MALLEE CATCHMENT *facts*

Climate variability and land management practices

Above: Canola crop in the Mallee. Photo: Mallee CMA.

A study was undertaken during 2011 to help explain the extent to which climate variability influences short-term land management in the Victorian Mallee. This project did not examine the impact of long-term changes due to predicted climate change, but focused on natural climate variability.

The project compiled historic and current data on climate and land management practices. The outputs of this project provides analysis and discussion on trends in land management practices compared with trends in rainfall and temperature.

Method

Land management practices in the Mallee

Current land management practices were analysed using data from the Mallee Soil Erosion and Land Management Survey and available literature.

The analysis showed that although there are fewer farms in the Mallee, the farms are larger and farmers are growing more cereal, with increased cropping intensity. Up until 2011, farmers grew predominantly cereals and relatively fewer alternative crops; however this changed in 2011 when the region experienced above average rainfall.

Climate variability in the Mallee

Climate variability was analysed for the Mallee region, looking at rainfall and temperature between 1961-2011. The Rainfall Anomaly Index (RAI) allows the standardisation of the annual or seasonal rainfall against the long term average for a site. Figure 1 (over page) illustrates a series of fluctuating cycles of relatively wet and dry periods, with dry periods tending to last between one and three years up until 2000. Between 2001 and 2009 rainfall was between 10% to 55% below average. This was a sustained dry period in comparison to the historic time frame of 1961-1990. Wet years bookend this decade, where rainfall was more than 20% above average in 2000 and 75% above average in 2010.

At a glance

- Climate variability (in particular dry seasons) has played a role in influencing decisions made by farmers to increase cropping intensity, reduce tillage intensity and on some farms, adopt no-till;
- Attributing changes in land management practices to climate variability is difficult because farmers do not change uniformly and they change for a variety of reasons.

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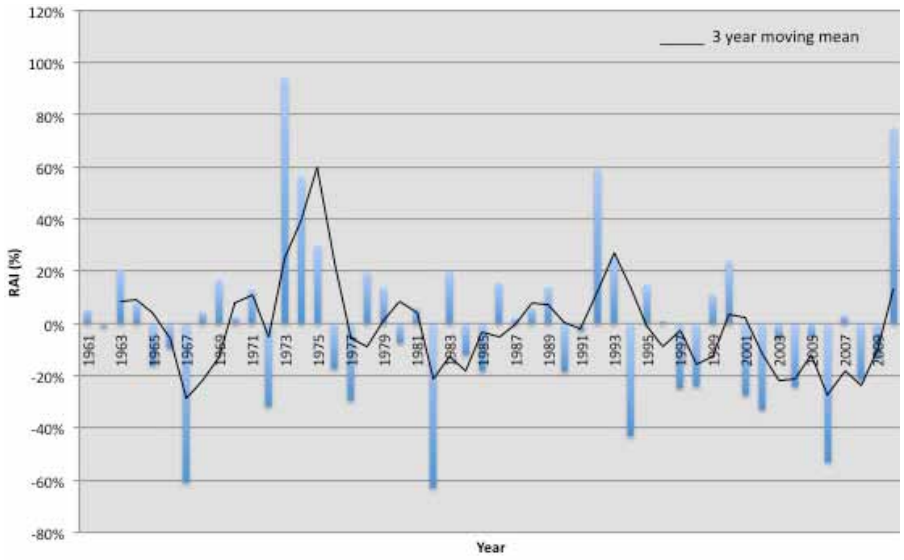

Figure 1. Mallee rainfall anomaly index 1961-2010

Influence of climate variability on land management decisions

This study has identified climate events or characteristics that could have influenced land management at a regional and sub-regional scale. Trends in conventional fallow for the summer and spring survey periods have been analysed, in relation to rainfall variability during the growing season. The occurrence of conventional or mechanically initiated fallows stayed in the range of 20% to 40% of paddocks surveyed from 1984 and peaked in 2001. A sustained decline in conventional fallow has occurred since then, which coincides with the prolonged dry period experienced up until the end of 2009.

Figure 2 shows the trends in land use of cropping land across three Mallee regions (between 1985 and 2010) in relation to growing season rainfall variability. The increase in cropping intensity between 2002-10 coincided with prolonged dry conditions, increasing from 50% to 74% of paddocks under crop in 2010.

Farmers responsed to this dry period by:

- reducing tillage intensity;
- rapidly adopting no-till;
- increasing cropping intensity; and
- cutting crops for hay.

During late 2010 and early 2011, above average rainfall was experienced in the region. This has seen a change in some practices including more stubble burning due to high stubble loads, delays in cultivation of paddocks due to access difficulties and an increase in alternative crops (mainly canola).

Conclusions

Climate variability (in particular dry seasons) has played some role in influencing decisions made by farmers to increase cropping intensity, reduce tillage intensity and on some farms, adopt no-till practices. The extent of the role of climate compared to other influencing factors is difficult to identify. During the extended drought farmers reduced tillage intensity for a combination of reasons. They wanted to protect their soil and at the same time they needed to improve their level of agronomic control (e.g. through sowing timeliness and more strategic nutrition inputs) to optimise production from limited soil moisture. A no-till system enabled them to better achieve this, especially on the lighter sandy soils in the central and northern Mallee.

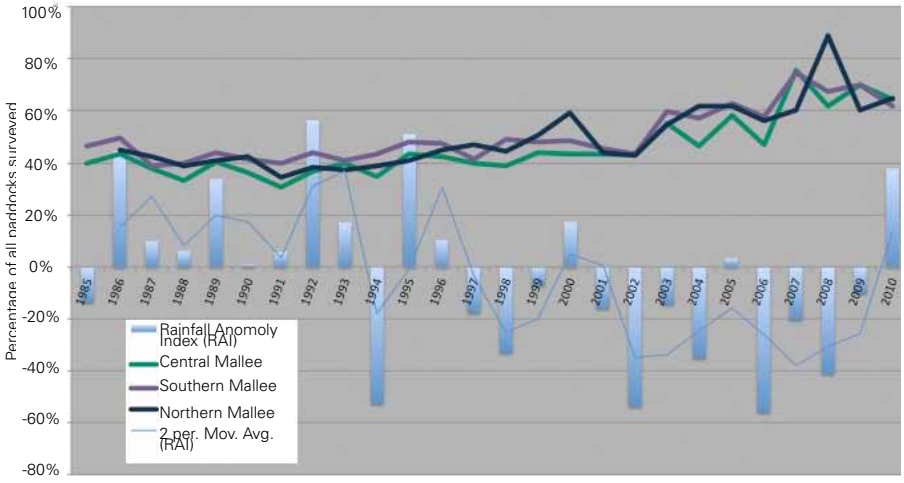

Figure 2. Trends in cropping intensity: cereal crops by region (1985 – 2010)

Acknowledgements

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Further information

The information for this fact sheet has been taken from "*Climate variability and land management practices*". A copy of this report is available from the Mallee CMA.

Project Partners

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