**Healthy grassland soils** Four quick steps to assess soil structure

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**Step one: Surface assessment**

Look at the quality of the sward to identify potentially damaged areas that require further assessment. Where the sward is moderate or poor, this may indicate that further investigation of the soil quality is required.

- **Good**
  - Sward intact
  - No poaching
  - Few wheelings

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

- **Poor**
  - Surface capping
  - Soil exposed
  - Severe poaching
  - Poor sward quality

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**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 the 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 (e.g., 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.

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**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 (the limiting layer)
- Carry out the rest of the assessment on this limiting layer

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**Step four: Soil scoring**

Break up the soil with your hands into smaller structural units or aggregates (soil clumps).

- 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 is **Moderate** and 4 or 5 is **Poor** and requires management action
- Record the depth of the limiting layer to assess management options
### Score 1 – Crumbly (aggregates readily crumble with fingers)

<table>
<thead>
<tr>
<th>Identification of structural problem eg limiting layer</th>
<th>Soil structure features</th>
<th>Description</th>
<th>Management options</th>
</tr>
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</table>
| ![Small (< 6mm), rounded](image1.png)                  |                         | - Good soil structure  
- Highly porous  
- Numerous, well-distributed roots  
- Sweet, earthy smell  
- Small, rounded aggregates | Reassess after equipment crosses the ground, after grazing in wet conditions or every two years. |

### Score 2 – Intact (aggregates easily break apart)

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| ![Rounded (10mm)](image2.png)                          |                         | - Good soil structure  
- Earthy smell  
- Porous  
- Some indication of larger aggregates  
- Good root distribution | Reassess after equipment crosses the ground, after grazing in wet conditions or annually in spring. |

### Score 3 – Firm (most aggregates break down)

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| ![Rounded (10mm), but some are angular](image3.png)    |                         | - Adequate soil structure  
- Larger aggregates, some angular  
- Moderate root distribution  
- No strong smell  
- Less visible pores | Consider infrastructure changes (eg back-fencing, multiple field entrances or tracks) to minimise traffic in marginal weather conditions. |

### Score 4 – Compact (effort needed to break down aggregates)

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| ![Larger (> 5cm), angular](image4.png)                  |                         | - Large, angular aggregates (> 5cm across) with low pore numbers  
- Some red/orange motting may be present (sign of poor drainage)  
- Roots clustered in large pores, worm channels and cracks between aggregates  
- May have sulphur smell (ie bad eggs) | If soil structure is poor at a depth of less than 10cm, use a sward slitter or aerator. If soil structure is poor at a depth of 10cm or more, use a sward lifter or top-soiler. If the sward is poor, consider ploughing or reseeding. |

### Score 5 – Very compact (aggregates are compact, difficult to pull apart and platy)

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| ![Large initially (> 10cm), angular](image5.png)       |                         | - 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 motting (sign of poor drainage)  
- May have strong sulphur smell (ie bad eggs) | If soil structure is poor at a depth of less than 10cm, use a sward slitter or aerator. If soil structure is poor at a depth of 10cm or more, use a sward lifter or top-soiler. If the sward is poor, consider ploughing or reseeding. |