



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

Seasonal Report November 2010

Issued by:

Department of Environment and Natural Resources

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Summary

- Early rains and warm temperatures resulted in early pasture growth and early crop sowing.
- Surface cover levels in October were similar to those of October 2009 and better than the mean for 2000 to 2010.
- Given the average rate of surface cover breakdown and losses over summer in the region, cover levels are not expected to fall below the level regarded as adequate for erosion protection by March 2011.
- This season will have higher amounts of stubble remaining from good crops in most areas, and a number of pastures spray-topped or hay frozen. Stock management over summer will be important in maintaining surface cover. Mice are a potential problem, and some farmers may try to reduce feed for mice by tillage or burning. Locusts are also a potential problem, depending on how much feed is available over summer.

Seasonal Conditions

Rainfall deciles for the period May to October 2010 show that most of the SA Murray-Darling Basin Region received above average to average rainfall during the growing season this year (Figure 1).

Late rain in March was followed up by good rains in April with most centres recording above average rainfalls for the month. Temperatures remained warm allowing good plant growth. Some areas in the region were affected by locusts moving in from the rangelands. Early sown crops in some areas were eaten. Mice were also a problem in some areas early in the season.

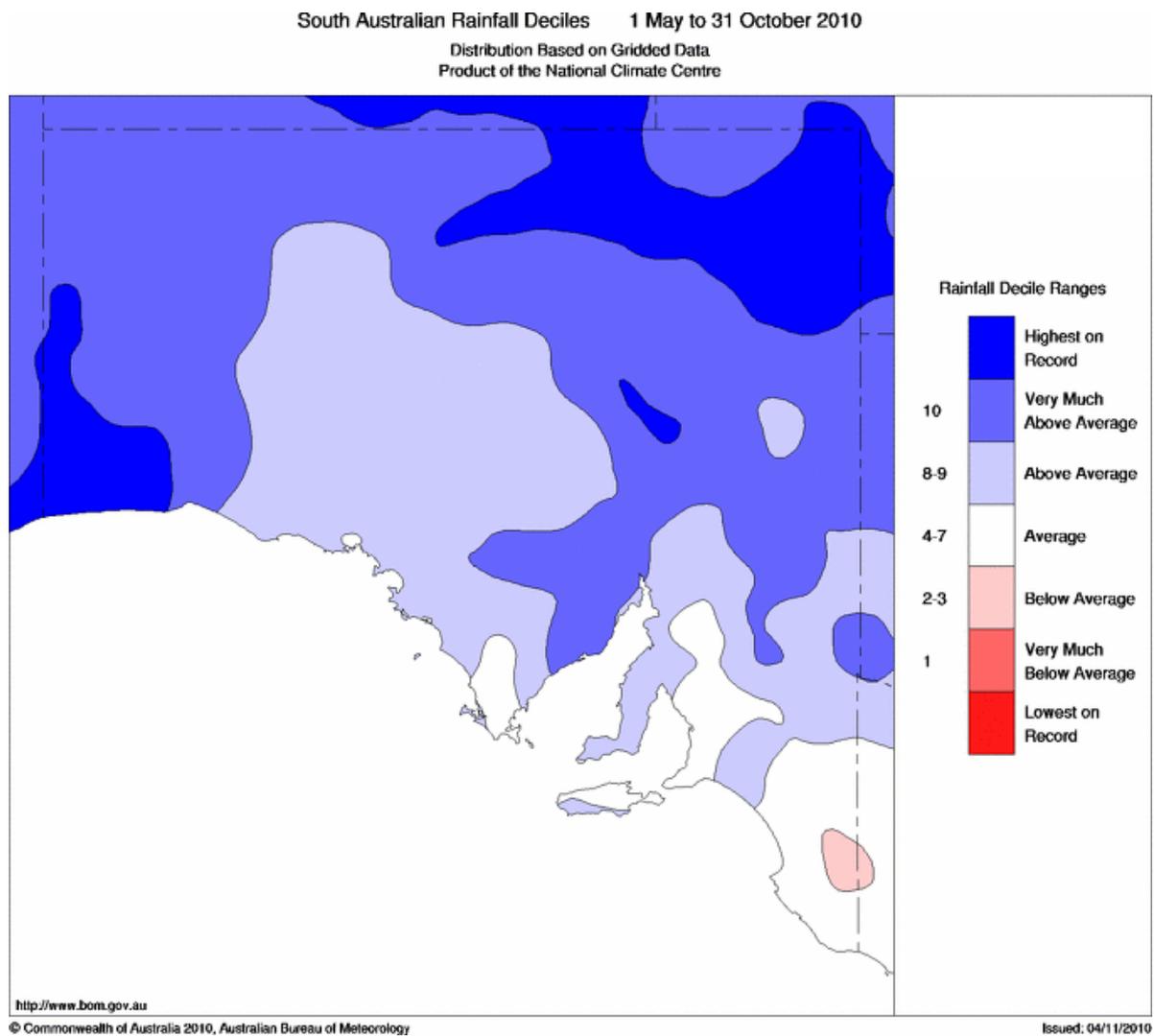
A dry spell in early May slowed crop planting, but good rains in late May enabled farmers to finish. Some areas used tillage for weed control, with these areas at risk of wind erosion. Locust activity slowed with cooler weather however egg beds were found in a number of districts.

Rain throughout June and July was light but ongoing, enabling crops to establish well. Areas around Pinnaroo continued to have problems with mice.

August and September had above average rainfall, and some heavy falls caused minor water erosion in the Eastern Mt Lofty ranges, and minor flooding in the Langhorne Creek area. Temperatures were below average, but crop growth was good and ground cover high.

October conditions remained cool. A dry spell in early October put some crops under stress but late rains enabled them to recover. Locusts were hatching in the region and control measures were undertaken by farmers and PIRSA.

Figure 1:



Cumulative growing season rainfall data for selected sites across the SA Murray-Darling Basin Region are shown in Appendix 1.

Soil surface cover levels

The Department of Environment and Natural Resources conducts a Land Condition Monitoring Program that assesses the risk of wind and water erosion on susceptible land in the 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.

The early season break had many farmers in the northern Mallee using tillage to control summer weeds. Some crops were planted early, however locust activity damaged some of these crops as they emerged. Mouse activity was also a problem around Pinnaroo. Early cultivated paddocks were at risk of wind erosion; however rapid growth of pastures and early crops meant that they were not at risk for a long period.

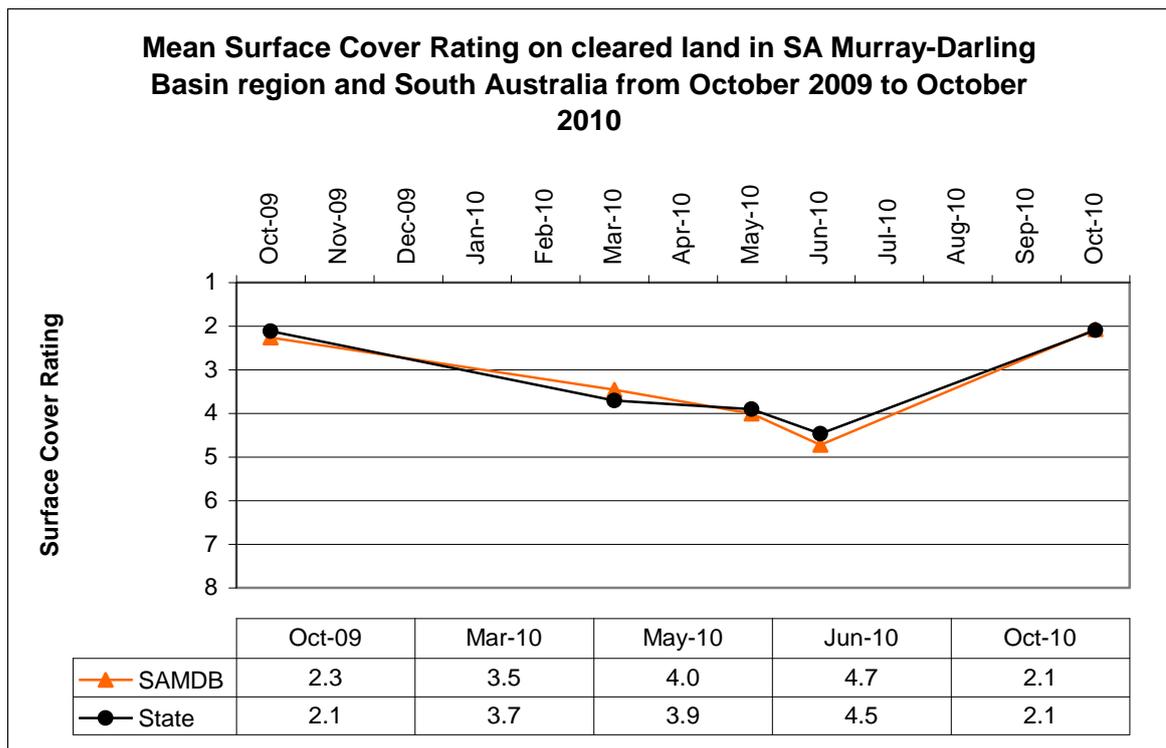
Pasture growth was excellent in most areas and supply often outstripped demand. A number of paddocks were spray-topped or hay-frozen in spring to control weeds and perhaps conserve fodder for summer. Hay making was also undertaken in many areas. Some hay paddocks were grazed after the hay was removed; these paddocks had low cover levels in late spring.

Appendix 2 provides estimated pasture growth in kilograms per hectare per day for district councils within the SA Murray-Darling Basin Region during the growing season. These estimates are derived using remote sensing of plant biomass combined with climate and soil data, and are available from the CSIRO's "Pastures From Space" program. The early break to the season while soil temperatures were still warm is seen with early pasture growth in March and April. Cold temperatures through winter slowed growth. Rain through to November extended the pasture growing season beyond the usual time.

Figure 2 shows how surface cover ratings changed over the 13 months to October 2010.

The average surface cover rating in October this year was 2.1 which is close to the level in October 2009.

Figure 2:

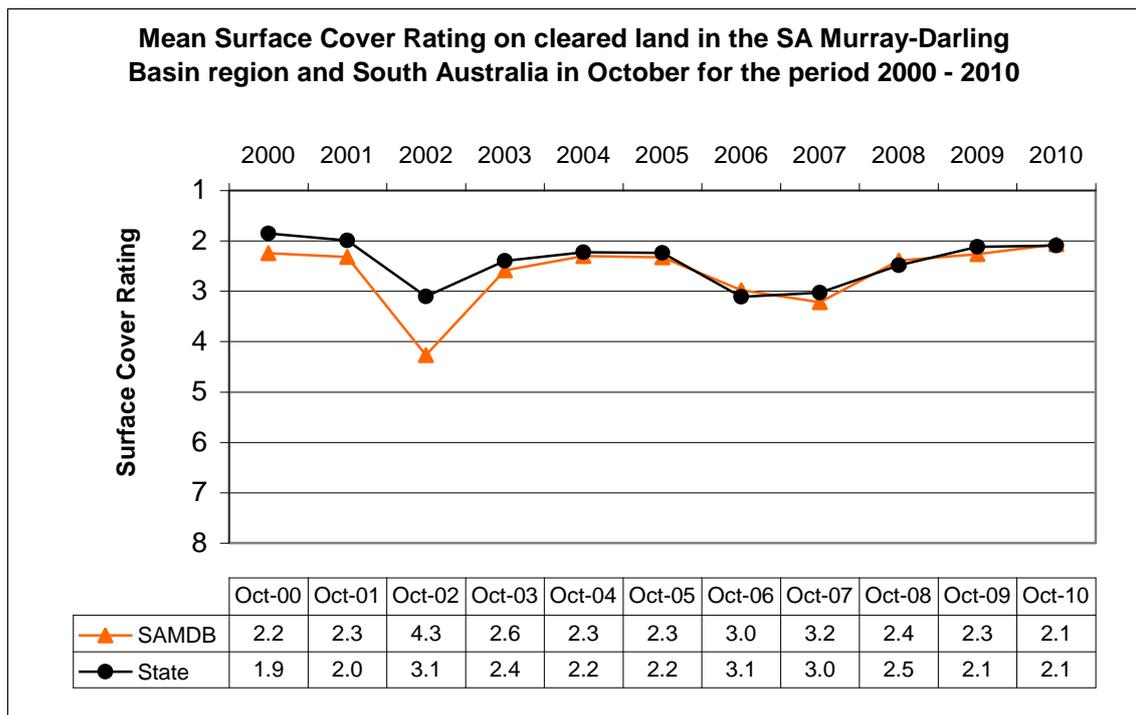


Note: Cover rating of 1 = full cover; 8 = bare

Surface cover is usually at its maximum in October. Cover levels in spring decline over summer and into autumn as plant residues break down. Grazing reduces cover levels further. The average change in cover rating between October and March in the South Australian Murray-Darling region is 1.5 since monitoring began. If this change occurs this summer, the average cover rating in the region in March 2010 is likely to be around 3.6, less than the critical rating of 5.0, above which land is considered to be at risk of erosion.

The trend in soil surface cover levels in October since 2000 is shown in Figure 3. Surface cover in the South Australian Murray-Darling Basin Region in October this year is better than the average rating for October of 2.6 since monitoring began.

Figure 3:



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

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 710,000 ha or 32% of cleared land in the SA Murray-Darling Basin region. This is mainly found on the sandier soil types of the Murraylands.

The proportion of land protected from wind erosion in October 2010 was 100% which is equal to October 2009 and better than the average from 2000 to 2010 of 96%.

At this time of the year, the main erosion risk is associated with lack of surface cover as there is little soil disturbance due to tillage.

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 early break to the season allowed crops and pastures to get away early. Cover was well established by the time cold weather arrived, and this cover was maintained and increased through spring.

Surface cover levels in October were better than the average for October for 2000 to 2010. Given the average rate of breakdown and losses over summer, surface cover levels should be adequate for erosion protection in March.

The proportion of land protected from wind erosion is at the maximum level, which is to be expected in October when crops and pastures reach maturity.

At this time of the year, the main erosion risk is associated with lack of surface cover as there is little soil disturbance due to tillage. However, some tillage was used for weed control in the northern Mallee last summer and this significantly increased the risk of wind erosion over a period of several months on this land. This could be repeated this summer.

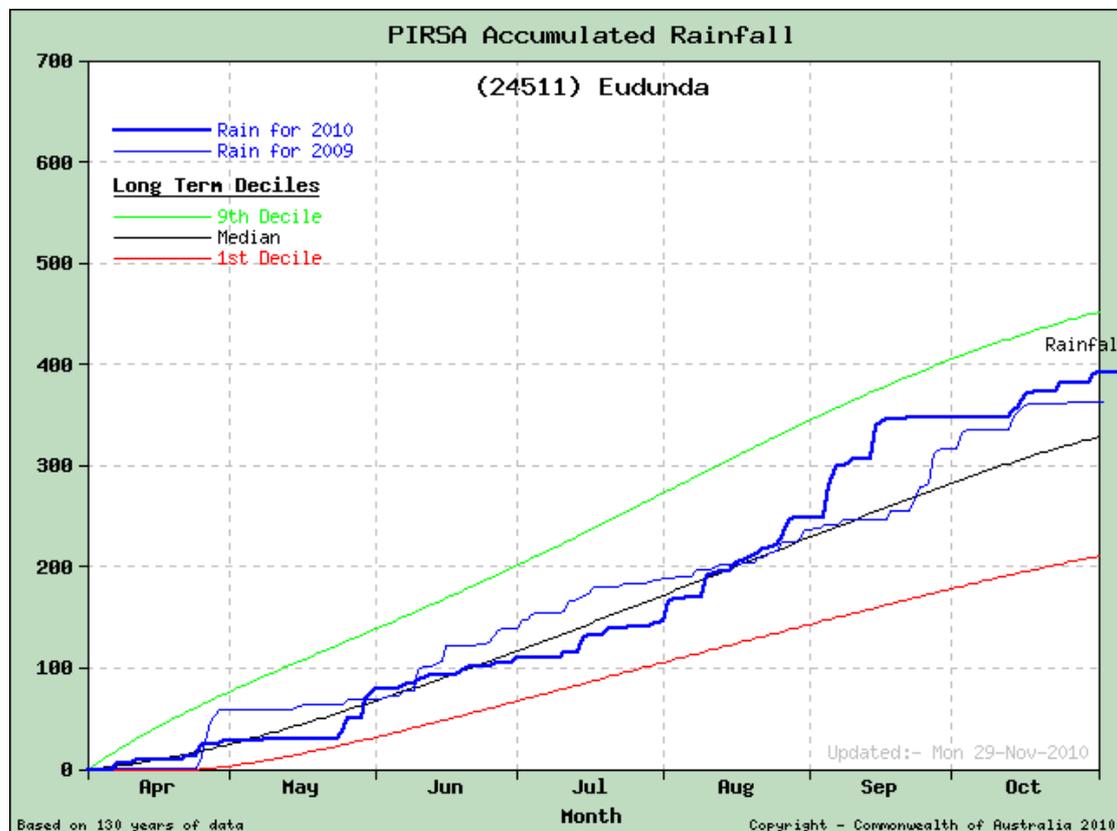
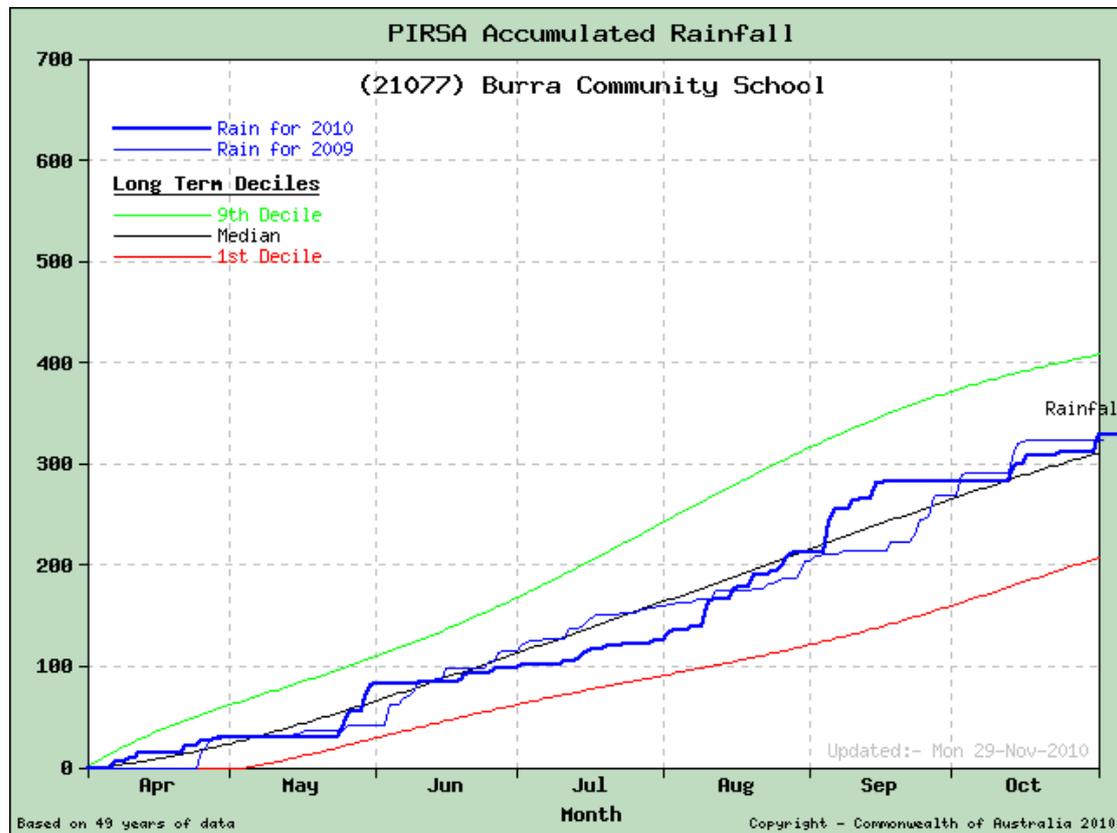
Soil surface cover levels will decline as the plant residues break down naturally and are grazed. Tillage can also reduce cover levels as most tillage implements tend to break up and / or bury plant residues.

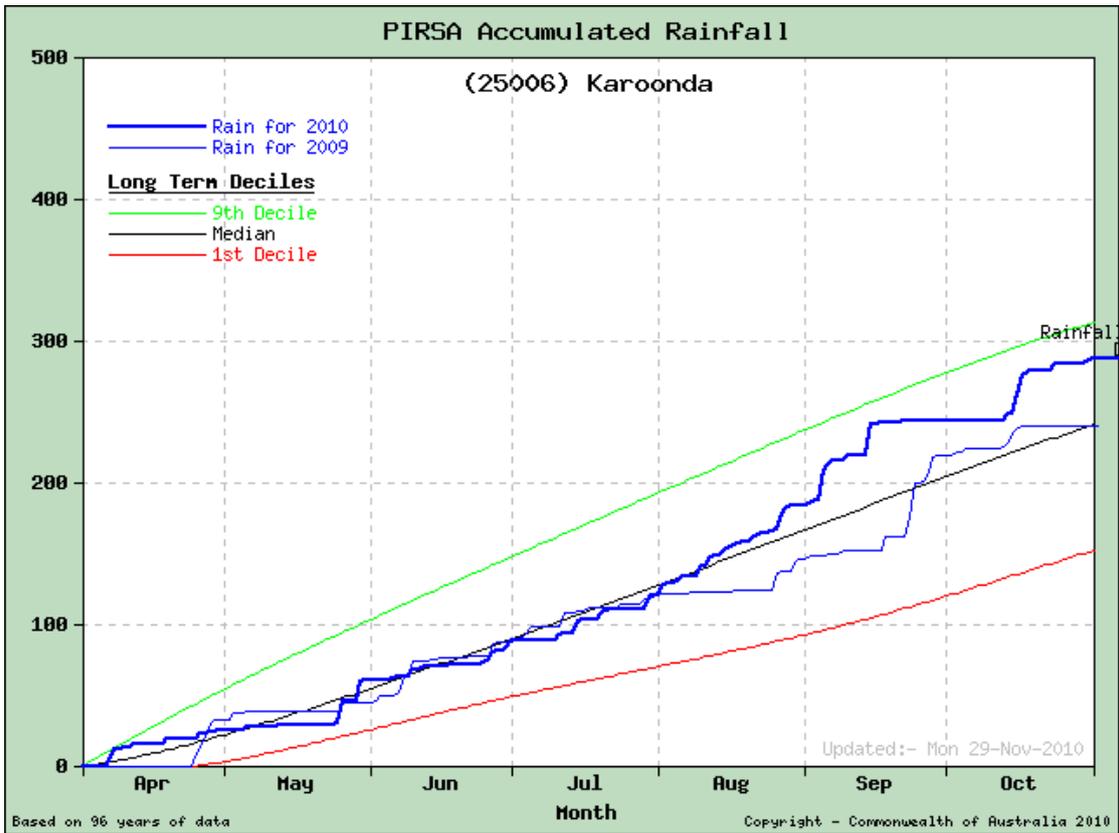
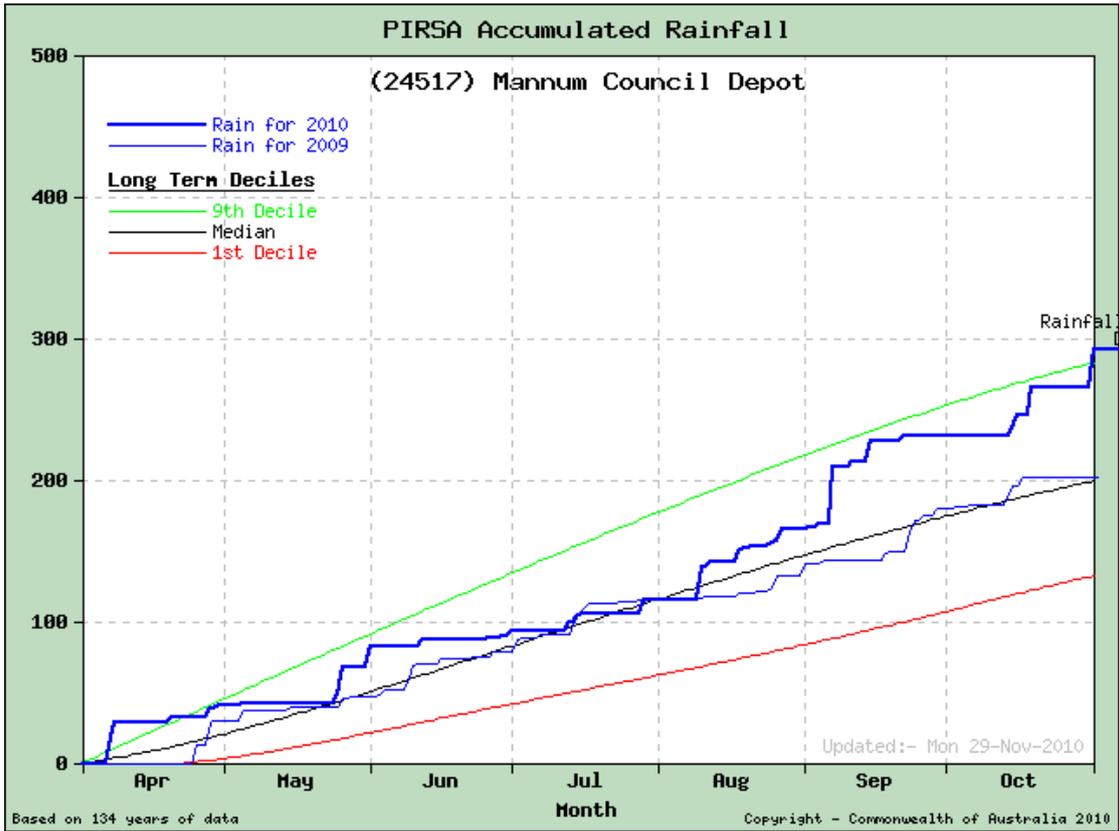
Producers' management of livestock grazing is critical in maintaining adequate levels of surface cover over summer and into autumn. Cultivating land as close as practical to or at seeding time will leave cover on the soil surface for a longer period of time. Summer rains can stimulate plant growth leading to better cover of the soil however soil moisture retention and weed control is achieved by killing off this growth. Using herbicides rather than tillage to do this will be better for retaining surface cover. Where summer plant growth is grazed, attention will still have to be paid to maintaining adequate surface cover.

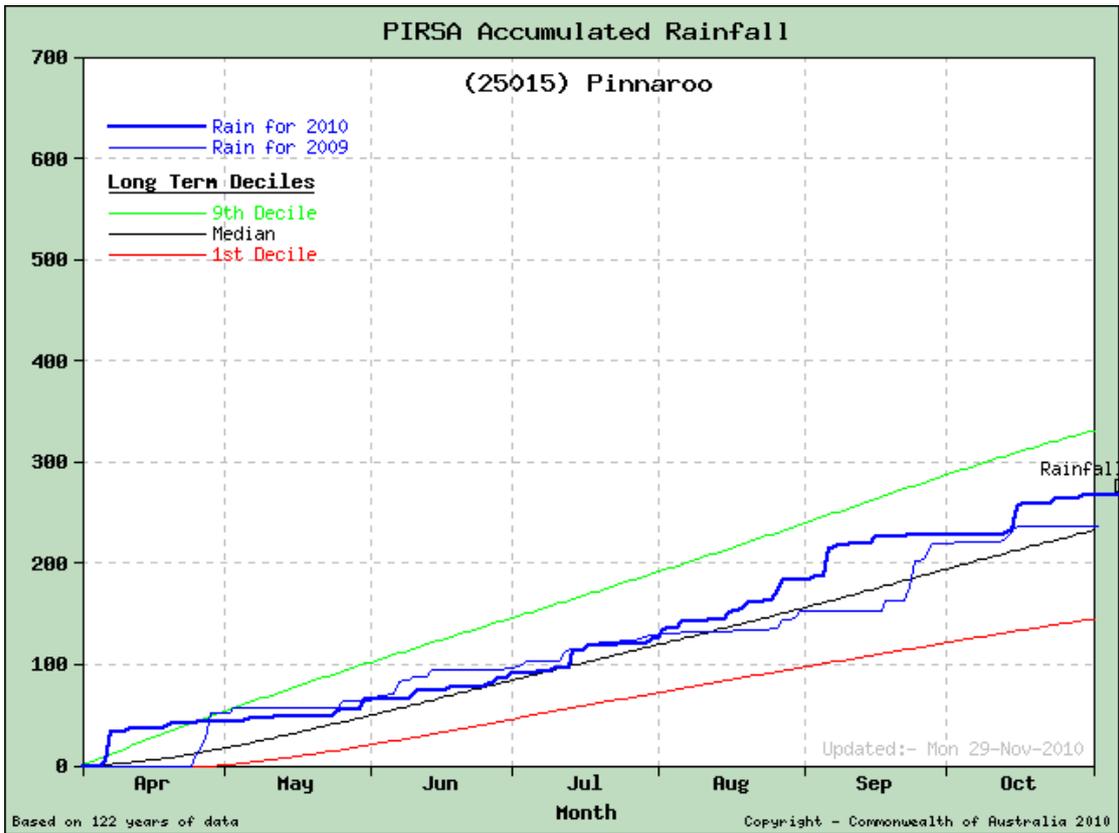
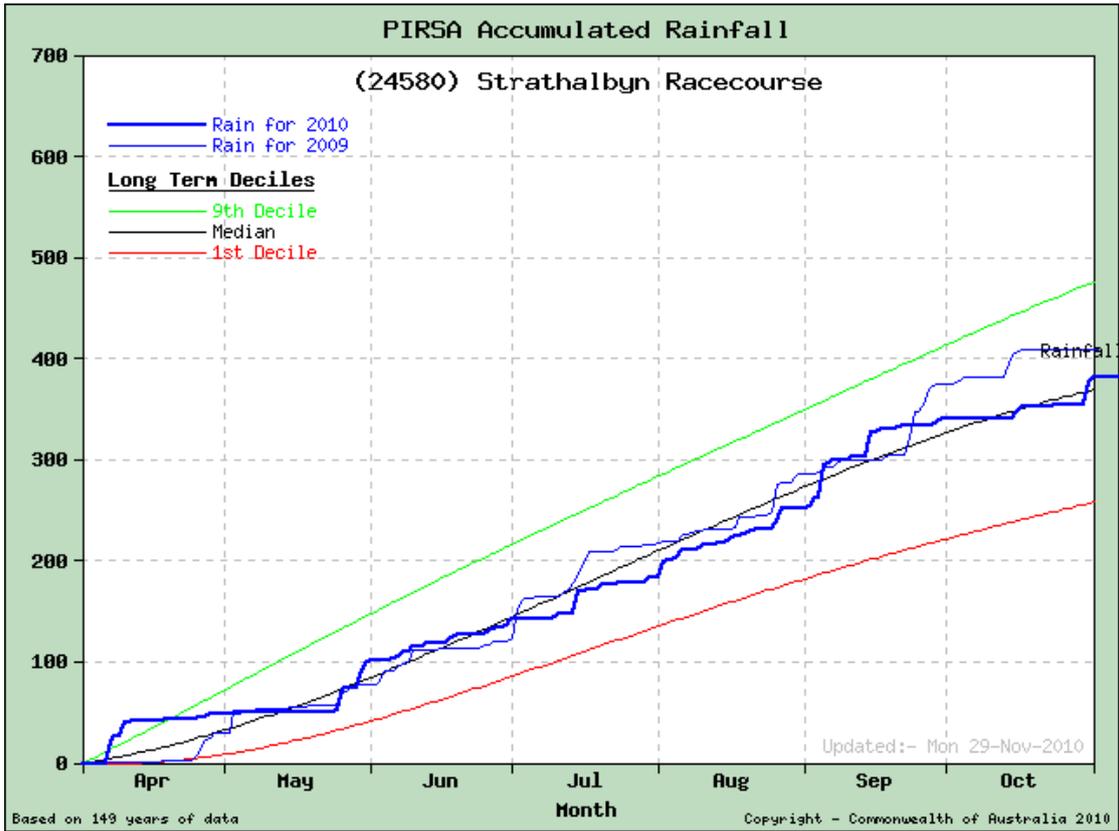
It is possible that producers will look to reduce the bulk of residues in paddocks to avoid problems with residues at seeding time. Mice problems are usually associated with high carryover of crop and pasture residues so farmers might also look to use tillage and burning to reduce mice numbers. Should surface cover levels be reduced to below that regarded as being adequate for erosion protection, erosion could occur.

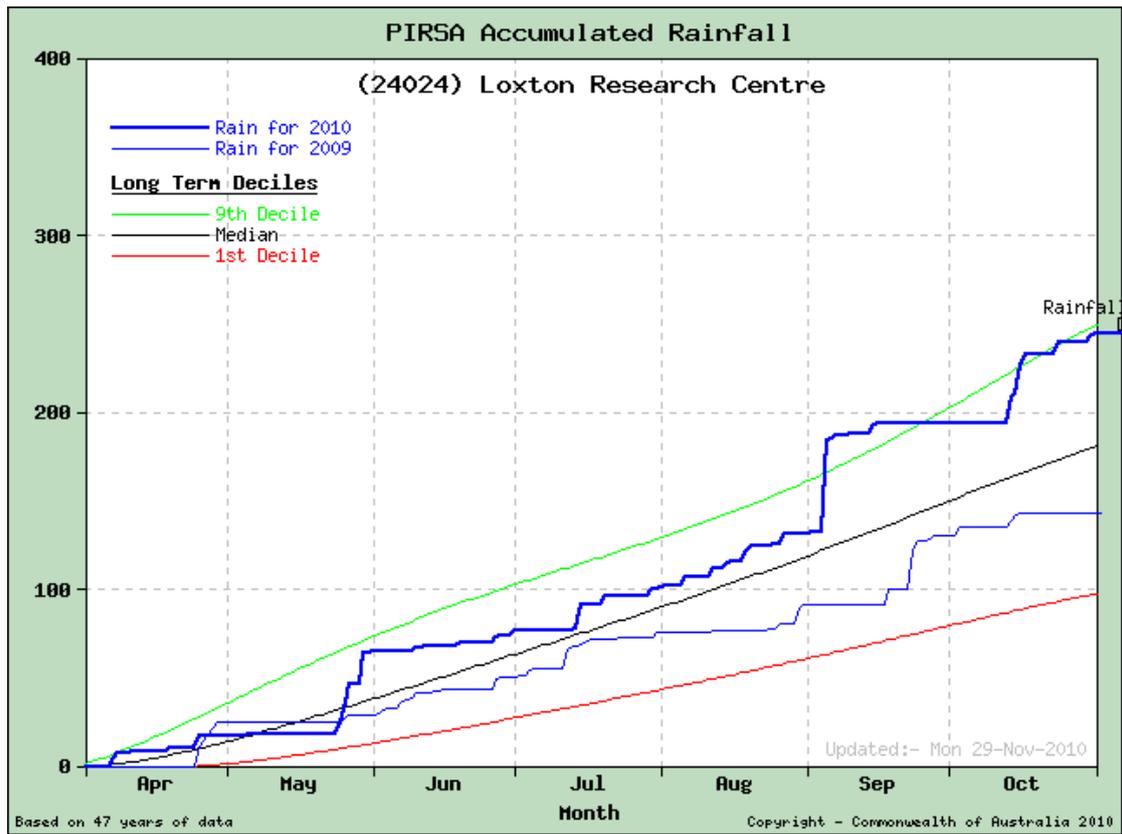
Appendix 1

Cumulative rainfall data for selected sites across the SA Murray-Darling Basin Region
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Appendix 2

Estimated Pasture Growth Rates (kg/ha/day) during growing season for district council areas within the SA Murray-Darling Basin Region, 2010.
CSIRO Pastures from Space Program (www.pasturesfromspace.csiro.au)

