Soil erosion management control options

For primary producers affected by the Yumali bushfire

The Yumali fire affected land across a range of soil types. The dominant land system affected is described as the Sherlock Land System (from DEW Soil Info) and is characterised by flats, with low sandy and stony rises. The main soils are predominantly grey and red sandy loams over calcrete with some shallow soils on stony areas and deeper sands and sand over clays on sandy rises. Some heavier and deeper soils are present in lower flats. The Sherlock Land System changes on the western, eastern and southern areas affected by the fire and in all cases become more sandier with a greater incidence of deep sand and sand over clay.

This document presents the key soil types and the options which may be available to reduce wind erosion within the Yumali fire scar.
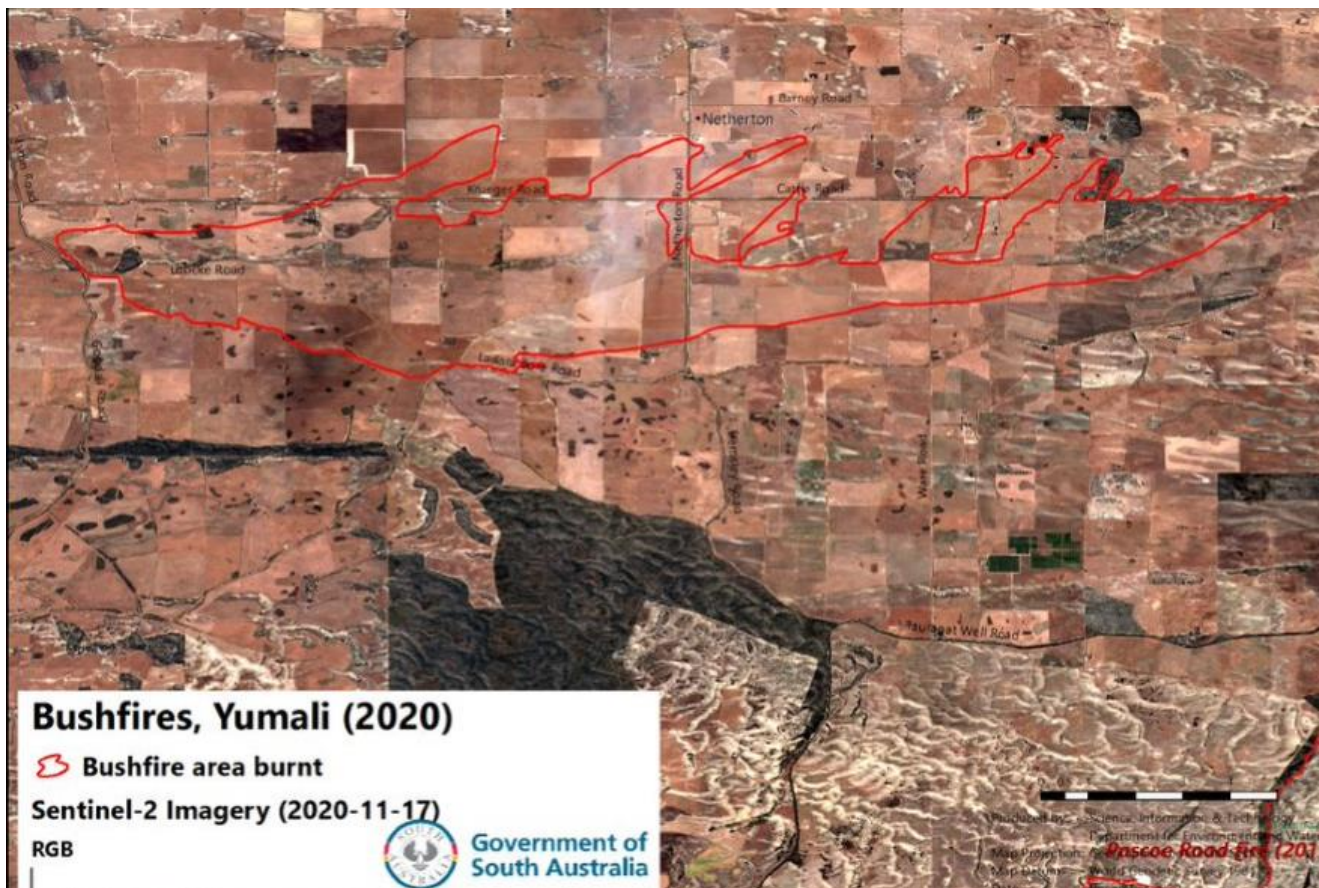

Image 1: Yumali bushfire scar

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Key Soil Types and Options for Erosion Control

Sandy loam over calcrete

Red Sandy Loam over
Calcrete

Brown Sandy Loam over
Calcrete

Grey Sandy Loam over
Calcrete

Image 2: Soil characteristics of a Sandy Loam Over Calcrete – the soil above the calcrete varies in depth, texture and colour.

Management control options for Sandy Loam over Calcrete soils include:

1. Do nothing. Where some cover or crowns of plants persist, it may be best to leave and avoid grazing or vehicle movement. Sometimes sandy loams will develop an armour or crust which has loose material above it which blows around but prevents further soil damage. *See photo below.*

2. Patches where sweeping wind erosion is occurring, consider the use of emergency tillage although this will only work on areas with suitable soil depth and soil strength and may require patching deeper areas out. Suggest trying a few runs first with a cultivator with half the tynes removed and see if you can bring a up clods and avoid bringing up calcrete which will create issues later. Clods need to be around fist sized and avoid any sandier areas as clods will not persist.

3. Topdressing with pig manure would provide cover on bad areas provided manure is lumpy and not too much straw which may blow away. Rates of around 5t/ha have been used.

4. Summer emergency cropping maybe possible if a significant rain event happens on bad areas. (>50 mm, sow immediately leaving ridged surface)

Deep sand

Deep Sand (buried top soil)   Deep Sand over clay and calcrete

Image 3: Soil characteristics of a Deep Sand profile.

Management control options for Deep Sand soils include:

1. Do nothing. Where significant perennial grasses persist (eg veldt and primrose) and crowns have mostly survived the fire, erosion will be reduced and if a rain event happens these areas will self regenerate.

2. If there are small patches where sweeping wind erosion is occurring within a larger paddock which is mostly stable, consider topdressing with pig manure or similar to bring the health of these areas back to a similar level to the rest of paddock.

3. If intending to clay the paddock, consider claying these areas with 100-200t/ha of clay as soon as possible. This will provide protection this year and strengthen the soil. Test clay before application to ensure suitable and modify rate based on clay content.

4. Summer emergency cropping is only an option on areas which have been regularly cropped and maybe possible if a significant rain event happens. (>50 mm, sow immediately with press wheels to pack sand, while sand is wet, to allow sufficient plant growth to achieve cover, under high evaporation conditions post sowing). In pasture areas, you may find enough cover from various seeds and crowns if a rain event occurs.

Sand over clay

| Thick Sand Over Clay | Shallow Low Sand over Clay | Sand over Clay |

Image 4: Soil characteristics of a Sand over Clay profile.

Management control options for Sand Over Clay soils include:

1. Do nothing – where some cover or crowns of plants persist may be best to leave- avoid grazing or vehicle movement. Sometimes shallow sands over clay will develop an armour or crust which has loose material above it which blows around but prevents further soil damage- see photo below. Where significant perennial grasses persist (eg veldt and primrose) and crowns have mostly survived the fire, erosion will be reduced and if a rain events happens these areas will self regenerate.

2. If intending to clay, these areas can be delved or clayspread with 100-200t/ha of clay as soon as possible. Note delving is generally considered much cheaper than claying, but need to ensure clay can be successfully brought to the surface to provide soil protection – will need to patch areas out for delving. Deeper areas of sand (> 50-70cm) may need to be clay spread as well. This will provide protection immediately.

3. The shallow loamy sand shown above could possibly be ripped provided ripping tynes bring some clods of clay to the surface to protect against wind. Remove tynes to give a wider spacing if too much clay is brought to the surface.

4. Summer emergency cropping may be an option on areas which have been regularly cropped and maybe possible if a significant rain event happens (>50 mm and comments as above for sand). In pasture areas may find enough cover from various seeds and crowns if a rain event occurs.

Examples of soil erosion management control methods

Soil armouring/crusting

Sometimes the surface soil will develop an armour or crust which has loose material above it which blows around but prevents further soil damage.

Emergency tillage

May only be successful as a management control on areas with suitable soil depth and soil strength.

Clay spreading

If intending to clay the paddock, consider claying these areas with 100-200t/ha of clay.

Pig manure

Pig manure can be applied at 5-6 t/ha.

More information

Coorong District Council – Yumali fire recovery website: coorong.sa.gov.au (search: bushfire recovery)

You'll find resources and information on:

- Murraylands and Riverland Landscapes SA - Post fire management in broadacre farming
- PIRSA – Emergency measures to curb wind erosion