



CARING  
FOR  
OUR  
COUNTRY



Land management practice trends  
in Queensland's grazing  
(beef cattle/sheep) industries



## Introduction

Grazing (beef cattle/sheep) is an important industry in Queensland; meat and wool production by this industry contributed more than 43 per cent to the gross value of agricultural production of the state and 10 per cent to the gross value of Australia's agricultural production in 2009–10 (ABS 2011). The area of grazing land operated by beef cattle/sheep businesses was estimated to be almost 145 million hectares, more than 83 per cent of the total area of Queensland (ABARE–BRS 2010, 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 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).

## Beef cattle/sheep industry profile

According to ABS estimates, in 2009–10 Queensland had more than 18 075 beef cattle/sheep businesses, a decrease of about 4 per cent since 2007–08. During this time the estimated area of grazing land reported decreased by 9 per cent. In 2009–10 the average age of managers of grazing businesses in Queensland was 55 years; on average they had managed their holdings for 22 years and farmed in their local region for 29 years. An estimated 19 per cent of grazing businesses (3487) had a Landcare group member.

A large portion of the area grazed in Queensland (28 per cent or 32.8 million hectares) and most of the beef cattle/sheep businesses (89 per cent or 16 035) were located in natural resource management regions outside the rangelands boundary (ABS 2011b). Businesses outside the rangelands were generally more intensively managed properties and were more likely to be fertilising pastures.

**Figure 1**

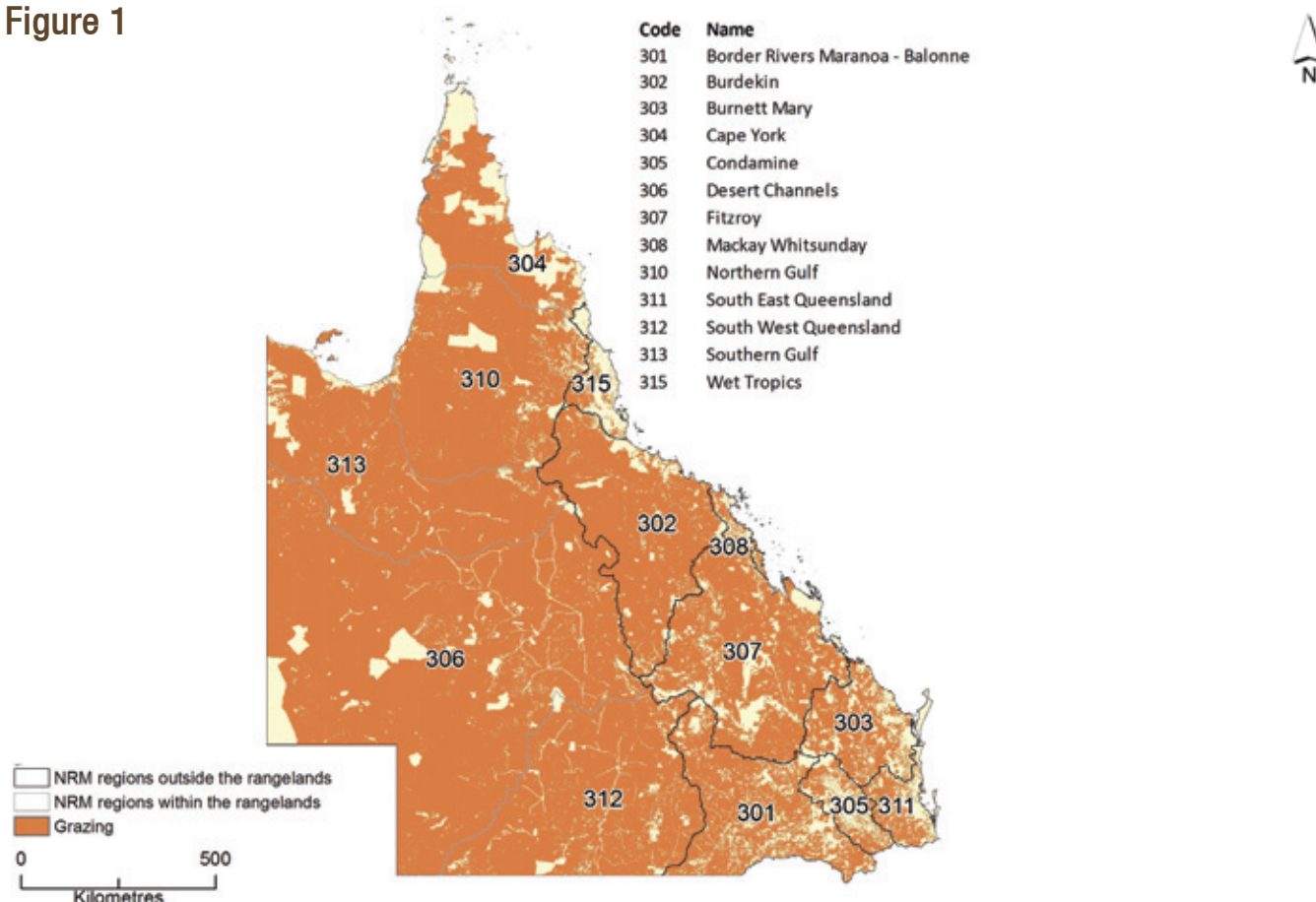


Figure 1. Grazing land in Queensland natural resource management regions (NRM) showing regions within and outside the rangelands, 2005–06. Source: ABARE–BRS 2010.

## Land management practices

Caring for our Country provided project funding to encourage farmers to better manage ground cover (by monitoring the proportion of the soil covered by plants and establishing minimum targets below which ground cover should not fall) and, on more intensively managed holdings, to test and where needed lime soils regularly. 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 (all agricultural businesses surveyed) help track trends in adoption of these practices. Data were not publishable for some practices in regions where the numbers of beef cattle/sheep businesses were small.

## Managing soil acidity

About half of Australia’s agricultural land is estimated to have a surface soil pH of less than or equal to 5.5, which is below optimum for extremely acid-sensitive agricultural crops and pastures and below the optimal level to prevent subsoil acidification (National Land and Water Resources Audit 2001). Where soil

acidity moves further down the soil profile, damage may be irreparable. 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.



About 12 per cent of Queensland's more intensively managed grazing land (i.e. outside the rangelands) is thought to have a high risk of soil acidification and 21 per cent a moderate risk (Figure 2, Table 1). Areas at high risk are where soil pH is currently low, the soil has a low capacity to buffer against pH decreases and the dominant (current and/ or past) agricultural practices are highly acidifying.

For more intensively managed holdings 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.

Between 2007–08 and 2009–10, the estimated percentage of businesses outside the rangelands testing soil pH decreased from 11 per cent to 7 per cent and the percentage testing soil nutrients also decreased from 11 per cent to 7 per cent (Figure 3). Estimated

increases in soil pH and soil nutrient testing occurred in the Wet Tropics region (from 21 to 22 per cent and 20 to 22 per cent respectively). The greatest decreases in soil pH testing (from 11 per cent to 8 per cent) and nutrient testing (from 10 per cent to 9 per cent) occurred in the Border Rivers Maranoa–Balonne region.

The estimated percentage of Queensland businesses outside the rangelands applying lime and/or dolomite to their holdings to manage soil acidity was around 4 per cent in 2007–08 and 2009–10 (Figure 4). There were slight increases in the number of businesses applying lime or dolomite in the Borders Rivers Maranoa–Balonne, Condamine, Fitzroy and Wet Tropics regions. The largest estimated decrease (from 5 per cent to 2 per cent) occurred in the Burnett Mary region (Figure 4). Table 2 shows the rates of lime application for Queensland's more intensively managed grazing lands for 2007–08.

Figure 2

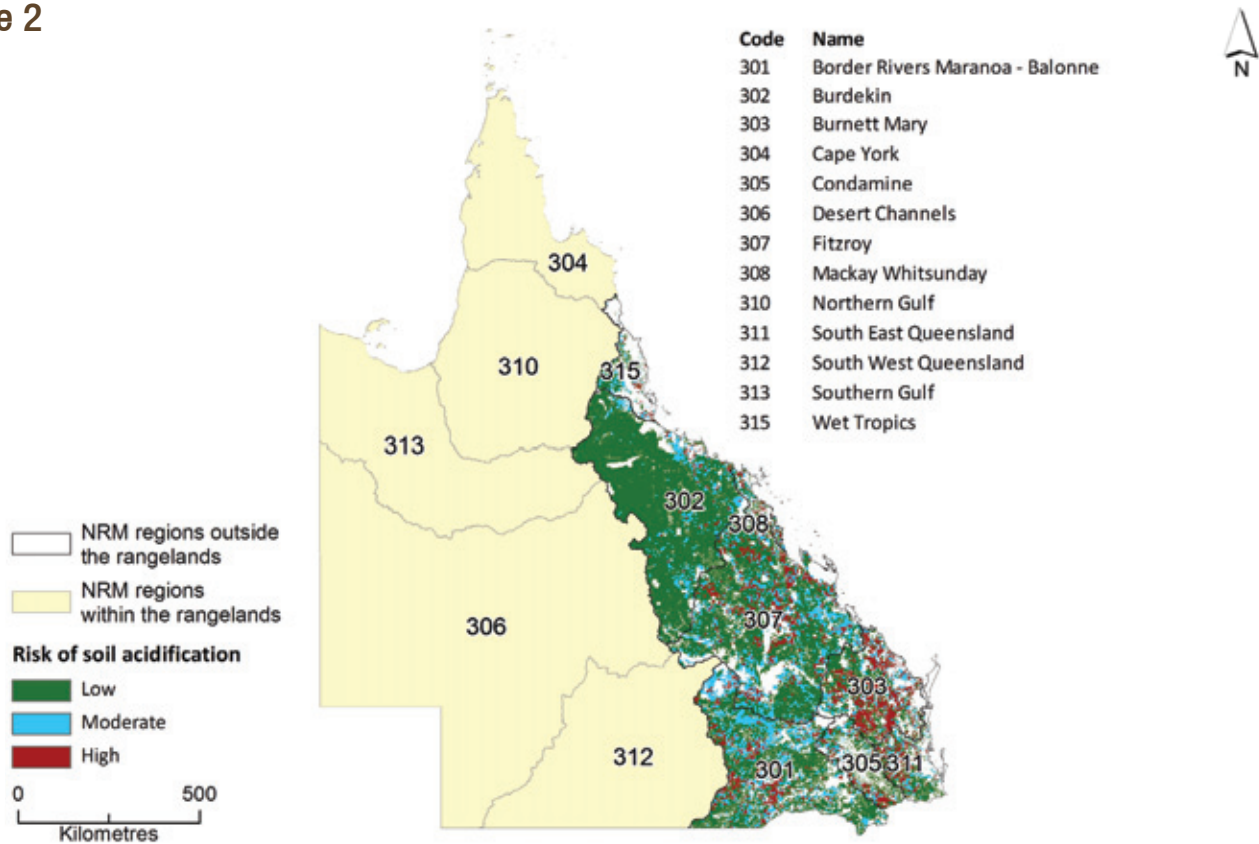


Figure 2. Soil acidification risks for more intensively managed grazing land in Queensland natural resource management regions outside the rangelands. vvtNote: This map was produced by intersecting grazing land (on native or modified pastures including irrigated) from Land use of Australia 2005–06 (ABARE–BRS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



**Table 1**

	Low risk (%)	Moderate risk (%)	High risk (%)
Border Rivers Maranoa–Balonne	57	31	12
Burdekin	90	9	1
Burnett Mary	41	20	39
Condamine	56	23	21
Fitzroy	62	26	12
Mackay Whitsunday	48	30	22
South East	56	21	23
Wet Tropics	56	35	9
Queensland	68	21	12

Table 1. Estimated percentage of grazing area in Queensland at risk of soil acidification. Source: These figures were produced by intersecting grazing land (on native or modified pastures including irrigated) from Land use of Australia 2005–06 (ABARE–BRS 2010) with the soil acidification risk map produced by Wilson et al. 2009 and masking to natural resource management regions outside the rangelands.

**Figure 3**

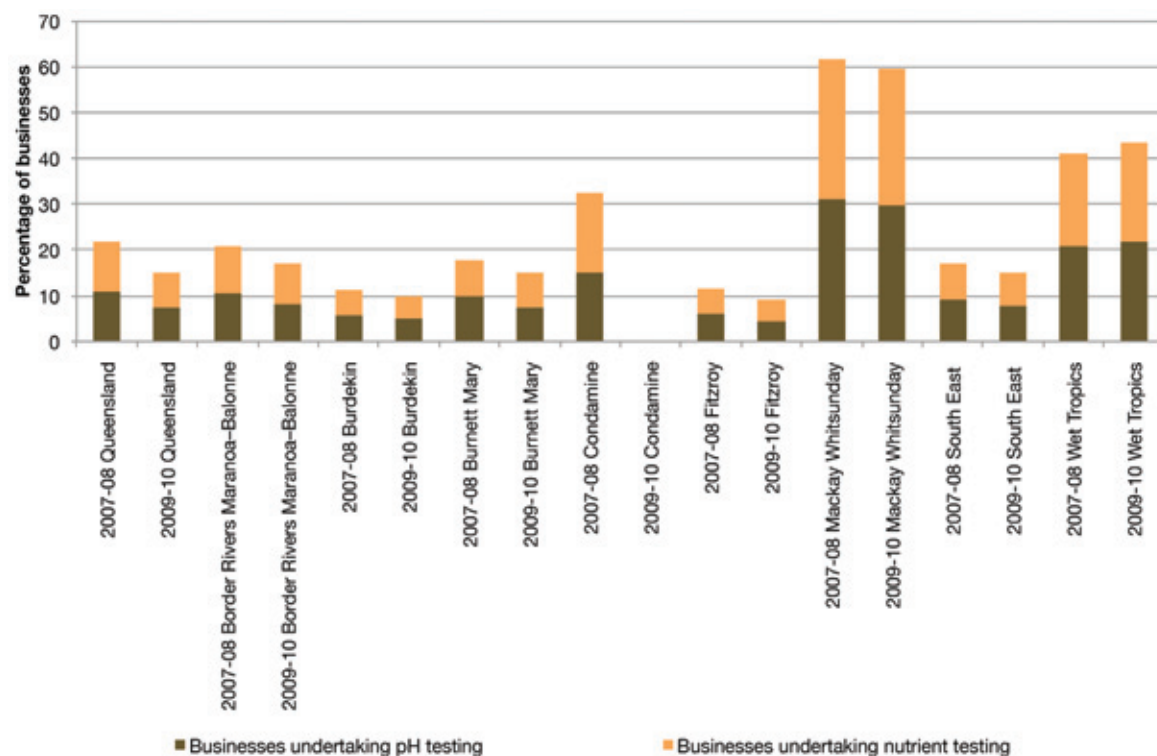


Figure 3. Percentage of Queensland beef cattle/sheep businesses outside the rangelands undertaking pH and soil nutrient testing, 2007–08 and 2009–10. Note: Results for the Kangaroo Island region (2009–10) were not publishable.



**Table 2**

	Tonnes (t) of lime applied	Lime application rate (t/ha)	Tonnes (t) of dolomite applied	Dolomite application rate (t/ha)
Queensland	34 178	1.79	8 155	1.51
Border Rivers Maranoa– Balonne	5 299	1.91	3 693	1.75
Burdekin	np	na	np	na
Burnett Mary	13 393	2.66	799	1.07
Condamine	np	na	np	na
Fitzroy	np	na	np	na
Mackay Whitsunday	np	na	np	na
South East	5 849	1.45	995	1.77
Wet Tropics	9 636	2.03	2 668	1.76

na Not applicable. np Not publishable.

Table 2. Rates of lime and dolomite application for Queensland's intensively managed grazing lands, 2007–08.

**Figure 4**

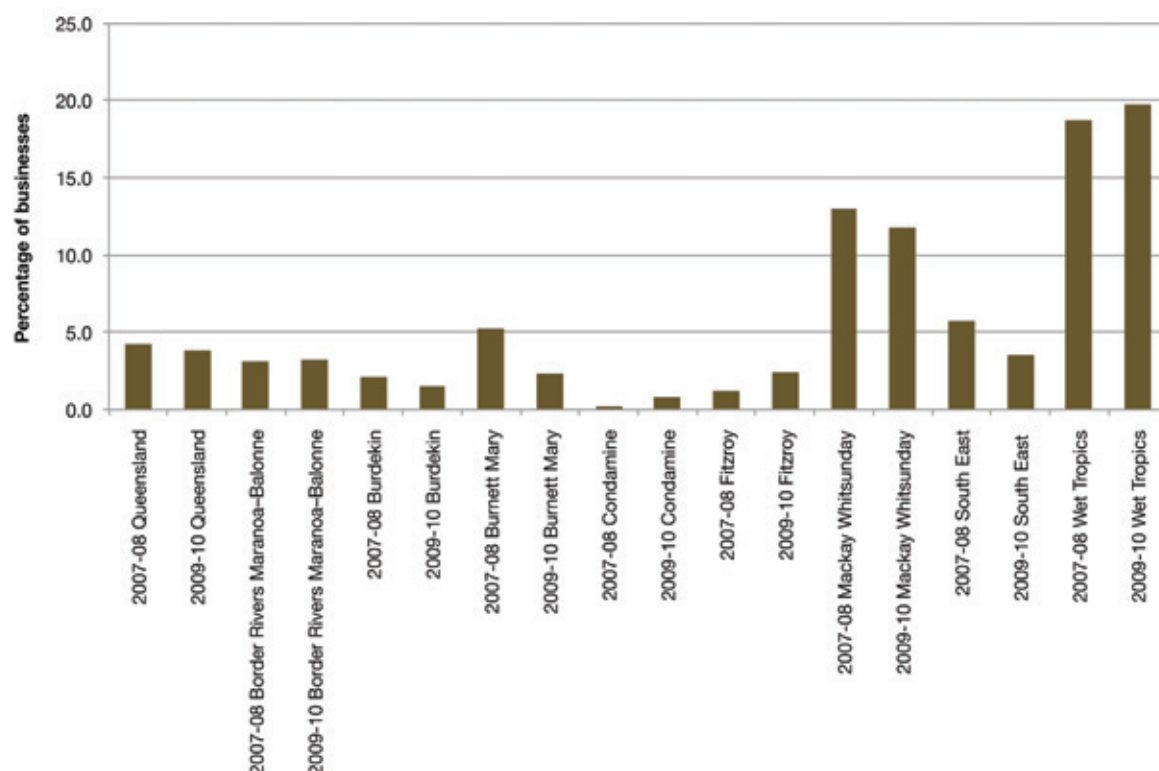


Figure 4. Percentage of beef cattle/sheep businesses outside the rangelands in Queensland applying lime and dolomite to their holdings, 2007–08 and 2009–10.



Figure 5

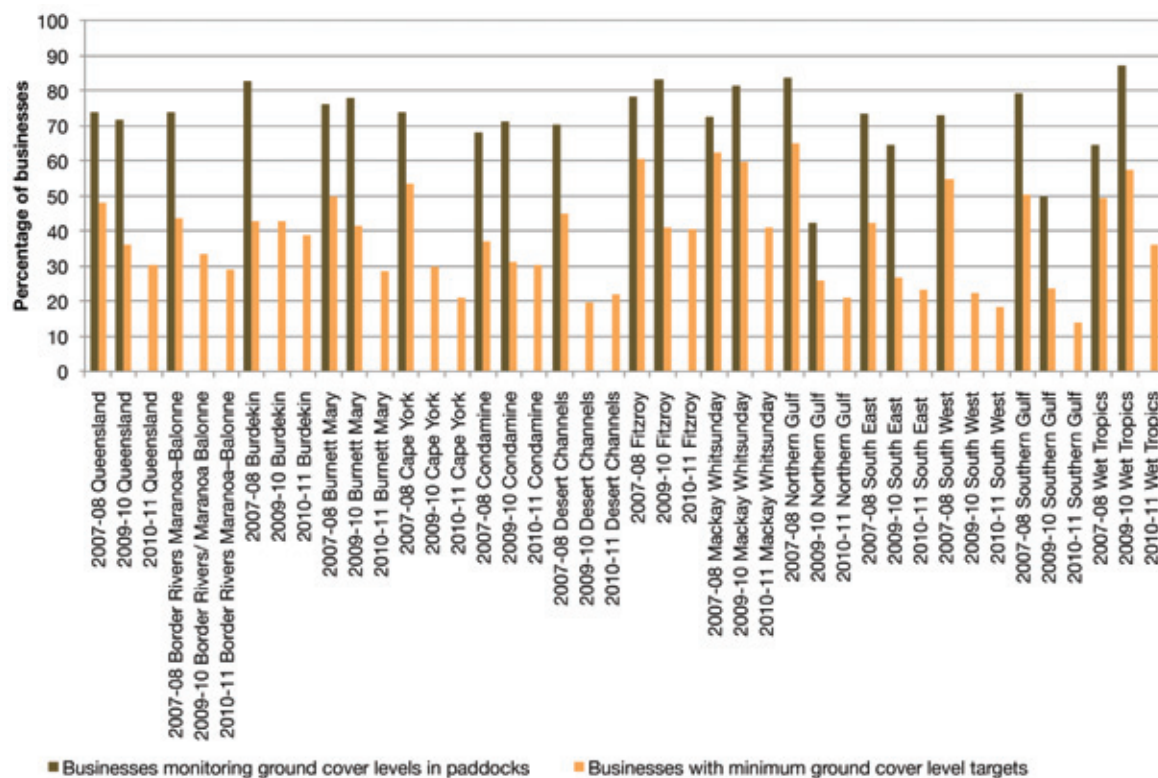


Figure 5. Percentage of beef cattle/sheep businesses in Queensland monitoring ground cover in paddocks, 2007–08 and 2009–10, with targets for minimum ground cover levels, 2007–08, 2009–10 and 2010–11. Note: No data for ground cover monitoring were collected in 2010–11. Results for the number of businesses monitoring ground cover levels in paddocks were not publishable for the Alinytjara Wilurara/South Australian Arid Lands (2009–10) and Kangaroo Island (2009–10) regions. Results for the number of businesses with targets for minimum ground cover levels were not publishable for the Alinytjara Wilurara/South Australian Arid Lands (2007–08) and Adelaide and Mount Lofty Ranges (2007–08) regions.

## 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 soil loss through wind and water erosion, while helping to build soil carbon. Maintaining good ground cover also improves drought resilience by ensuring pastures can respond quickly to rain.

## Conclusions

The data suggest that there has been a small decline in the percentage of beef cattle/sheep businesses monitoring ground cover. 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. The estimated larger reduction in the percentage of businesses reporting setting ground cover targets may have been due to changes in the survey 2009–10 question; respondents may have had difficulty providing the additional information requested. Further work is needed to

The estimated proportion of grazing (beef cattle/sheep) businesses both in and outside the rangelands monitoring ground cover levels decreased from 74 per cent in 2007–08 to 72 per cent in 2009–10. Increases occurred in five of the 13 regions, with the greatest increase (from 65 per cent to 87 per cent) in the Wet Tropics region (Figure 5). The estimated percentage of businesses setting ground cover targets decreased from 48 per cent to 30 per cent in the between 2007–08 and 2010–11. A decrease was reported for all regions during that time period (Figure 5).

encourage grazing businesses in most natural resource management regions to set and manage to ground cover targets appropriate to their location.

Given the extensive and insidious nature of soil acidification, with almost one-third of all land grazed outside the rangelands in Queensland at moderate to high risk of acidification, it may be necessary to increase regular soil testing and, where needed, liming of more intensively managed pastures in some regions, especially in the Burnett Mary, Mackay Whitsunday and South East regions.

# References

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