



Protection of agricultural land against erosion in the South East Region

Seasonal Report November 2010

Issued by:

Department of Environment and Natural Resources

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Summary

- Early favourable growing conditions resulted in good growth of crops and pastures providing sufficient soil surface cover leading into summer.
- Surface cover levels in October were equal to those of October 2009 and close to 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 saw a reduction of crop area and an increase in stock numbers in the region so grazing management will play a greater role in maintaining surface cover levels. However, overall erosion risk might be less because of the reduction in soil disturbance by tillage.

Seasonal Conditions

Rainfall deciles for the period May to October 2010 show that most of the South East Region received below average to average rainfall during the growing season this year (Figure 1).

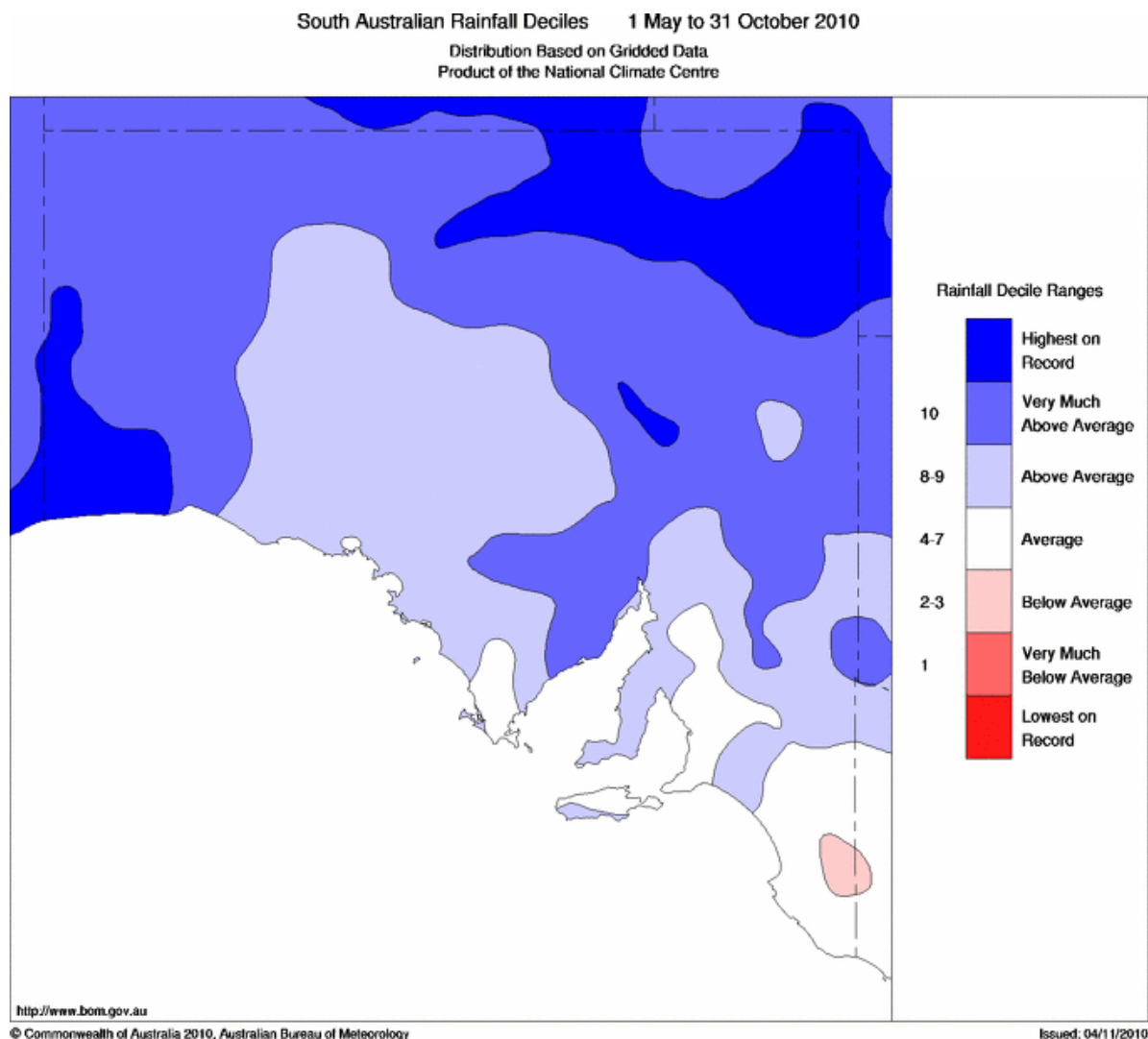
Late rain in March was followed up by good rains in April with most centres recording above average rainfalls for the month. Rainy conditions were interspersed with warm sunny days and temperatures varied from warm to cool depending on cloud cover.

Cloudy and rainy conditions prevailed in May but rain was light and below average to average falls were measured. Temperatures were cool to cold. Below average rainfall and cold conditions continued through to July with Tintinara, Lucindale and Kingston recording Decile 1 observations in July (amongst the lowest ten percent of observations on record).

Above average rainfalls were observed in August and Bordertown, Coonalypyn, Keith, Tintinara, Lucindale, Beachport, Frances and Mt Gambier recorded Decile 10 measurements. Waterlogging was noted on poorly drained soils and areas of land with shallow watertables. Temperatures were still cold and below average.

The wet conditions continued into September with creeks and drainage lines overflowing and waterlogging occurring. Rainfalls in October were below average to average and mild to warm temperatures were observed.

Figure 1:



Cumulative growing season rainfall data for selected sites across the South East 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.

Significant burning of stubbles occurred in April and mice activity was noted over a large area. Warm conditions and soil moisture stimulated abundant plant growth. The early break to the season initiated seeding preparations on cropping paddocks.

While cold conditions and reduced rainfall slowed growth in May and June, plant growth from the start of the season maintained high levels of feed for stock. Stock numbers have increased in the region this year and less area was cropped compared to previous years.

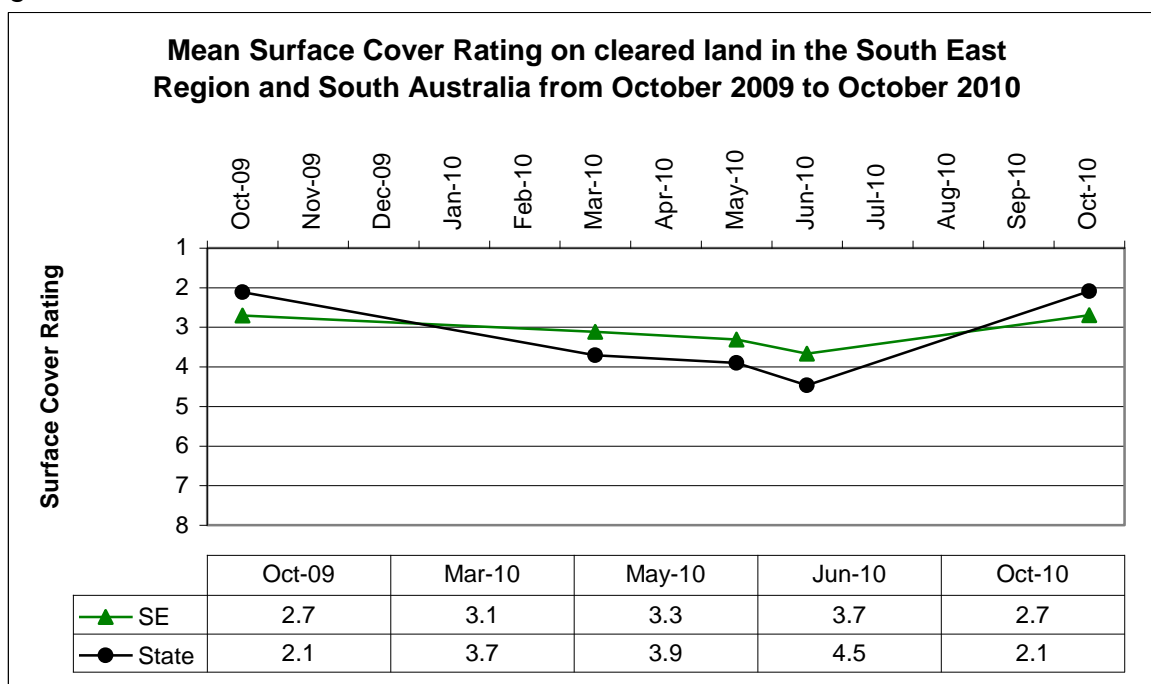
Waterlogging and cold, wet conditions in August and September affected plant growth in some areas but by October, good growth of crops and pastures was evident. Producers were looking to run more stock to take advantage of the abundant feed.

Appendix 2 provides estimated pasture growth in kilograms per hectare per day for district councils within the South East 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 effect of warmer temperatures and early seasonal rain on plant growth in autumn is evident.

Figure 2 shows how surface cover ratings changed over the 13 months to October 2010. Surface cover levels were at their poorest in June however after crops and pastures germinated and grew, cover was re-established.

The average surface cover in October this year was 2.7 which equals the level in October 2009.

Figure 2:

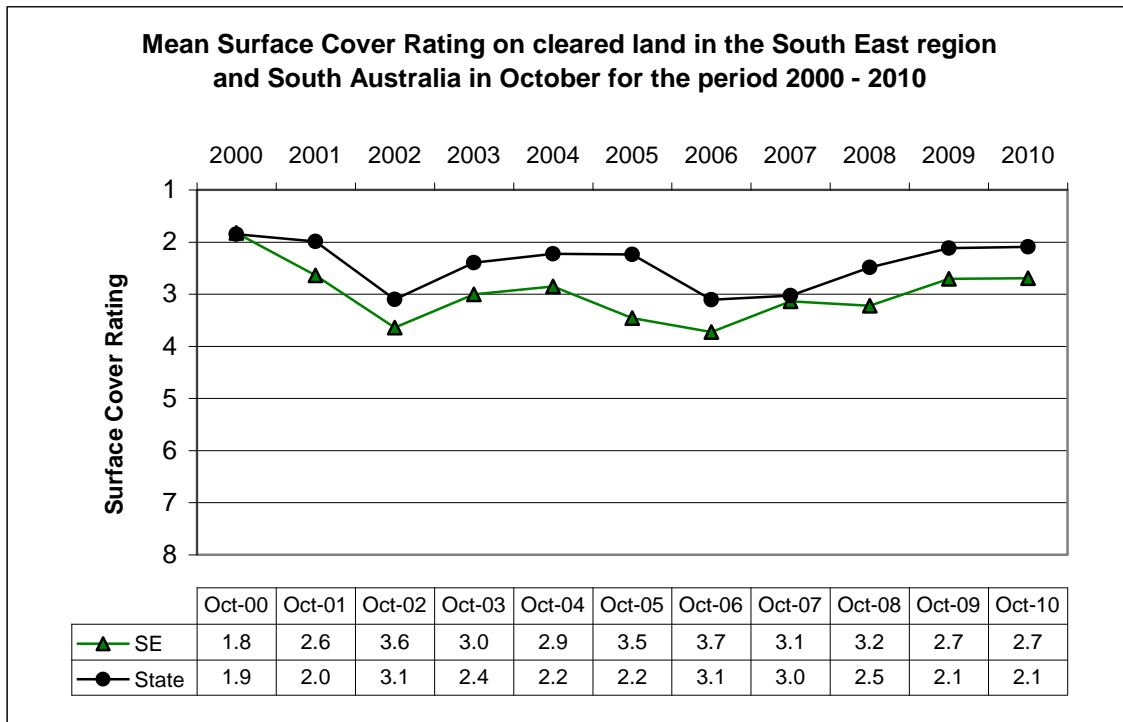


Note: Cover rating of 1 = full cover; 8 = bare

Surface cover is usually at its maximum in the region in October to November. Cover levels decline over summer and into autumn as plant residues break down. Grazing

reduces cover levels further. The average change in Surface Cover Rating between October and March in the South East Region since monitoring began is 0.7. If this change occurs over this summer, the average cover rating in the region in March 2011 is likely to be around 3.4, less than the critical rating of 5.0, above which land is considered to be at risk of erosion.

Figure 3:



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

The trend in soil surface cover levels in the South East Region in October since 2000 is shown in Figure 3. Surface cover in October this year was the same as in October 2009 and close to the average rating of 3.0 since monitoring began.

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 540,000 ha or 25% of cleared land in the South East NRM Region. This is mainly found on the sandier soil types on the Upper South East.

The proportion of land protected from wind erosion in October 2010 was 100%.

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.

Conclusions

Early rain and warm temperatures stimulated abundant plant growth at the start of the season. This growth provided surface cover in winter when cold, drier weather

set in. Wet, cold conditions and waterlogging prevailed in August and September but by October, good growth of crops and pastures was evident.

Surface cover levels in October were close to the mean 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.

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.

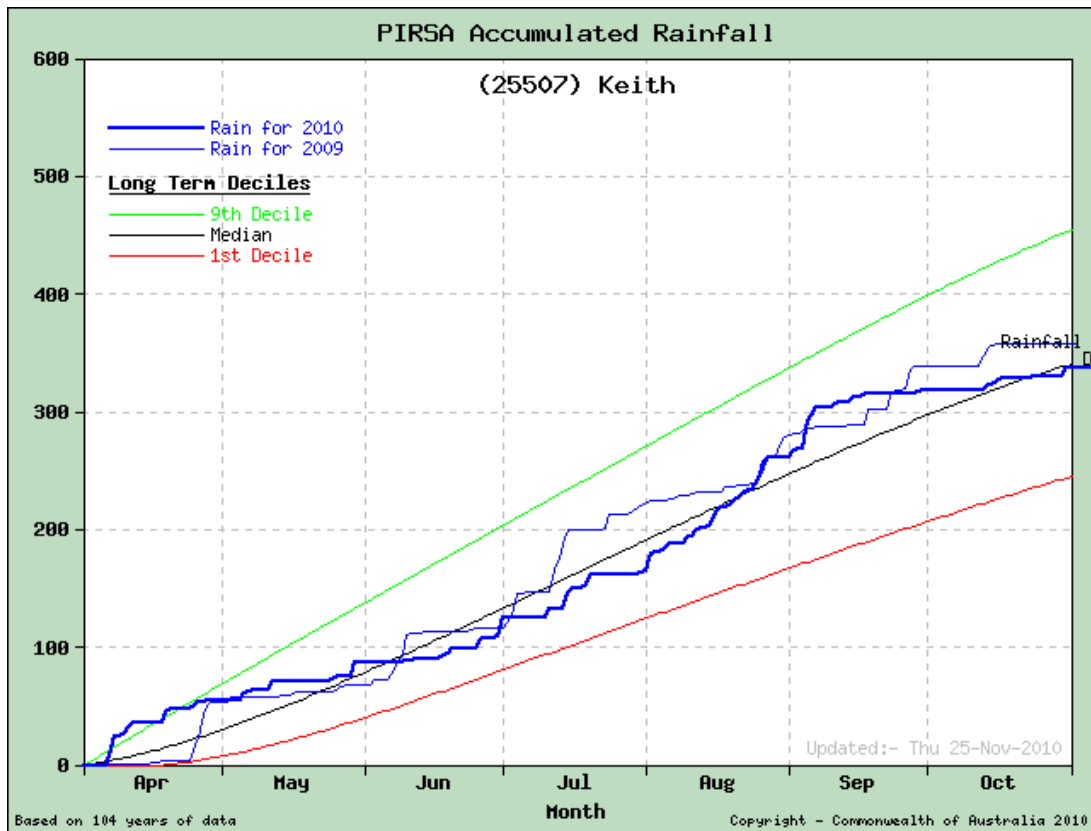
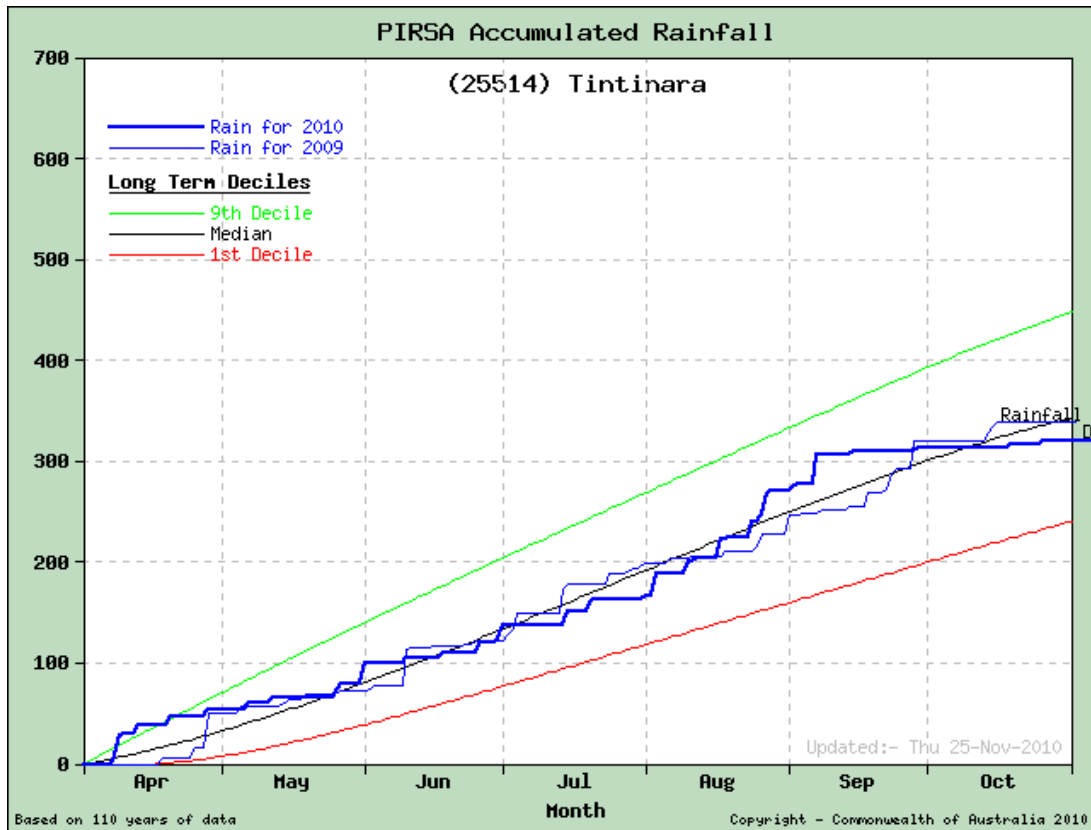
It is possible that producers will look to reduce the bulk of residues in paddocks to avoid problems with residues at seeding time. Mice problems are usually associated with high carryover of crop and pasture residues so farmers might also look to use tillage and burning to reduce mice numbers. Should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

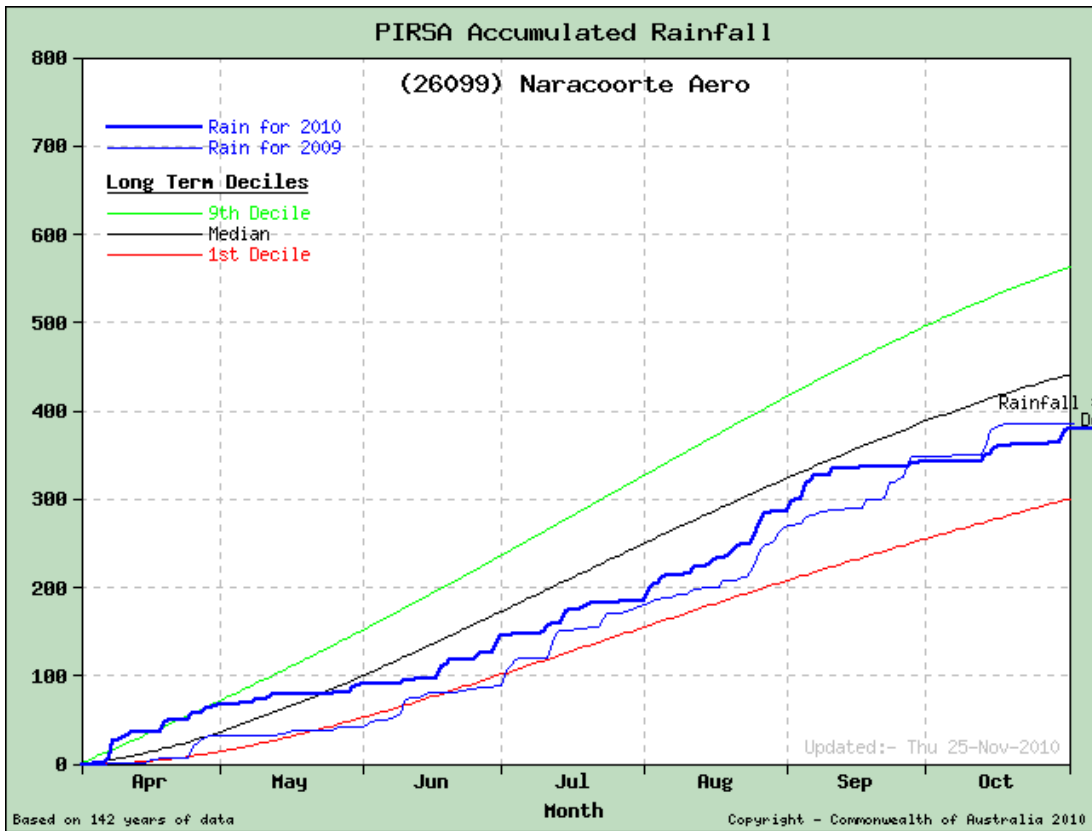
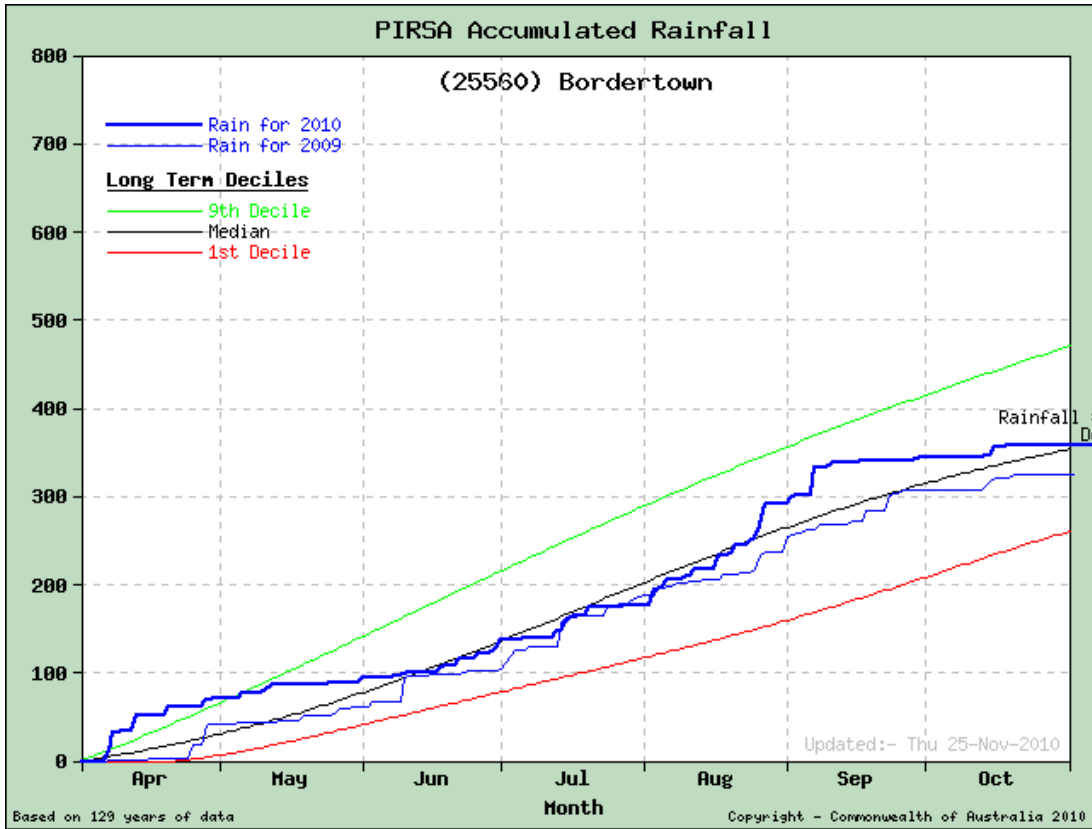
Producers' management of livestock grazing remains a critical factor in maintaining adequate levels of surface cover over summer and into autumn. The improved market for sheep is encouraging many producers to carry more stock so stock feed requirements have to be balanced against the need to retain adequate surface cover. In the South East region, producers reduced the area of cropping and increased stock numbers during the past year so grazing management might have more effect on erosion risk than recent seasons.

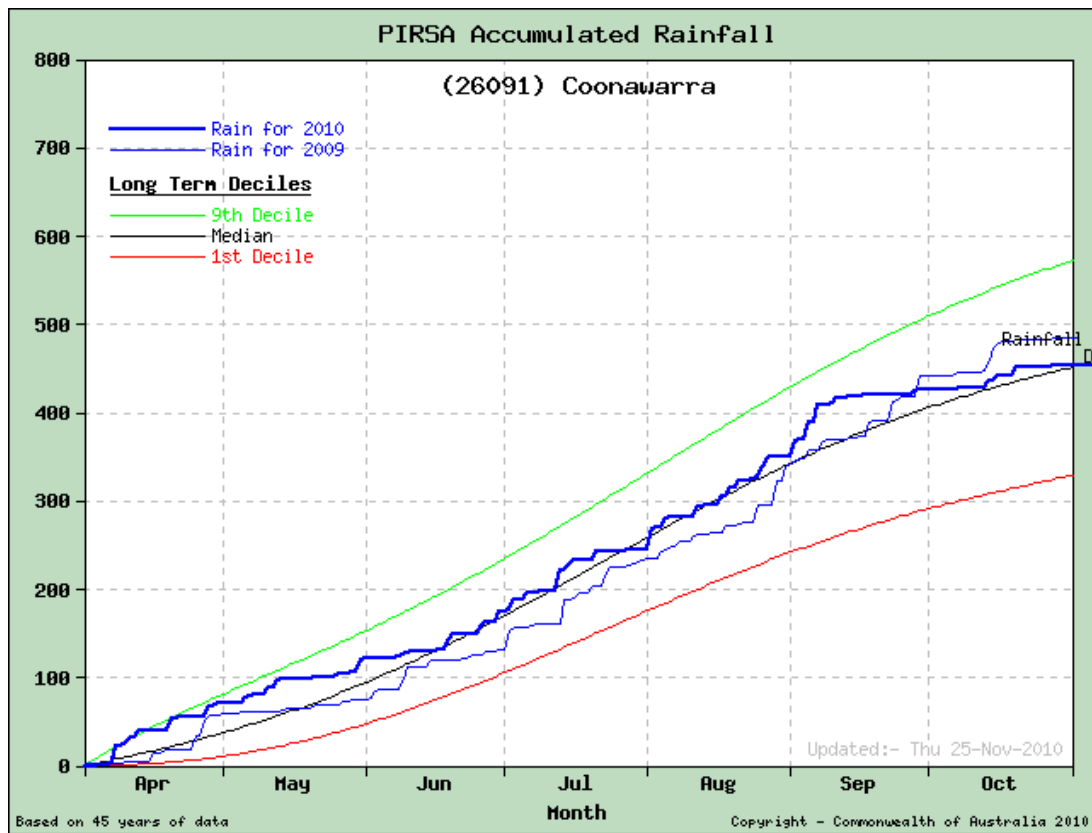
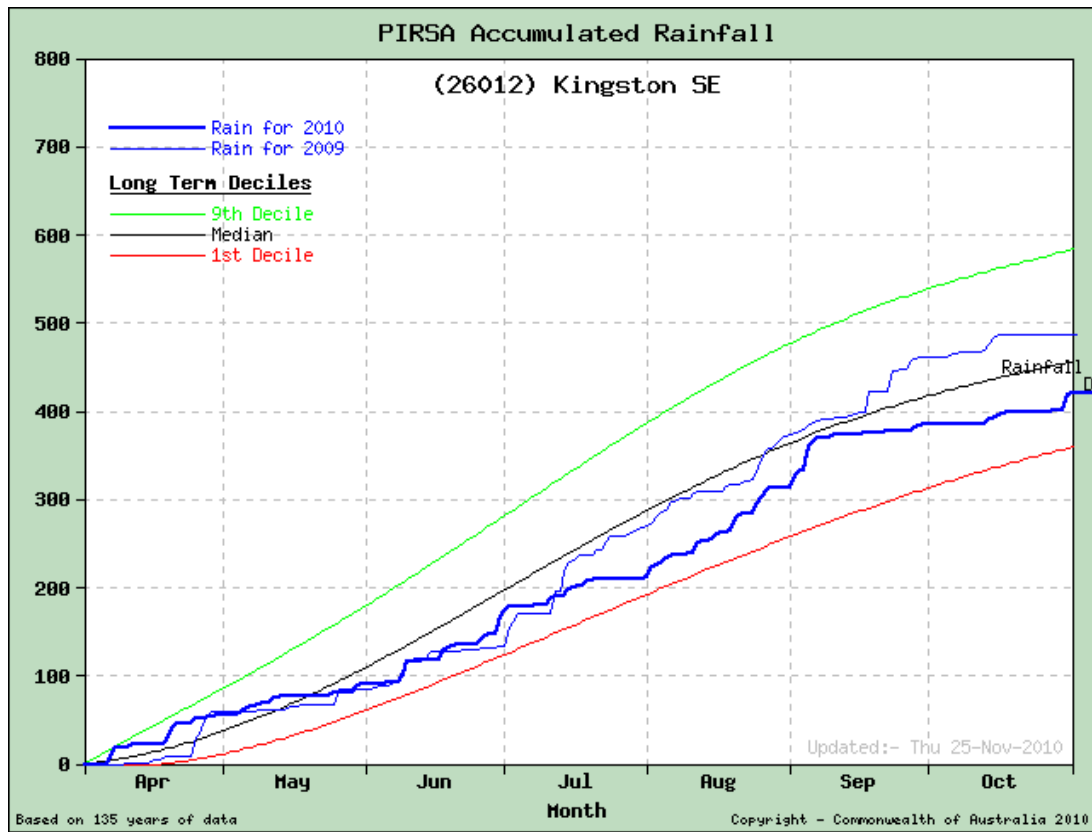
Cultivating land as close as practical to or at seeding time, will leave cover on the soil surface for a longer period of time. Summer rains can stimulate plant growth leading to better cover of the soil, however soil moisture retention and weed control is achieved by killing off this growth. Using herbicides 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.

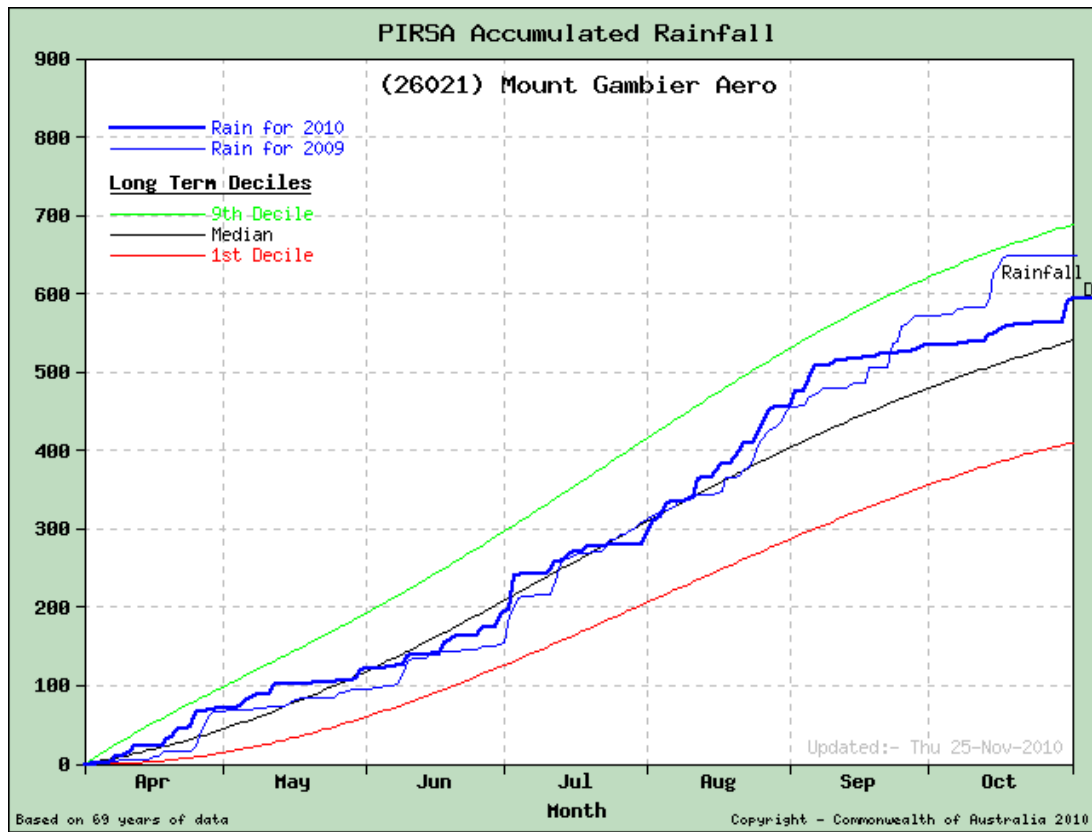
Appendix 1

Cumulative rainfall data for selected sites across the South East Region
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Appendix 2

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

