



CARING  
FOR  
OUR  
COUNTRY



Land management practice trends  
in Western Australia's dairy industry



## Introduction

Dairy farming is an important industry in Western Australia, contributing more than \$148 million to the gross value of agricultural production in the state and 0.4 per cent to the gross value of Australia's agricultural production in 2009–10 (ABS 2011). The major locations of dairy businesses are in the Northern Agricultural, South Coast and South West regions (Figure 1).

Improving soil condition is important to agricultural productivity and the quality of ecosystem services provided to the community from rural lands. Wind and water erosion, soil carbon rundown and soil acidification reduce the land's ability to provide productive soils, protect biodiversity, maintain clean air and water and withstand the effects of climate change, while producing food and fibre.

Caring for our Country—the Australian Government's \$2 billion flagship natural resource management initiative—is funding projects in the sustainable farm practices national priority area under the improving management practices and landscape scale conservation targets. These projects provide information

to farmers in the broadacre cropping, dairy, horticulture and beef cattle/sheep industries about land management practices that will help improve soil condition and contribute to maintaining a healthy environment.

By 30 May 2012, \$448 million had been approved for projects to improve soil and biodiversity management practices on farm. On farm practice change is being monitored using the biennial Australian Bureau of Statistics (ABS) Agricultural Resource Management Survey (ARMS), which surveys 33 000 of Australia's 135 000 agricultural businesses (farmers). Results are reported at the national, state and natural resource management region levels (ABS 2009). The numbers reported are estimated from a sample of almost one-quarter of all agricultural businesses, so the results are subject to sampling error. This is most pronounced for questions with lower response rates, more likely in smaller industries such as the dairy industry. Data were not publishable for some practices in regions where the numbers of dairy businesses were small.

## Dairy industry profile

According to ABS estimates, in 2009–10 Western Australia had 424 dairy businesses, which reported 144 335 hectares of grazing land. The average age of managers of dairy businesses was 55 years.

In 2007–08 they had been managing their holding for an average of 22 years and had farmed in their local region for 26 years. An estimated 9 per cent of dairy businesses (40) had a Landcare group member. Figures were not available for 2009–10.

Figure 1

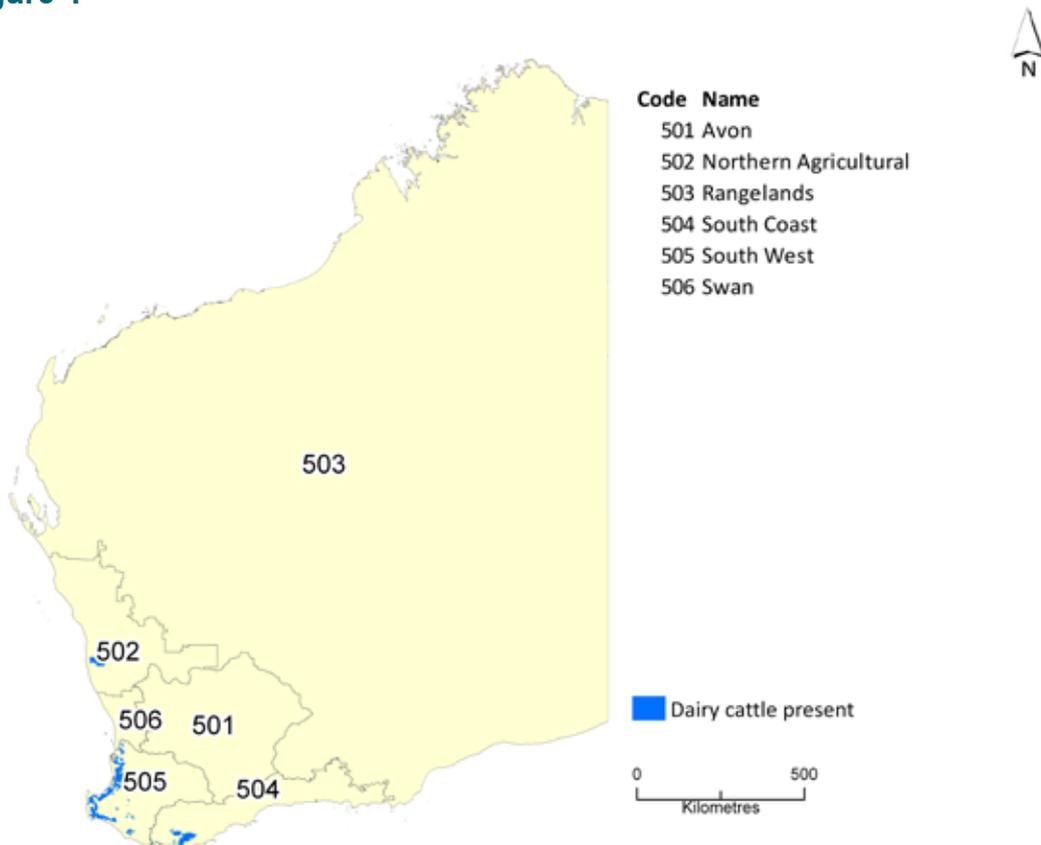


Figure 1. Indicative distribution of dairy businesses in Western Australia.  
Source: 2005–06 Agricultural Census, Australian Bureau of Statistics (mesh blocks containing dairy farms).

## Land management practices

Caring for our Country provided project funding to encourage dairy farmers to better manage ground cover (by monitoring the proportion of soil covered by plants and setting and managing to ground cover targets) and to test and lime soils regularly where needed. This funding has complemented the activities of state agencies and some industry and

community groups. Data from the ABS 2007–08 and 2009–10 ARMS and agricultural censuses for 1995–96, 2000–01 and 2010–11, (which surveyed all agricultural businesses) help track trends in adoption of these practices.

### Managing soil acidity

About 67 per cent of Western Australia’s more intensively managed grazing land is thought to have a high risk of soil acidification, and 14 per cent a moderate risk (Figure 2, Table 1). This includes some of the land used for dairying. Very acid soils are unlikely to support good ground cover, increasing the risk of soil

loss through wind and/or water erosion and reducing input to soil carbon. Areas at high risk are where soil pH is low, the soil has a low capacity to buffer against pH decreases and the dominant (current and/or past) agricultural practices are highly acidifying.

**Figure 2**

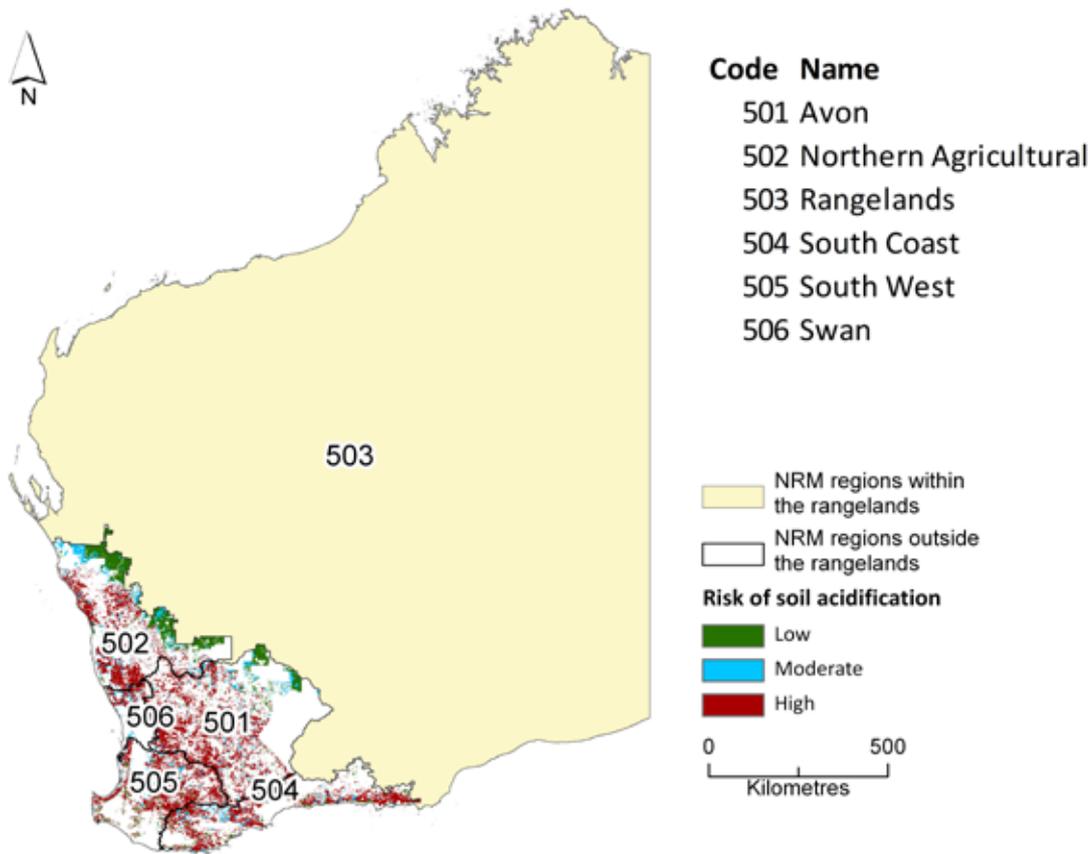


Figure 2. Soil acidification risks for most intensively managed grazing land in Western Australian natural resource management (NRM) regions outside the Rangelands. This map was produced by intersecting grazing land (on native or modified pastures including irrigated) from the Land use of Australia 2005–06 (ABARE-BRS 2010) with the soil acidification risk map produced by Wilson et al. 2009 and masking of natural resource management regions outside the Rangelands.

**Table 1**

	Low risk (%)	Moderate risk (%)	High risk (%)
Avon	13	13	73
Northern Agricultural	36	17	47
South Coast	11	12	77
South West	10	8	82
Swan	2	28	70
<b>Total</b>	<b>19</b>	<b>14</b>	<b>67</b>

Table 1. Estimated percentage of most intensively managed grazing areas in Western Australian natural resource management regions outside the Rangelands at risk of soil acidification. Source: See figure 2.

For dairy pastures in areas with soils prone to acidification, regular testing of soil pH and applications of lime and/or dolomite can be used to manage acidification. Testing soil nutrient levels to better match fertiliser applications to pasture requirements can also help slow soil acidification.

The estimated number of dairy businesses across Western Australia undertaking pH testing decreased (from 37 per cent to 34 per cent) between 2007–08 and 2009–10, as did the number of dairy businesses undertaking nutrient testing (from 37 per cent to 34 per cent; Figure 3). Estimated decreases in soil pH testing and soil nutrient testing occurred in the South West region, (from 50 per cent to 32 per cent for testing soil pH and from 49 per cent to 32 per cent for soil nutrient testing; Figure 3). Data for other regions were not publishable.

## Maintaining ground cover

Monitoring ground cover levels in paddocks and using ground cover targets (the desired percentage of soil covered by living or dead vegetation) helps protect the soil from loss through wind and water erosion, while helping to build soil carbon. Maintaining good ground cover levels also helps to improve drought resilience by ensuring pastures can respond quickly to rain.

An estimated 71 per cent of dairy businesses monitored ground cover levels in paddocks in 2007–08; no data were publishable for 2009–10. The estimated percentage of dairy businesses setting ground cover targets increased from 18 per cent to 42 per cent

A little over one-third (38 per cent) of dairy businesses were estimated to be applying lime or dolomite to manage soil acidity in Western Australia in 2007–08 and 2009–10 (Figure 4). The number of businesses applying lime or dolomite in any of the natural resource management regions did not increase. Small decreases are estimated to have occurred in the South Coast and South West regions (from 37 per cent to 34 per cent and from 46 per cent to 44 per cent respectively; Figure 4). Longer-term data for dairy businesses in Western Australia show that an estimated 32 per cent applied lime and/or dolomite in 1995–96. This increased to 40 per cent in 2000–01 and decreased to 32 per cent in 2009–10 (Figure 5). No data were publishable for businesses applying dolomite for 2009–10. Table 2 shows the rates of lime application for Western Australian dairy businesses in 2007–08.

between 2007–08 and 2009–10, decreasing to 37 per cent in 2010–11 (Figure 6). The percentage of dairy businesses monitoring ground cover in paddocks increased in the South West region between 2007–08 and 2009–10 (from 73 per cent to 91 per cent; Figure 6). No data were publishable for 2010–11. The percentage of dairy businesses setting ground cover targets in the South West region followed a similar trend to the statewide figures, increasing between 2007–08 and 2009–10 (from 25 per cent to 42 per cent) before decreasing to 35 per cent in 2010–11 (Figure 6). Data were not publishable for one or more of the years for four of the six natural resource management regions.

Figure 3

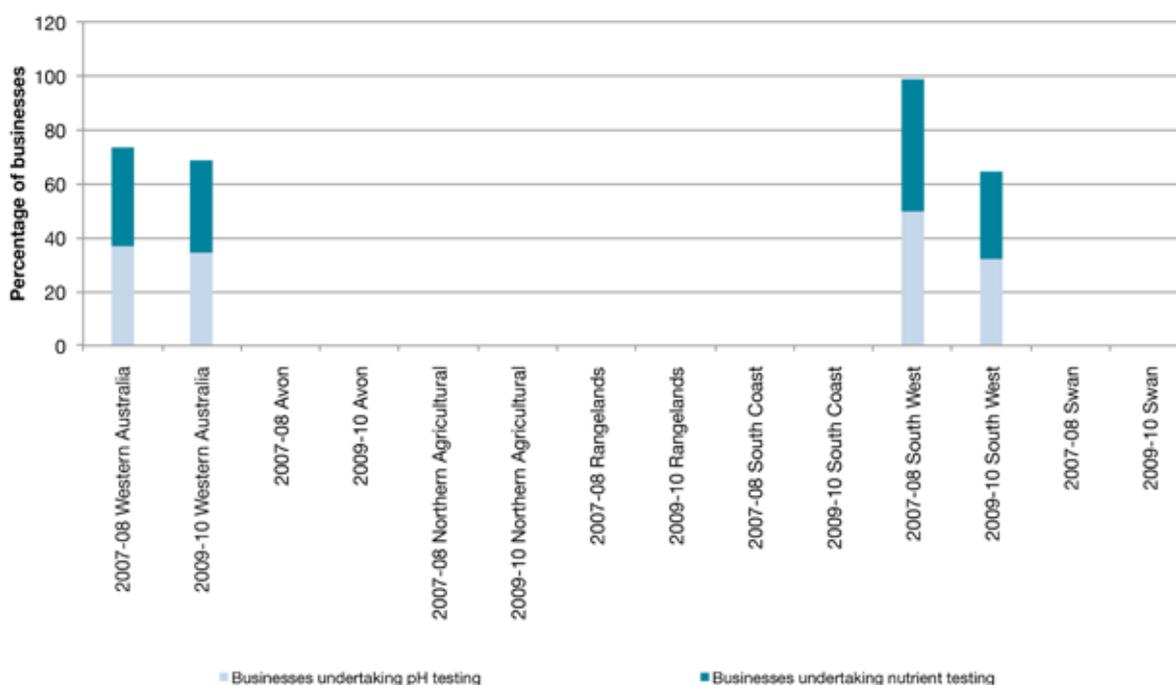


Figure 3. Percentage of dairy businesses in Western Australia undertaking pH and soil nutrient testing in 2007–08 and 2009–10  
 Note: Results for the number of businesses undertaking pH and soil nutrient testing in the Avon (2007–08 and 2009–10), Northern Agricultural (2009–10), South Coast (2007–08 and 2009–10) and Swan (2007–08) regions were not publishable.

**Figure 4**

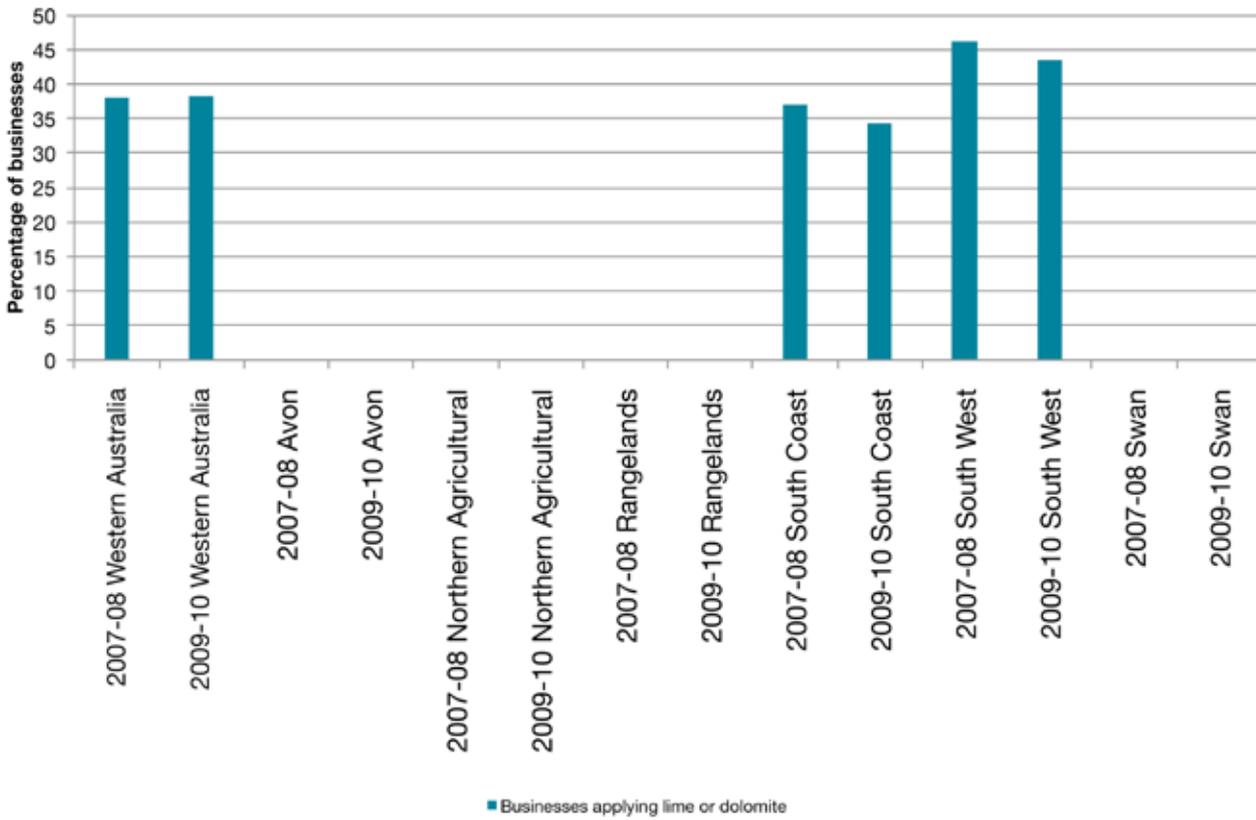


Figure 4. Percentage of dairy businesses in Western Australia applying lime and/or dolomite to their holdings in 2007–08 and 2009–10  
 Note: Results for the Avon (2007–08 and 2009–10), Northern Agricultural (2009–10) and Swan (2007–08 and 2009–10) regions were not publishable.

**Figure 5**

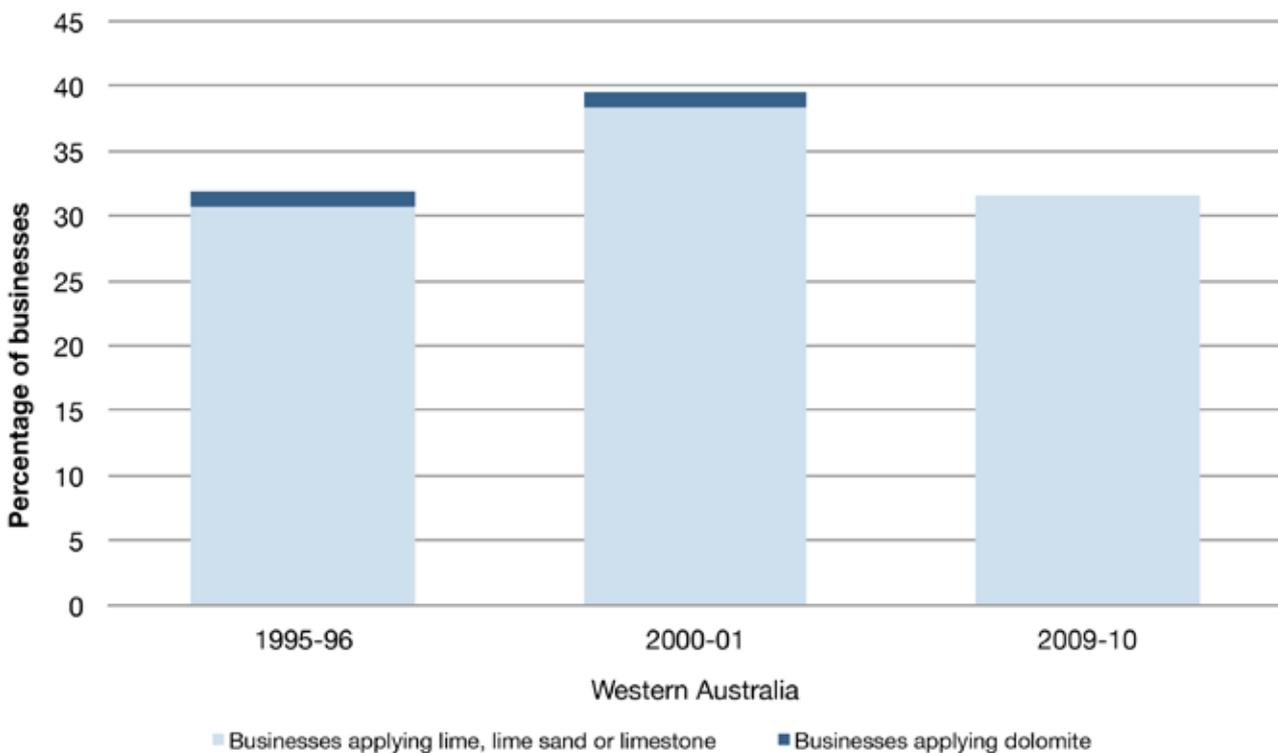


Figure 5. Percentage of dairy businesses in Western Australia applying lime and/or dolomite to their holdings in 1995–96, 2000–01 and 2009–10.  
 Note: Data for businesses applying dolomite were not publishable for 2009–10; however, a combined percentage for businesses applying lime and/or dolomite for 2009–10 is presented in Figure 4.

**Table 2**

	Tonnes (t) of lime and/or dolomite applied	Lime and/or dolomite application rate (t/ha)
Western Australia	28 041	0.62
Avon	np	na
Northern Agricultural	0	0
Rangelands	0	0
South Coast	4 150	0.85
South West	23 891	0.59
Swan	np	na

na Not applicable. np Not publishable.

Table 2. Rates of lime application for Western Australian dairy businesses in 2007–08.

**Figure 6**

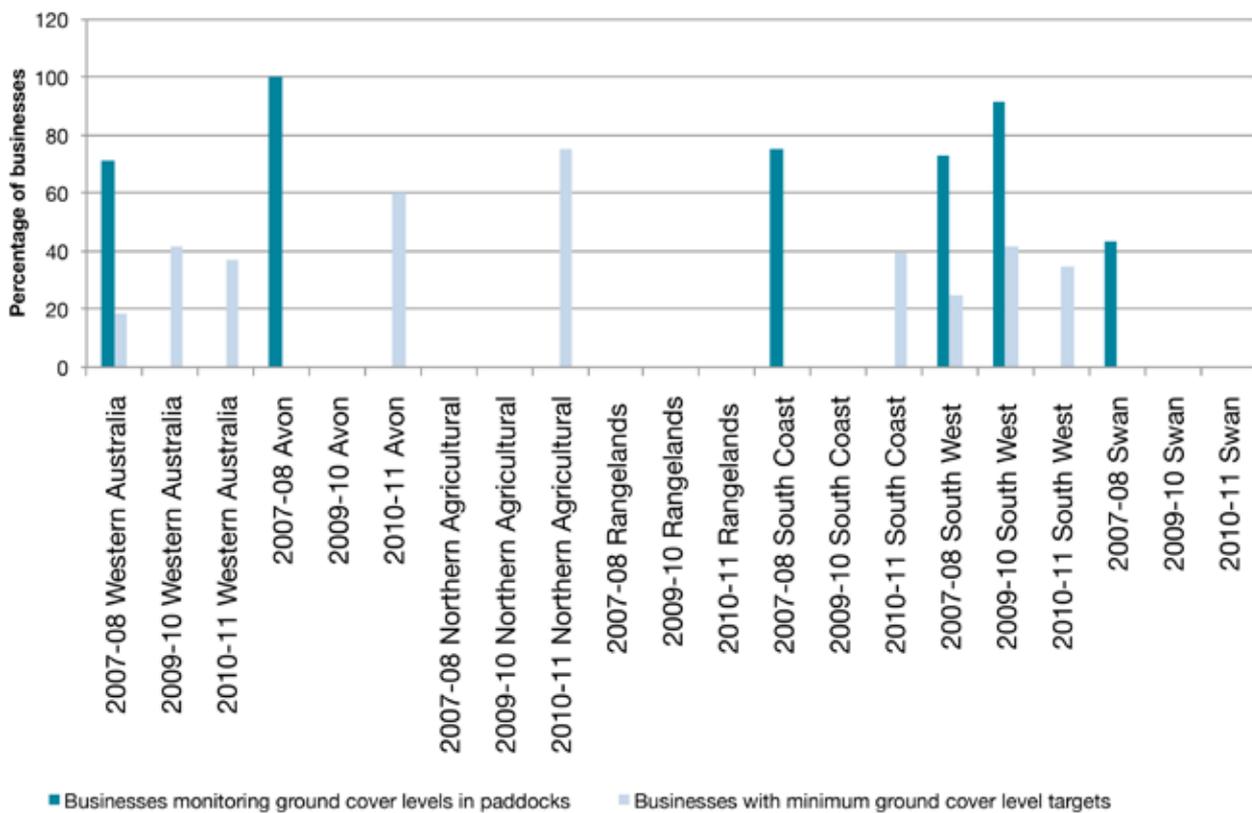


Figure 6. Percentage of dairy businesses in Western Australia monitoring ground cover in 2007–08 and 2009–10 (no data for ground cover monitoring were collected in 2010–11) and with targets for minimum ground cover levels in 2007–08, 2009–10 and 2010–11. Results for dairy businesses monitoring ground cover were not publishable for Western Australia (2009–10) and the Avon (2009–10), Northern Agricultural (2007–08 and 2009–10), South Coast (2009–10) and Swan (2009–10) regions. Results for dairy businesses with targets for minimum ground cover level were not publishable for the Avon (2007–08), Northern Agricultural (2007–08 and 2009–10), South Coast (2007–08 and 2009–10) and Swan (2007–08, 2009–10 and 2010–11) regions.

# Conclusions

The limited data available suggest Western Australian dairy businesses are aware of the need to monitor ground cover levels, but need further encouragement to set and manage to ground cover targets. Ground cover levels of at least 50 per cent to 70 per cent (depending on location) are needed to protect the soil surface from wind and water erosion. Dairy businesses need more encouragement to set and manage groundcover targets appropriate to their locations.

Given the extensive and insidious nature of soil acidification, with more than 80 per cent of all intensively managed grazing land in Western Australia at moderate to high risk of acidification, it may be necessary to increase regular testing and, where needed, liming of dairy pastures.

# References

ABARE-BRS 2010, *Land use of Australia 2005–06*, version 4, Australian Bureau of Agricultural and Resource Economics–Bureau of Rural Sciences, Canberra.

ABS 2009, *Land management and farming in Australia, 2007–08*, cat. no. 4627.0, Australian Bureau of Statistics, Canberra, available at [abs.gov.au/AUSSTATS/abs@.nsf/allprimarymainfeatures/C3FC0BDD85E571DBCA2578B50011D983?opendocument](http://abs.gov.au/AUSSTATS/abs@.nsf/allprimarymainfeatures/C3FC0BDD85E571DBCA2578B50011D983?opendocument).

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