthworms are an indicator of soil health, being impacted by pH, waterlogging, compaction, tillage, rotation and organic matter management.

When is the best time?

Spring and Autumn are the best times to carry out earthworm assessments

Warm & wet are usually the best conditions

- 1 - Dig out a soil pit 20cm x 20cm x 20cm
- 2 - Hand sort soil placing earthworms into pot
- 3 - Count and record total number of earthworms
- 4 - Separate into Adults and Juveniles (see image)
- 5 - Return earthworms to soil pit and backfill with soil
- 6 - Repeat with 10 soil pits per field



Identifying adults and juveniles

Adult earthworms have a clearly developed **saddle** (reproductive ring) and juveniles do not.

You may need to rinse worms with water to determine if a saddle is present.

Size is not a good indicator of maturity as adult earthworms typically range in size from 2 cm to 15 cm, depending on species.



8 - Water Infiltration Test

(*Not essential under SFI but a good indicator and some milk purchasers require)

Water infiltration rates provide information on soil structure. Improved infiltration of rainfall helps to reduce soil erosion and loss of nutrients from land to water

Drainpipe Test

Cheap and simple way of measuring water infiltration rate of water into soil via macro and micro pores

You will need:

Short length of pipe 10cm diameter and 20cm long

Mallet

Stopwatch (phone?)

5L of water

Step by Step

- 1 - Drive the pipe halfway into the ground 10cm in the ground 10cm above ground
- 2 - Pour in water 800ml to a depth of 10cm
- 3 - Start stopwatch, measure time taken for water to drain into the soil
- 4 - Repeat at several locations eg where wheelings may exist
- 5 - After test check areas of infiltration for compaction with spade

In well structured soil water should drain away within 5 minutes for light/medium soil, Heavy Clay with poor soil structure may take 20+ minutes

How to improve water infiltration?

The use of organic materials such as manures can improve soil structure, infiltration and the ability for soil to absorb increasingly intense rainfall.



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9 - Management Proposals

	Relieves compaction	Relieves runoff	Prevents poaching	Improve soil OM	Reduces waterlogging	Reduce wind erosion
Natural & Semi-natural Grassland						
Adjust stocking rates to prevent overgrazing	Y	Y	Y		Y	Y
Rotate stock to prevent overgrazing	Y	Y	Y	Y	Y	Y
Maintain tracks to minimise runoff		Y	Y		Y	
Minimise machinery use and low ground pressure tyres	Y	Y		Y	Y	
Supplementary feed on ground away from sensitive vegetation	Y	Y	Y	Y	Y	
Regularly move supplementary feeding sites	Y	Y	Y	Y	Y	
Keep supplementary feeding sites away from watercourses	Y	Y	Y	Y	Y	
Minimise areas of bare ground		Y	Y	Y	Y	Y
Limit livestock access to riverbanks, install drinking troughs	Y	Y	Y			
Improved Grassland						
<i>As above where relevant</i>						
Maintain land drainage to reduce risk of soil damage under wet conditions		Y	Y		Y	
Use well drained tracks for vehicle and livestock	Y	Y	Y		Y	
Remove sward compaction, subsoiler/aerator	Y	Y			Y	
Regularly move ring feeders/troughs or place on stone base	Y	Y	Y		Y	
Re-seed early to establish good cover prior to winter		Y			Y	
Livestock removal under wet conditions	Y	Y	Y	Y		
Locate outwintered stock on freely drained fields that will not lead to erosion	Y	Y	Y	Y	Y	
Cereals, Forage Crops and Grass re-seed						
Manage grazing of forage crop residues to minimise poaching and runoff. Regular movement of fences, strip grazing and run back area	Y	Y	Y		Y	
Reduce bare ground over winter with cover crop or weedy stubble		Y	Y			Y
		Y			Y	Y
Maintain land drainage		Y			Y	
Where organic matter is low apply bulky manures, grow cover crops or establish grass leys		Y		Y		
Reduce cultivations where possible consider direct drilling		Y		Y		Y
Minimise and check for soil compaction, alleviate at correct depth	Y	Y			Y	