

The Centre for High Carbon Capture Cropping

How to assess your soil using VESS



1. Using your spade, extract a 30cm x 30cm block of soil that is the full depth of the spade. Place the block on either the ground, tray or preferably a white sheet.



2. Estimate the depth of each soil layer. Some blocks may be uniform throughout the sample. Take a photo with a ruler for scale.



3. Within the layers, break the section open and then break into smaller aggregates. For larger aggregates, use one hand to determine the strength of the aggregate/clod.























4. Assign a score to each layer. Count the number of worms.

5. Assign score using the scale overleaf. To calculate the overall score, you need to calculate the score for each layer. To do this, you multiply the score of each layer by its thickness and then divide that total by the overall depth of the sample. For example: $(\text{Layer score} \times \text{layer depth cm}) / \text{overall sample depth}$. Do this for each layer and then add the totals together to get a final score.

If you would like to find out more about the project, visit our website: carboncapturecropping.com

If you would like to get in contact with us at or sign-up to our e-newsletter, email us at: chcx3@niab.com

Structure quality	Size and appearance of aggregates	Visible porosity and Roots	Appearance after break-up: various soils	Appearance after break-up: same soil different tillage	Distinguishing feature	Appearance and description of natural or reduced fragment of ~ 1.5 cm diameter
Sq1 Friable Aggregates readily crumble with fingers	Mostly < 6 mm after crumbling	Highly porous Roots throughout the soil			 Fine aggregates	 The action of breaking the block is enough to reveal them. Large aggregates are composed of smaller ones, held by roots.
Sq2 Intact Aggregates easy to break with one hand	A mixture of porous, rounded aggregates from 2mm - 7 cm. No clods present	Most aggregates are porous Roots throughout the soil			 High aggregate porosity	 Aggregates when obtained are rounded, very fragile, crumble very easily and are highly porous.
Sq3 Firm Most aggregates break with one hand	A mixture of porous aggregates from 2mm -10 cm; less than 30% are <1 cm. Some angular, non-porous aggregates (clods) may be present	Macropores and cracks present. Porosity and roots both within aggregates.			 Low aggregate porosity	 Aggregate fragments are fairly easy to obtain. They have few visible pores and are rounded. Roots usually grow through the aggregates.
Sq4 Compact Requires considerable effort to break aggregates with one hand	Mostly large > 10 cm and sub-angular non-porous; horizontal/platy also possible; less than 30% are <7 cm	Few macropores and cracks All roots are clustered in macropores and around aggregates			 Distinct macropores	 Aggregate fragments are easy to obtain when soil is wet, in cube shapes which are very sharp-edged and show cracks internally.
Sq5 Very compact Difficult to break up	Mostly large > 10 cm, very few < 7 cm, angular and non-porous	Very low porosity. Macropores may be present. May contain anaerobic zones. Few roots, if any, and restricted to cracks			 Grey-blue colour	 Aggregate fragments are easy to obtain when soil is wet, although considerable force may be needed. No pores or cracks are visible usually.