Healthy Grassland Soils –
Four quick steps to assess soil structure

Step one: **Surface assessment**

Look at sward quality to identify potentially damaged areas which require further assessment.

Good
- Sward intact
- No poaching
- Few wheelings

Moderate
- Surface poached
- Wheelings in places
- More weed species

Poor
- Surface compacted
- Soil exposed
- Poaching
- Poor sward quality

Step two: **Soil extraction**

- Dig out one spade-sized block of soil (depth approx. 30cm). Cut down on three sides and then lever the block out leaving one side undisturbed
- Lay soil block on a plastic sheet or tray

Tip: When starting out it is useful to dig in an area where you know there may be a problem (eg a gateway) and get familiar with signs of soil structure damage.

Remember: Sample when the topsoil is moist – if the soil is too dry or too wet it is difficult to distinguish signs of poor soil structure.

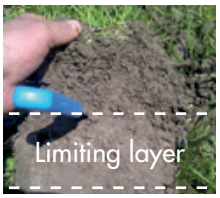
Step three: **Soil assessment**

Gently open the soil block like a book to break it up

- If the structure is uniform – assess the block as a whole
- If there are two or more horizontal layers of differing structure identify the layer with the poorest structure
- Carry out the rest of the assessment on this **limiting layer**

Moderate over Good

Good over Poor



Step four: **Soil scoring**

Break up the soil with your hands into smaller structural units (known as aggregates)

- Assign a score by matching what you see to the descriptions and photos overleaf
- A score of **1 or 2 is Good**; a score of **3 Moderate**; and **4 or 5 is Poor** and requires management action
- Record depth of limiting layer to assess management options

Good

Moderate

Poor

1cm
2cm
3cm
4cm
5cm
6cm
7cm
8cm
9cm
10cm
15cm
20cm
25cm

Place the top of the page level with the surface and assess the soil below

Structure quality	Identification of structural problem eg limiting layer	Soil structure features	Description
Score 1 Friable Aggregates readily crumble with fingers		 Small (<6mm), round	• Good soil structure • Highly porous • Many roots • Sweet earthy smell • No signs of compaction
Management Options	Re-assess after equipment crosses the ground or grazing in wet conditions or every two years.		
Score 2 Intact Aggregates easily break apart		 Rounded (10mm)	• Good soil structure • Porous • Good root distribution • Earthy smell • Some indication of larger aggregates
Management Options	Re-assess after equipment crosses the ground or grazing in wet conditions or yearly in spring.		
Score 3 Firm Most aggregates break down		 Round (10mm) but some are angular	• Adequate soil structure • Some aggregates non-porous, less visible pores • Moderate root distribution • No strong smell • Some indication of reduced porosity • Fewer worms
Management Options	Consider infrastructure changes (eg back-fencing, multiple field entrance or tracks) to minimise traffic in marginal weather conditions.		
Score 4 Compact Effort needed to break down aggregates		 Larger (>5cm) angular	• Large angular aggregates (>5cm across) with low pore numbers • Some red/orange mottling maybe present (sign of poor drainage) • Roots clustered in large pores, worm channels and cracks between aggregates • May have sulphur smell (ie bad eggs)
Management Options	Consider use of sward slitter or aerator (if poor soil structure <10cm) or top-soiler or sward lifter (if poor soil structure deeper than 10cm).		
Score 5 Very compact Aggregates compact, difficult to pull apart and platy		 Large initially (>10cm) angular	• Very large angular aggregates (>10cm), with very few pores • Any roots seen mainly at the surface or clustered down large pores or cracks • May have grey colour with red/ orange mottling (sign of poor drainage) • May have strong sulphur smell (ie bad eggs)
Management Options	Use sward slitter or aerator (if poor soil structure <10cm) or top-soiler or sward lifter (if poor soil structure deeper than 10cm). Assess sward and plough and reseed if required.		

Based on the VESS method of soil structure assessment (www.sruc.ac.uk/vess)
See Healthy Grassland Soil Pocketbook for more information. It is available at www.healthygrasslandsoils.com.