Protection of agricultural land against erosion in the South Australian Murray-Darling Basin Region

Seasonal Report April 2010

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Department of Water, Land and Biodiversity Conservation

Summary

- Surface cover levels in March 2010 equalled the best surface cover level for March observed over the monitoring period of 2000 – 2010.
- Rain in November and over summer stimulated weed growth and some mechanical fallowing was carried out.
- The proportion of land protected from wind erosion in March 2010 was equal to the highest proportion of protected land in March since monitoring began.
- An early break to the season will generate new plant growth but the risk of erosion on land with inadequate cover and loose soil will continue until this new growth has progressed enough to provide cover.

Seasonal Conditions

The variable weather observed earlier in the growing season continued in November. Eight days of maximum temperatures greater than 35^0C were experienced early in the month followed by a period of wet, cool weather.

A few centres in the region observed highest ever rainfall recordings for the month of November such as Waikerie (90 mm), Nildottie (58 mm) and Swan Reach (54). Several locations recorded monthly totals in the top 10 percent (Decile 10) of all records.

Thunderstorms in February resulted in heavy rainfalls in the Karoonda to Lameroo area with some landholders reporting gaugings of 40 mm. Windy weather caused some soil erosion during February.

Decile 10 monthly rainfalls were widespread across the Murraylands in March.

Soil surface cover levels

November's hot weather led to rapid senescence of crops and pastures and farmers began harvesting earlier than usual. A poor growing season in some areas affected pastures to the extent that some stock were supplementary fed before stubbles became available for feed after harvest.

Farmers in the Renmark – Loxton – Karoonda districts experienced a poor season resulting in low biomass production. This is an area where a number of landholders mechanically fallow land and heavily graze stubbles so there was concern that it would be particularly prone to erosion.

The rainfall in November prompted some farmers to cultivate land.

Rain over summer stimulated growth of weeds and most producers used herbicides to kill weeds and conserve moisture while maintaining surface cover. Mechanically fallowed land in the Karoonda area started to drift after strong winds in February.

More rain in March prompted cultivation of land in the Truro-Eudunda-Burra districts.

The Department of Water, Land and Biodiversity Conservation conducts a Land Condition Monitoring Program which assesses the risk of wind and water erosion on susceptible land in cropping areas four times a year. Surface cover levels and soil disturbance are visually rated during these surveys.

The surface cover rating system used is based on a scale of 1-8 where 1 = full cover and 8 = bare ground.

Assessments in October 2009 showed that surface cover levels then were better than the average October level observed over the monitoring period of 11 years.

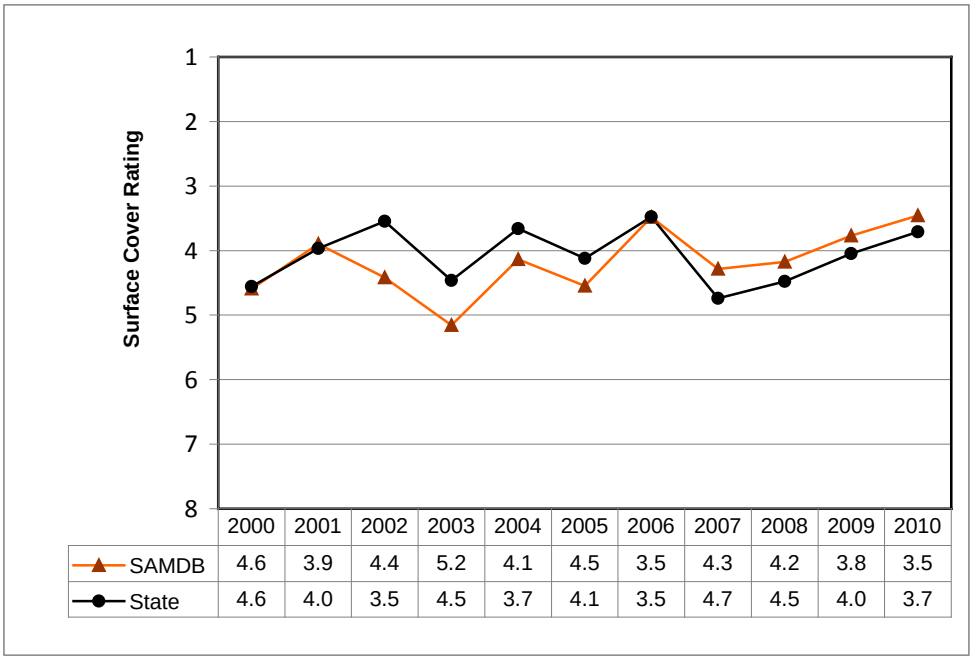
Crop and pasture residues break down naturally over summer, particularly if there is rain that stimulates micro-organisms. Natural breakdown, combined with management practices, reduce surface cover levels. Based on the average change in cover ratings between October and March in previous seasons, it was anticipated that surface cover ratings in March 2010 would not be in the range considered to be at risk of erosion.

Data from the Land Condition Monitoring survey show that the mean surface cover rating in March 2010 was 3.5 (Figure 1). This equals the best March surface cover level recorded since monitoring began. It is outside of the critical rating range for erosion risk (greater than 5), better than the rating of 3.8 in March 2009 and the March average from 2000 to 2010 of 4.2. The change in the surface cover rating of 1.2 units from 2.3 in October 2009 to 3.5 in March 2010 is less than the average change in cover ratings from October to March for the period 2000 to 2010 of 1.5.

Figure 2 shows the change in surface cover in the 13 month period from March 2009 to March 2010.

It is estimated from the Land Condition Monitoring survey that 2% of the region’s land was cultivated at the time of the March observations (first week of March). This is higher than for the same period last year but lower than the mean for March of 9.2% for the period 2000 to 2010.

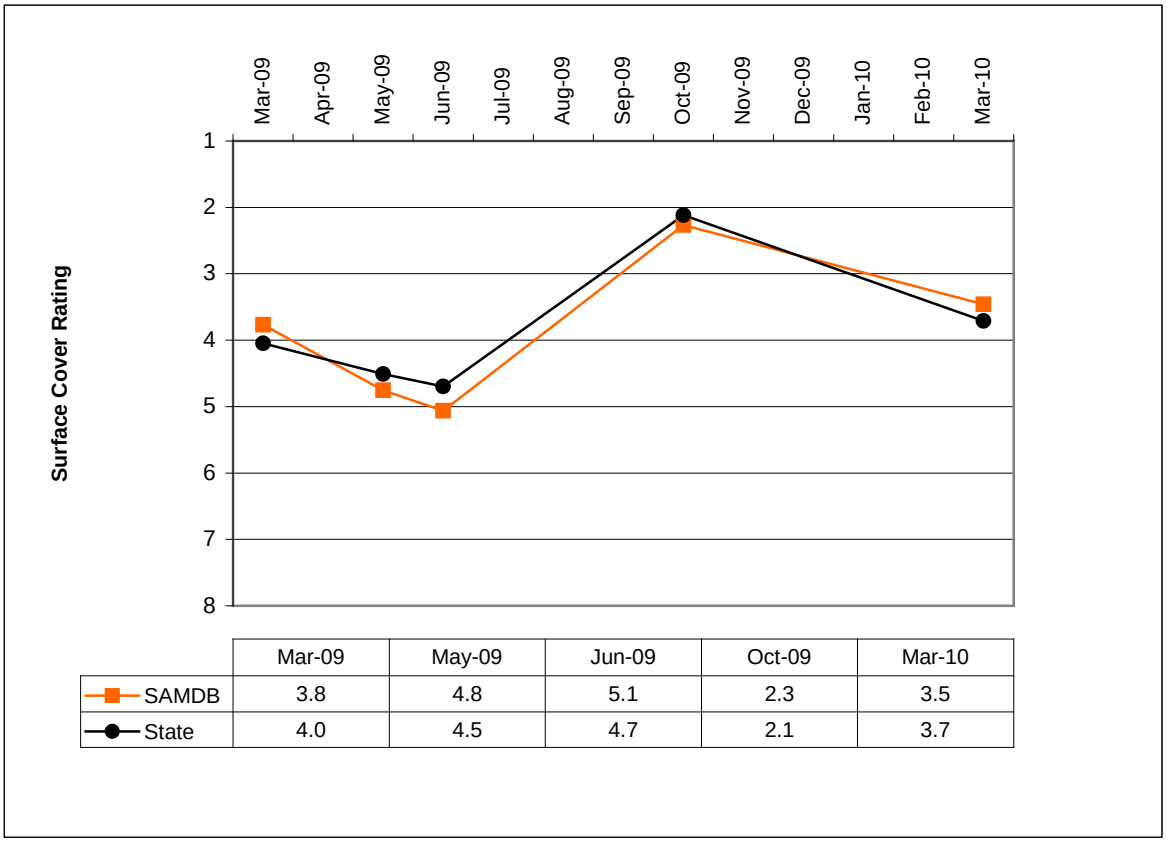
Figure 1: Mean Surface Cover Rating on cleared land in March in the South Australian Murray-Darling Basin Region and South Australia for the period 2000 - 2010



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
SAMDB	4.6	3.9	4.4	5.2	4.1	4.5	3.5	4.3	4.2	3.8	3.5
State	4.6	4.0	3.5	4.5	3.7	4.1	3.5	4.7	4.5	4.0	3.7

Note: Cover rating of 1 = full cover; 8 = bare

Figure 2: Mean Surface Cover Rating on cleared land in South Australian Murray-Darling Basin region and South Australia from March 2009 to March 2010



	Mar-09	May-09	Jun-09	Oct-09	Mar-10
SAMDB	3.8	4.8	5.1	2.3	3.5
State	4.0	4.5	4.7	2.1	3.7

Note: Cover rating of 1 = full cover; 8 = bare

Surface cover will deteriorate more in the next few weeks, increasing the risk of erosion. The length of the risk period will depend to some extent on the timing of break of the season rains that will produce enough plant growth to protect the soil from erosion.

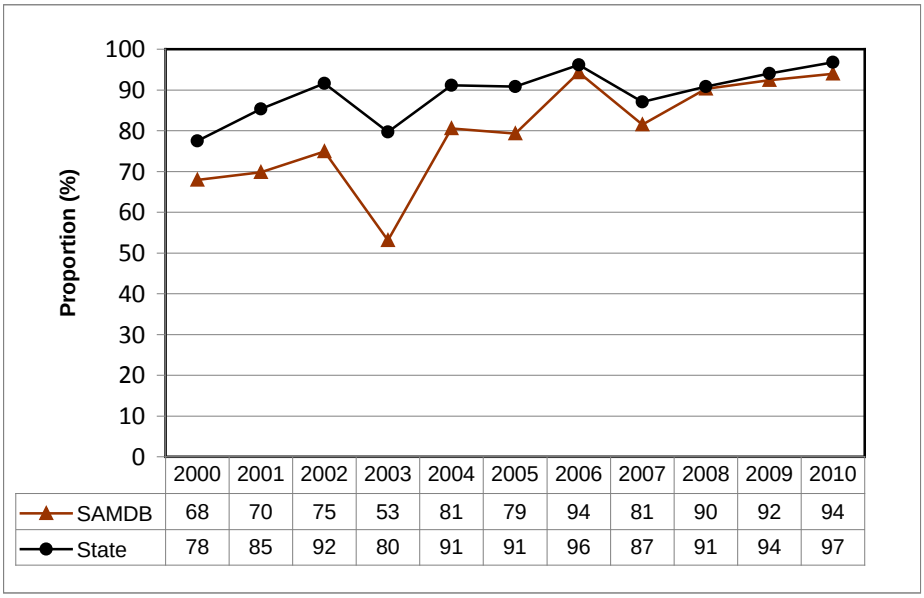
Later opening rains will prolong the period of time that the soil is at risk of erosion as cover levels continue to decline.

Protection of land from wind erosion

The area of cleared land inherently susceptible to wind erosion due to soil type, rainfall and topographic features (Class III_a, IV_a and V_a) is approximately 770,000 ha or 31% of cleared land in the SA Murray-Darling Basin Region. This is mainly found on the sandier soil types of the Murraylands.

In March 2010, 94% of the land was protected from wind erosion, which is the more than March last year and equal to the highest proportion observed over the monitoring period (Figure 3). The average proportion of land protected from wind erosion in March for 2000 – 2010 is 80%.

Figure 3: Proportion of cleared land adequately protected from wind erosion in March in the South Australian Murray-Darling Basin Region and South Australia for the period 2000 - 2010



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
SAMDB	68	70	75	53	81	79	94	81	90	92	94
State	78	85	92	80	91	91	96	87	91	94	97

Protection of land from water erosion

The area of cleared land inherently susceptible to water erosion due to soil type and topography (Class III_e, IV_e and V_e), is approximately 295,000 ha or 11% of cleared land in the SA Murray-Darling Basin Region. It mainly occurs on the eastern slopes of the Mount Lofty Ranges.

This land is mainly used for grazing and no land condition monitoring is undertaken in these areas.

Conclusions

The region generally had good cover levels at the start of summer apart from the Renmark – Loxton – Karoonda areas where a poor season had resulted in low biomass production.

Rainfall over summer germinated summer weeds. Most farmers used herbicides to control weed growth however some land was mechanically fallowed, from as early as November, which means that it has lain almost bare of cover with loose soil for several months. This mechanical fallowing was concentrated in a few districts so while the region overall had an estimated proportion of cultivated land of 2%, this figure would be higher in localised areas such as around Loxton.

Wind erosion was observed near Karoonda in February on fallowed land.

Surface cover levels in March 2010 were slightly better than March 2009 and better than the average cover level for March for the period 2000 – 2010. They equalled the best cover rating for March over the monitoring period. The proportion of cleared land protected from wind erosion in March 2010 was equal to the highest proportion for March since monitoring began.

The later the break of the season, the greater the risk of erosion as surface cover levels decline because of burning, cultivation, grazing and / or natural breakdown. Continued grazing of paddocks could reduce soil surface cover to levels that are inadequate for providing protection against erosion.

This and other reports are available at:
http://www.dwlbc.sa.gov.au/land/monitoring/current_reports.html