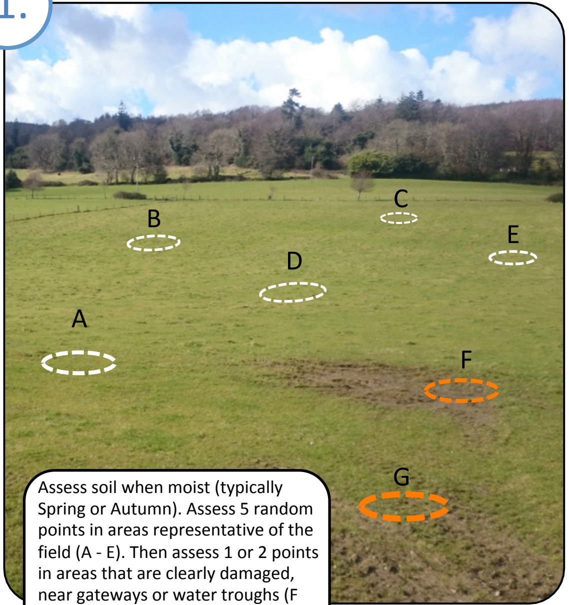
How to conduct GrassVESS

1.

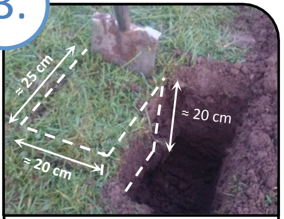


Assess soil when moist (typically Spring or Autumn). Assess 5 random points in areas representative of the field (A - E). Then assess 1 or 2 points in areas that are clearly damaged, near gateways or water troughs (F and G). This will give a comparison between undamaged and damaged areas. At each point, an intact sample block of soil is extracted by spade.

2.

Dig a hole, wider and deeper than an intended sample block. Do not stand on or lean the spade against the sample block.

3.



Mark out and carefully loosen the sample block with straight spade insertions.

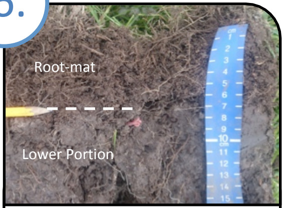
4.

Carefully lever out the sample block on the spade and place on a plastic sheet or tray.

5.

Using a knife or trowel, open the sample block like a book. It is useful to use the sward to gently pull the sample apart.

6.



Identify layers of different structure. Measure and record the depth of the root-mat and the overall sample. If no distinct root-mat layer is present, treat the upper 6 cm as such.

7.

Conduct the assessment described overleaf. First examine the lower portion and then the root-mat layer. Record results on the GrassVESS records sheet.

Results

Structural quality (*Sq*) and Root-mat (*Rm*) scores indicate the impact of land management on soil structure at different soil depths. This can help in making management decisions. Low scores indicate that land management is not negatively impacting soil structure. High scores indicate that management is negatively impacting soil structure and changes in management may be necessary.

Lower Portion (*Sq*) Score

Sq 1 **Optimal Structure**
No change in management necessary. Aim to maintain this soil structure condition.

Sq 2 **Good Structure**
Generally, no change in management necessary. However, if *Sq* 1 was obtained in a previous assessment, some minor changes in management may be required.

Sq 3 **Moderate Structure**
Changes in management necessary. Avoid livestock and machinery traffic in wet conditions and allow the soil to recover naturally.

Sq 4 **Poor Structure**
Changes in management necessary. Seek advice as interventions such as ploughing and reseeding may be required.

Root-mat Layer (*Rm*) Score

Rm 1 **Optimal Structure**
Management is not impacting the root-mat. Aim to maintain this soil structure condition.

Rm 2 **Moderate Structure**
Management is starting to negatively impact the root-mat. Avoid livestock and machinery traffic in wet conditions and allow the soil to recover naturally.

Rm 3 **Poor Structure**
Management is negatively impacting the root-mat. Seek advice. Depending on the depth of the root-mat layer and the condition of the lower portion, either allowing natural recovery or interventions such as ploughing and reseeding may be required.

Teagasc

UCD Dublin

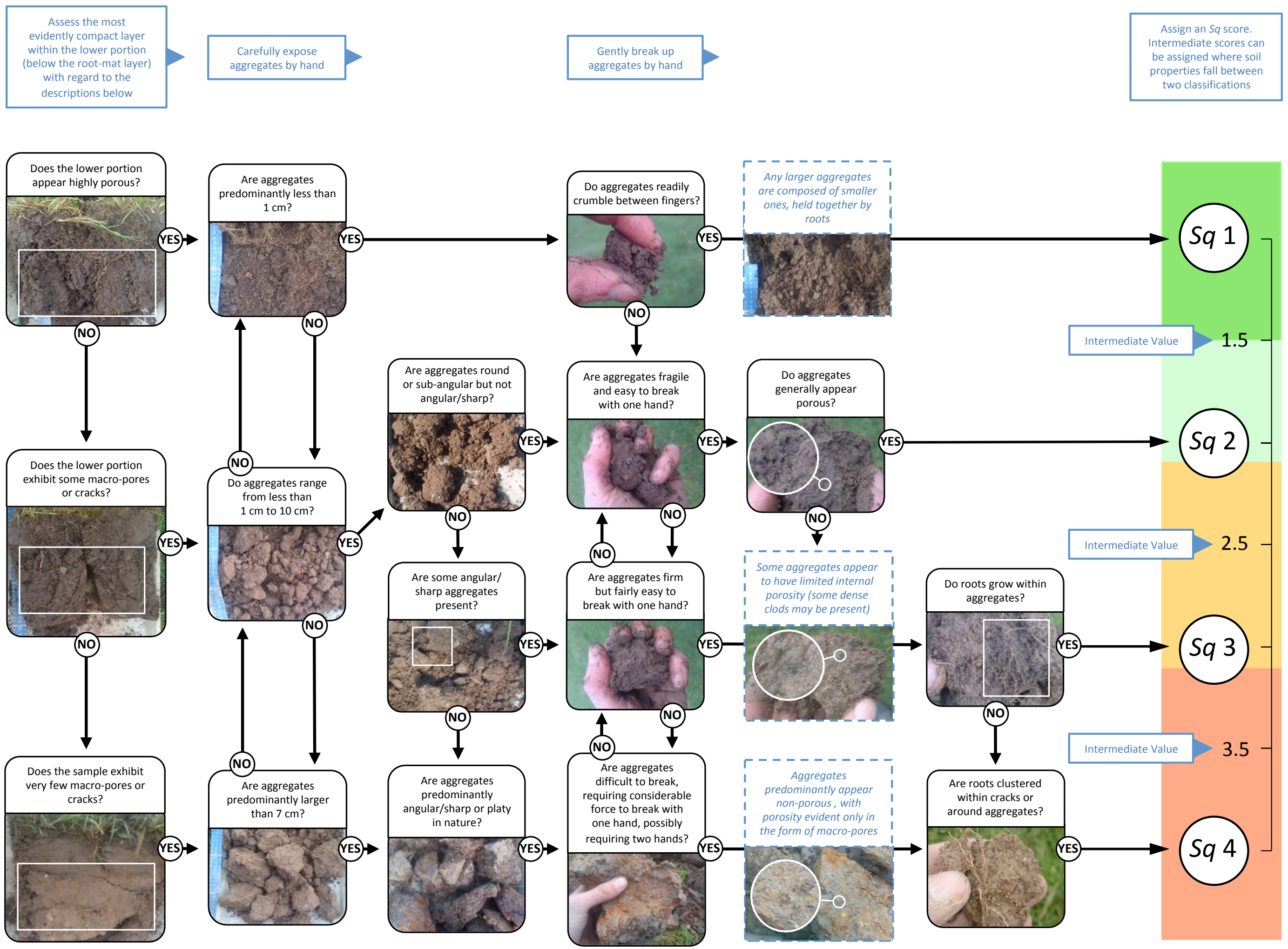
Department of Agriculture, Food and the Marine
An Roinn Talmhaíochta, Bia agus Mara

J.P. Emmet-Booth, O. Fenton, P.D. Forristal, G. Bondi, R.E. Creamer, E. Jeuken & N.M. Holden. 2017. GrassVESS is based on the Visual Evaluation of Soil Structure (VESS) Method developed by B.C. Ball, R.M.L. Guimarães, T. Batey & L.J. Munkholm.

G r a s s V E S S

Start assessment here

Lower Portion (*Sq*) Score



Root-Mat (*Rm*) Score

Take a root-mat layer section. While holding it upside down, gently prize it apart using your thumbs. Examine the undisturbed soil within this layer and assign one of the following *Rm* scores which best applies

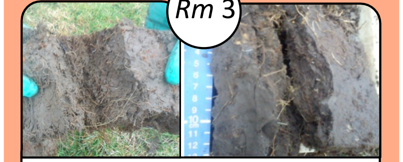
Rm 1

- Aggregates are predominantly less than 1cm
- The layer appears loose and highly porous
- Roots grow throughout the layer

Rm 2

- Aggregates range from less than 1 cm to 6 cm
- Some angular/sharp aggregates may be present
- The layer exhibits some porosity, though zones of limited porosity are evident
- Roots grow throughout the layer

Rm 3



- Aggregates are predominantly larger than 5 cm
- Angular/sharp, blocky aggregates are present
- Both the overall layer and individual aggregates exhibit limited porosity
- Roots may or may not grow within the layer

J.P. Emmet-Booth, O. Fenton, P.D. Forristal, G. Bondi, R.E. Creamer, E. Jeuken & N.M. Holden. 2017.

GrassVESS is based on the Visual Evaluation of Soil Structure (VESS) Method developed by B.C. Ball, R.M.L. Guimarães, T. Batey & L.J. Munkholm.