Protection of agricultural land against erosion in the Eyre Peninsula Region

Seasonal Report April 2010

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Department of Water, Land and Biodiversity Conservation

Summary

- Despite above average surface cover levels in October 2009, cover levels were equal to the March average for the period 2000 – 2010 in March 2010.
- The proportion of land protected from wind erosion in March 2010 (97%) was equal to the highest proportion for March for the period 2000 – 2010.
- It is possible that surface cover levels will become inadequate to protect soils from erosion if paddock grazing is prolonged or tillage or burning are undertaken before the season breaks.

Seasonal Conditions

Conditions were favourable for plant growth for most of the 2009 growing season, resulting in a high amount of plant biomass. Most of this had reached senescence before unseasonably hot weather occurred in November with more than a week of daily maximum temperatures above 35^0 C.

Electrical storms on the 19th of November caused 21 fires to be ignited by lightning strikes however only a small area of land was burnt.

Strong winds caused wind erosion on poorly covered dry saline land near Ceduna and Cowell. Erosion occurred again in these areas in December and on light textured soils around Warramboo when strong winds accompanied thunderstorms.

Scattered thunderstorms continued in January, February and March with heavy rainfalls being observed on the 7th of March. Run-off in the Cleve and Mangalo districts caused damage to roads and causeways but little erosion occurred on agricultural land. Widespread rains fell across the region on the 19th and 28th of March. Cleve (126 mm), Darke Peak (74 mm), noted highest-ever rainfalls on record for March while Heggaton (60 mm), Kyancutta (49 mm), Lock (67 mm), Tumby Bay (44 mm), Ungarra (60 mm), and Wharminda (78 mm) recorded March falls in their top 10 percent of all March rainfalls on record.

High mice numbers were reported in March causing concern that there is potential for damage to emerging crops and early surface cover.

Soil surface cover levels

The generally good growing conditions earlier in the season resulted in a high bulk of vegetative matter on land at the start of summer except for the Franklin Harbour area which suffered a poor season. Dry saline land near Ceduna also lacked sufficient cover to protect it from erosion on windy days.

Farmers generally reported having good feed supplies on hand in paddocks and storage to carry stock over summer and into autumn. The exception was in the Franklin Harbour area, where producers started supplementary feeding in January because of poor paddock feed.

Scattered thunderstorms over summer stimulated growth of weeds, volunteer cereals and other summer-active plants such as lucerne.

Rainfall from thunderstorms led some farmers to till land, particularly in the eastern Cleve Hills and Mitchellville (north east of Cowell) areas where more than 60% of paddocks were observed to have been mechanically fallowed by the end of March. A smaller proportion of land (< 10%) around Buckleboo was also tilled. In other areas, herbicides were used to kill weed growth and conserve moisture, which has maintained surface cover and left the soil undisturbed

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.

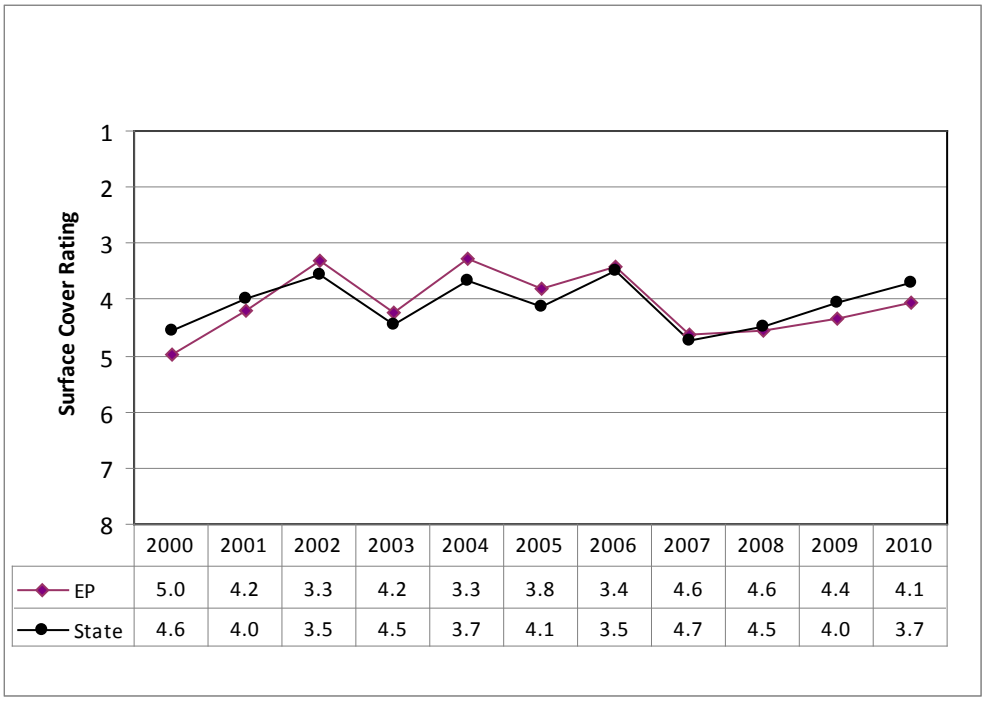
Crop and pasture residues break down naturally over summer, particularly if there is rain that stimulates micro-organisms. Natural breakdown, combined with management practices, reduce surface cover levels. Based on the average change in cover ratings between October and March in previous seasons, it 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 4.1 (Figure 1). This is outside of the critical rating range for erosion risk (greater than 5) and better than the rating of 4.4 in March 2009 and equivalent to the March average from 2000 to 2010 of 4.1. The change in the surface cover rating of 1.9 units from 2.2 in October 2009 to 4.1 in March 2010 is greater than the average change in cover ratings from October to March for the period 2000 to 2010 of 1.4.

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 less than 1% of the region's land was cultivated at the time of the March observations (first week in March). This is lower than the mean for March of 4% for the period 2000 to 2010.

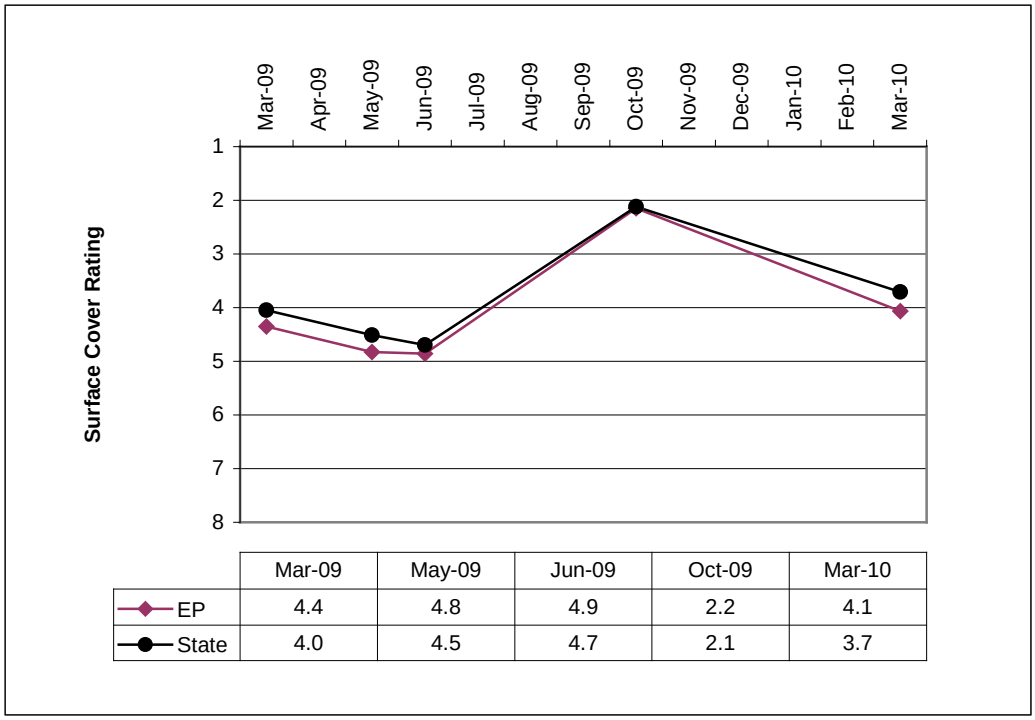
Figure 1: Mean Surface Cover Rating on cleared land in March in the Eyre Peninsula Region and South Australia for the period 2000 - 2010



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
EP	5.0	4.2	3.3	4.2	3.3	3.8	3.4	4.6	4.6	4.4	4.1
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 Eyre Peninsula region and South Australia from March 2009 to March 2010



	Mar-09	May-09	Jun-09	Oct-09	Mar-10
EP	4.4	4.8	4.9	2.2	4.1
State	4.0	4.5	4.7	2.1	3.7

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

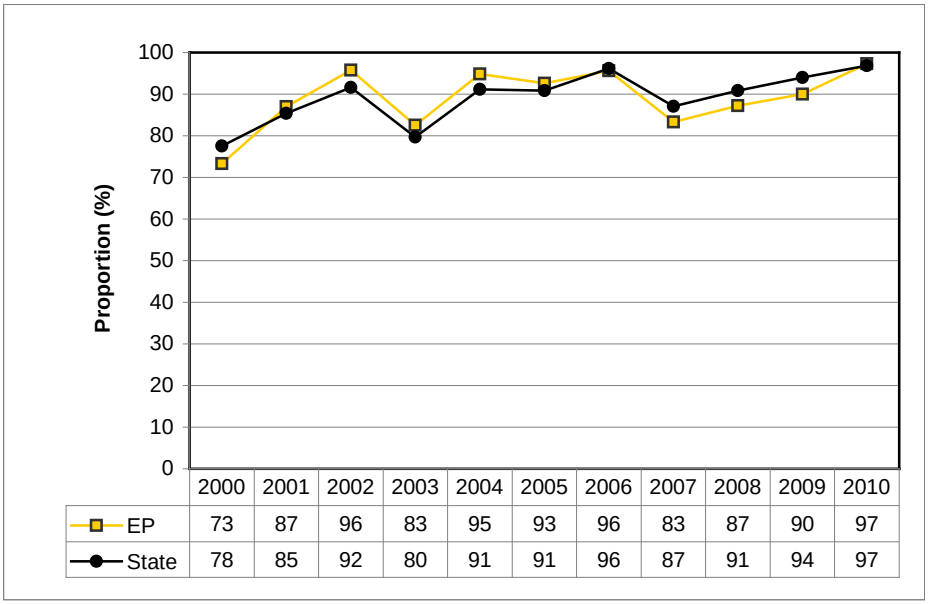
Surface cover will deteriorate more in the next few weeks, increasing the risk of erosion. The length of the risk period will depend to some extent on the timing of break of the season rains that will produce enough plant growth to protect the soil from erosion. Later opening rains will prolong the period 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 784,000 ha or 28% of cleared land on Eyre Peninsula. This is mainly found on the sandier soil types of Western, Central and Eastern Eyre Peninsula.

The proportion of land protected from wind erosion in March is higher than at the same time in 2009 and at 97%, above the March average of 89% for the monitoring period (Figure 3).

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



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
EP	73	87	96	83	95	93	96	83	87	90	97
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 226,000 ha or 8% of cleared land on Eyre Peninsula. It mainly occurs on the hilly land of Lower Eyre Peninsula.

The proportion of area of land protected from water erosion in March 2010 is at 100% which is near the average for the period 2000 to 2010 (Table 1).

Table 1: Proportion of cleared land (%) protected from water erosion in March on Eyre Peninsula and South Australia for the period 2000 – 2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Ave
EP	93	95	99	99	100	98	99	98	99	99	100	98
State	95	96	99	98	99	98	99	95	97	99	99	98

Practices that will reduce soil cover levels or disturb soil before seeding are burning, over-grazing or tillage. If these practices are to be undertaken, delaying them as long as possible will reduce the period of erosion risk.

Conclusions

Good growing conditions led to above average October cover levels in October 2009 however by March 2010 they had dropped to the average March 2000 - 2010 surface cover levels. This is probably due to the fact surface cover ratings on wind erosion prone soils are based on the height of cover, a critical factor in wind erosion protection, and the height of cover in March was about the same as in previous years.

The exception to this was land around Franklin Harbour which experienced a poor growing season in 2009, leading to erosion problems on dry saline land during the year. A lack of biomass production resulted in poor soil surface cover, and producers in the area turned to supplementary feeding or agistment of stock midway through the summer months.

Scattered summer thunderstorms over the region stimulated growth of weeds, volunteer cereals and summer active perennial plants such as lucerne. The rain also led to significant areas of land being tilled in the eastern Cleve Hills and north-east of Cowell. However, over the whole region, the area of land mechanically fallowed in early March was estimated to be less than 1% of the total area of agricultural land.

The proportion of cleared land protected from wind erosion has improved from March 2009, and at 97%, equals the highest proportion of land protected for the monitoring period 2000 – 2010. The proportion of cleared land protected from water erosion is at 100%.

Surface cover levels will continue to decline until the break of season rains generate new growth. Grazing of paddocks, burning and natural breakdown of residues could reduce soil surface cover to levels that are inadequate for providing protection against erosion. There is also a possibility that high mice numbers will further reduce surface cover or cause farmers to burn residues in order to lower mice numbers. The longer the period to the opening rains, the greater the risk is that erosion will occur once surface cover becomes inadequate to provide protection against erosion.

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