

Healthy soil on grazing properties

Action Plan template

STEP 1

Map soil types



1a - Assess soil information

A range of land and soil attributes have been mapped across South Australia's agricultural zone. These map layers are available to view for free using NatureMaps and can be a useful resource to learn more about soils on your property.

Open NatureMaps: www.naturemaps.sa.gov.au

Find your farm; it is easiest to type your address into the 'find address or location' search. The physical features (topographic) map is standard background, you can change this to imagery (aerial image). Zoom to show the full extent of your farm.

Overlay the contour layer to recognise landforms. Take time to look at slopes, ridges, valleys, plains and

natural drainage lines and ensure these are marked on your property map.

Use the 'Query' function and for 'Data Source' select "Land Systems"; 'Map Area' select "Current Extent"; then select 'Search'.

A list of the Land Systems that are found on the current extent of the map will be shown. You can hover over these to check they are relevant for your farm. Click the 'Land System Report' to open a pdf file that shows more information for that Land System which includes information on soils.

You can create a new query and look at 'Soils (soil type)' to gain further insight.

Record your findings in this table:

| Location/paddock ref | From mapping data layers | |
|----------------------|--------------------------|------------------------------|
| | Land System | Soil type/s |
| Example: Dam paddock | CLA (Clarendon) | Loam over brown or dark clay |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

Whilst this broad information is good, it is important to take the time to go out in the paddock and dig a hole to take a deeper look.

2b - Physical properties

| Test | Average rating across property from Knowing Your Soils Ute Guide | | | For tests that rated poorly, identify possible causes | | |
|--|--|------|------|--|---|--|
| | Good | Fair | Poor | Soil health | Soil constraint | Management practice |
| Groundcover percentage | | | | <input type="checkbox"/> Lack of plant diversity <input type="checkbox"/> Other: | <input type="checkbox"/> Soil compaction <input type="checkbox"/> Erosion <input type="checkbox"/> Shading <input type="checkbox"/> Other: | <input type="checkbox"/> Grazing management <input type="checkbox"/> Trampling (when wet) <input type="checkbox"/> Soil disturbance <input type="checkbox"/> Tillage <input type="checkbox"/> Other: |
| Weed cover percentage | | | | <input type="checkbox"/> Lack of groundcover <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Soil disturbance <input type="checkbox"/> Other: |
| Leaf colour <i>*confirm if soil or leaf analysis</i> | | | | <input type="checkbox"/> Low organic matter <input type="checkbox"/> Nutrient deficiencies* <input type="checkbox"/> Soil borne pathogens/disease <input type="checkbox"/> Other: | <input type="checkbox"/> Waterlogging <input type="checkbox"/> pH <input type="checkbox"/> Other: | <input type="checkbox"/> Other: |
| Root development | | | | <input type="checkbox"/> Soil-borne pathogens <input type="checkbox"/> Nutrients deficiencies* <input type="checkbox"/> Root-feeding nematodes/insects Other: | <input type="checkbox"/> Soil compaction <input type="checkbox"/> pH <input type="checkbox"/> Poor soil structure <input type="checkbox"/> Other: | <input type="checkbox"/> Loss of topsoil <input type="checkbox"/> Other: |
| Water repellence | | | | <input type="checkbox"/> Resultant from decomposition of organic matter <input type="checkbox"/> Other: | <input type="checkbox"/> Sandy soil natural property <input type="checkbox"/> Other: | <input type="checkbox"/> Other: |
| Topsoil colour | | | | <input type="checkbox"/> Sparse organic litter on soil surface <input type="checkbox"/> Low organic matter <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: |
| Soil compaction | | | | <input type="checkbox"/> Low organic matter <input type="checkbox"/> Other: | <input type="checkbox"/> Soil type <input type="checkbox"/> Wet soil <input type="checkbox"/> Other: | <input type="checkbox"/> Vehicles/equipment movement <input type="checkbox"/> Livestock movement <input type="checkbox"/> Tillage <input type="checkbox"/> Other: |
| Soil slaking at 5cm depth | | | | <input type="checkbox"/> Low organic matter <input type="checkbox"/> Lack of soil macro-organisms (eg earthworms) <input type="checkbox"/> Other: | <input type="checkbox"/> pH - acidity <input type="checkbox"/> Sodic soils <input type="checkbox"/> Soil compaction <input type="checkbox"/> Other: | <input type="checkbox"/> Loss of topsoil <input type="checkbox"/> Tillage <input type="checkbox"/> Other: |
| Soil dispersion at 5cm | | | | <input type="checkbox"/> High salt irrigation water <input type="checkbox"/> Other: | <input type="checkbox"/> Rising groundwater and water tables <input type="checkbox"/> Excess sodium build-up (climatic conditions) <input type="checkbox"/> Other: | <input type="checkbox"/> Other: |
| Soil dispersion at 20cm | | | | <input type="checkbox"/> High salt irrigation water <input type="checkbox"/> Other: | <input type="checkbox"/> Rising groundwater and water tables <input type="checkbox"/> Excess sodium build-up (climatic conditions) <input type="checkbox"/> Other: | <input type="checkbox"/> Other: |
| Water infiltration | | | | <input type="checkbox"/> Surface crusting <input type="checkbox"/> Lack of soil macro-organisms (eg earthworms) <input type="checkbox"/> Other: | <input type="checkbox"/> Naturally high clay content <input type="checkbox"/> Poor soil structure <input type="checkbox"/> Soil compaction <input type="checkbox"/> Other: | <input type="checkbox"/> Loss of topsoil <input type="checkbox"/> Other: |

2c - Chemical properties

| Test | Average rating across property from Knowing Your Soils Ute Guide | | | For tests that rated poorly, identify possible causes | | |
|-------------------|--|------|------|---|---|--------------------------------|
| | Good | Fair | Poor | Soil health | Soil constraint | Management practice |
| Topsoil pH | | | | <input type="checkbox"/> Shallow topsoil <input type="checkbox"/> Low organic matter <input type="checkbox"/> Excess nitrogen accumulation (overload), unused nitrogen <input type="checkbox"/> Other: | <input type="checkbox"/> Poor drainage <input type="checkbox"/> Other: | <input type="checkbox"/> Other |
| Subsoil pH | | | | <input type="checkbox"/> Excess nitrogen accumulation (overload), unused nitrogen <input type="checkbox"/> Other: | <input type="checkbox"/> Poor drainage <input type="checkbox"/> Other: | <input type="checkbox"/> Other |

2d - Biological properties

| Test | Average rating across property from Knowing Your Soils Ute Guide | | | For tests that rated poorly, identify possible causes | | |
|----------------------------|--|------|------|--|--|--|
| | Good | Fair | Poor | Soil health | Soil constraint | Management practice |
| Soil organism count | | | | <input type="checkbox"/> Sparse organic litter on soil surface <input type="checkbox"/> Low organic matter <input type="checkbox"/> Other: | <input type="checkbox"/> Low pH < 5 <input type="checkbox"/> High pH > 8 <input type="checkbox"/> Soil structure - lack of soil spaces and channels <input type="checkbox"/> Other: | <input type="checkbox"/> Insecticide use <input type="checkbox"/> Cumulative chemicals (eg copper) <input type="checkbox"/> Tillage <input type="checkbox"/> Other: |
| Earthworm count | | | | <input type="checkbox"/> Sparse organic litter on soil surface <input type="checkbox"/> Low organic matter <input type="checkbox"/> Other: | <input type="checkbox"/> Low pH < 5 <input type="checkbox"/> High pH > 8 <input type="checkbox"/> Soil structure - lack of soil spaces and channels <input type="checkbox"/> Other: | <input type="checkbox"/> Insecticide use <input type="checkbox"/> Cumulative chemicals (eg copper) <input type="checkbox"/> Tillage <input type="checkbox"/> Other: |

Laboratory analysis of soils can be completed to further fill any gaps in information. See fact sheet – Soil Sampling for Lab Testing: <https://cdn.environment.sa.gov.au/landscape/docs/hf/Soil-sampling-for-labs-fact-sheet.pdf>

It may also be beneficial to seek plant leaf/tissue analysis to assist diagnosis and help identify solutions

to address nutrient deficiencies. See fact sheet – plant sampling for agriculture, a guide: [Fertcare-Plant-Sampling-Guide_reduced.pdf](#)

2e - Map soils

With the above information at hand, map the soils on your property, the more detailed the better.

STEP 3 Know your soil management needs



3a Soil health

Identify soil health concerns and their extent; refer to information collected in the previous step and the 'Care for Soils Guide'.

| | Confirmed | | | | Notes |
|--|--------------------|---------------------|-----|-----|-------|
| | Location / Paddock | Priority to address | | | |
| | | High | Med | Low | |
| Lack of groundcover | | | | | |
| Lack of plant diversity | | | | | |
| Soil disturbance | | | | | |
| Shallow topsoil / loss of topsoil | | | | | |
| Surface crusting | | | | | |
| Low organic matter | | | | | |
| Sparse organic litter on soil surface | | | | | |
| Rising groundwater and water table | | | | | |
| Nutrient deficiencies | | | | | |
| Excessive nutrient accumulation (overload) | | | | | |
| Lack of soil micro-organisms (eg protozoa, bacteria, fungi, etc) | | | | | |
| Lack of soil macro-organisms (eg worms, beetles, etc) | | | | | |
| Presence of soil borne pathogens/disease | | | | | |
| Root feeding nematodes/insects | | | | | |

3b Soil constraints

Identify soil constraints and their extent; refer to information collected at the previous step and the 'Care for Soils Guide'.

| | Confirmed | | | | Notes |
|---------------------------|--------------------|---------------------|-----|-----|-------|
| | Location / Paddock | Priority to address | | | |
| | | High | Med | Low | |
| Soil compaction | | | | | |
| Soil structural stability | | | | | |
| Salinity | | | | | |
| Soil erosion | | | | | |
| Soil acidity | | | | | |
| Non-wetting soils | | | | | |
| Waterlogging | | | | | |

3c Management practices

Identify management practices for improvement and their extent.

| | Confirmed | | | | Notes |
|---|--------------------|---------------------|-----|-----|-------|
| | Location / Paddock | Priority to address | | | |
| | | High | Med | Low | |
| Grazing management | | | | | |
| Tillage | | | | | |
| Livestock/machinery movements | | | | | |
| Fertiliser application/s | | | | | |
| Pesticide, insecticide, fungicide application/s | | | | | |
| Herbicide application/s | | | | | |

Update your property soil map as needed.

STEP 4 Take action to care for your paddocks



Identify management actions that you are already doing, would like to do better, or would like to introduce in the management of your property. Refer to the 'Care for Soils Guide' (page 14-17) for more detail on the possible management actions.

4a Care for soil health

| | List Paddocks | | |
|--|---------------|-------------------------|-------------------------|
| | Already doing | Would like to do better | Would like to implement |
| Rotational grazing | | | |
| Control traffic/livestock | | | |
| Organic inputs | | | |
| Appropriately manage nutrient applications | | | |
| Reduce/remove chemical inputs | | | |
| Mulching | | | |
| Cover cropping | | | |
| Intercropping | | | |
| Increase plant diversity | | | |

4b Manage soil constraints

| | Management action | When to implement | Where (paddock/s) to implement |
|---------------------------|-------------------|-------------------|--------------------------------|
| Soil compaction | | | |
| Soil structural stability | | | |
| Salinity | | | |
| Soil erosion | | | |
| Soil acidity | | | |
| Non-wetting soils | | | |
| Waterlogging | | | |

STEP 5 Monitor your results

What is the desired outcome in caring for soils on your property? The answer to this question will help to determine what you should measure and monitor. Refer to the 'Care for Soils Guide' for ideas.

| What to measure | Where | How to measure | Frequency | Timing | By whom |
|---|--|----------------|-----------|--------|---------|
| What do you need to measure to assess success? | <i>It may not be possible to monitor all areas, select areas that are the highest priority</i> | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Following monitoring and evaluation, review priorities and decide how you need to update your plan and schedule for the following year.