

step

11

DETERMINING TOPSOIL STRUCTURE

Conducted in the paddock

In this step you will identify Land Classes 1, 2, 3 and 4:

Land Class 1: Land suited to a wide range of uses especially horticulture and cropping. Very high levels of production possible with standard management levels. Land degradation is possible if the land is poorly managed therefore conservation practices are recommended.

Land Class 2: Land suited to a wide range of land uses including horticulture, cropping, grazing and farm forestry. Low risk of land degradation but still requiring high levels of management for production and protection of the land.

You will need:

Property plan
Overlay 1
Red permanent marker
Shovel/auger
Ruler

Land Class 3: Land suited to a wide range of land uses including less intensive horticulture, cropping, grazing and farm forestry. Moderate risk of land degradation requiring very high levels of management such as conservation tillage and maintenance of a vegetative cover on the soil surface.

Land Class 4: Semi-arable land. Land suitable for a range of land uses including occasional cropping, grazing and farm forestry. High risk of land degradation requiring the highest level of management for arable land such as conservation tillage, maintenance of a vegetative cover on the soil surface and surface water control.

Poorly structured topsoils are commonly hardsetting or experience surface crusting. These soils are very hard to penetrate when dry and become boggy quite quickly when wet.

If a soil has responded well to gypsum application, then this soil would be considered poorly structured in its natural state.

Loose topsoils such as sands or sandy loams that are low in organic matter are also referred to as poorly structured and they tend to be prone to wind erosion.



Figure 27 Poorly structured topsoil.



Figure 28 A self-mulching topsoil is referred to as well structured.

Well structured topsoils are characterised by many small aggregates of soil that can resist disturbance by machinery and raindrop impact. These soils are often referred to as self-mulching.



Figure 29 A moderately structured topsoil.

Moderately structured topsoils have many different sized aggregates that resist disturbance in most years by stock, machinery or water, although if over-used at the wrong moisture content, surface crusting can occur.

The structure of the topsoil influences the success of crop establishment, water infiltration, susceptibility to degradation and management of cropping land.

Step 11: Topsoil structure

Try to sample on areas you know have not had gypsum applied. Gypsum improves soil structure, therefore does not give an indication of the natural structure of the soil.

1. Using the same hole as Step 10, determine the structure of the topsoil by referring to the definitions above.
2. If after assessing the topsoil structure, it differs in areas with the same landscape and topsoil depth, draw in another boundary on the plan using the red marker to separate areas of differing topsoil structure.
3. Refer to the landscape code (in black) you wrote on Overlay 1 in Step 9.
4. Refer to the topsoil depth (in blue) you wrote on Overlay 1 in Step 10.
5. Using the combination of landscape and topsoil depth, refer to the appropriate combination below and using the red marker label the plan with the appropriate land class code:

If you have this combination on the overlay:

- D - Dissected rolling rises and plain, hills
s - Less than 10 cm topsoil depth

Write these codes on the plan using the red marker:

- Poorly structured - **4DsP** (dissected landscape, shallow topsoil, poor topsoil structure)
Moderately structured - **4DsM** (dissected landscape, shallow topsoil, moderate topsoil structure)
Well structured - **3Ds** (dissected landscape, shallow topsoil)

If you have this combination on the overlay:

- D - Dissected rolling rises and plain, hills
- d - Greater than 10 cm topsoil depth

Write these codes on the plan using the red marker:

- Poorly structured - **4DF** (dissected landscape, poor topsoil structure)
- Moderately structured - **3DM** (dissected landscape, moderate topsoil structure)
- Well structured - **2D** (dissected landscape)

If you have this combination on the overlay:

- L - Level plain and low rolling plains
- s - Less than 10 cm topsoil depth

Write these codes on the plan using the red marker:

- Poorly structured - **3sP** (shallow topsoil, poor topsoil structure)
- Moderately structured - **2sM** (shallow topsoil, moderate topsoil structure)
- Well structured - **2s** (shallow topsoil)

If you have this combination on the overlay:

- L - Level plain and low rolling plains
- d - Greater than 10 cm topsoil depth

Write these codes on the plan using the red marker:

- Poorly structured - **3P** (poor topsoil structure)
- Moderately structured - **2M** (moderate topsoil structure)
- Well structured - **1**



Figure 30 Step 11: Labelling the topsoil structure on the plan.

Congratulations, you have completed the land classing exercises!

You now have a land class plan of your property. This plan is the first stage of a Whole Farm Plan. You can now start to look at general farm layout and develop alternative layouts that may simplify management of your property, and allow the tailoring of inputs to the various land classes.

For more information or assistance with Whole Farm Planning and Farm\$mart business planning courses contact your local DNRE office.