



2007-08

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# LAND MANAGEMENT AND FARMING IN AUSTRALIA

AUSTRALIA

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## INQUIRIES

For further information about these and related statistics, contact the National Information and Referral Service on 1300 135 070.

## ABOUT THIS PUBLICATION

This publication presents information on agricultural land management practices. Data were collected in the 2007–08 Agricultural Resource Management Survey (ARMS) conducted by the ABS.

The publication and related datacubes provide important information on a variety of management practices of Australian agricultural businesses, including cropping and pasture management, soil management, fertiliser use, surface water and effluent management, natural environment conservation protection and farm management.

The estimates in this publication provide benchmark data on resource management practices for the Australian Government's Caring for our Country program. This program is a Commonwealth government initiative that seeks to achieve an environment that is healthy, better protected, well managed and resilient, and provides essential ecosystem services in a changing climate.

Also presented in the datacubes attached to this publication are final data on adverse seasonal conditions experienced in 2007–08, and the farm management responses found effective in dealing with these adverse seasonal conditions. These data replace the preliminary data released in *Principal Agricultural Commodities, Australia, Preliminary, 2007–08* (cat. no. 7111.0).

Data are published at the Australian, State and regional (Natural Resource Management region) levels in this publication and related datacubes.

Complementary data collected from the 2007–08 ARMS can be found in *Water Use on Australian Farms, 2007–08* (cat. no. 4618.0) and *Agricultural Commodities, Australia, 2007–08* (cat. no. 7121.0).

Funding for the land management component of the 2007–08 ARMS was provided by the Australian Government via the Department of Agriculture, Fisheries and Forestry and the Department of the Environment, Water, Heritage and the Arts.

The ABS welcomes feedback on this publication in terms of its relevance, usefulness, quality and the range of data presented. Please direct feedback to the National Information and Referral Service on 1300 135 070 or to: The Director, Environment and Agriculture Business Statistics Centre, Australian Bureau of Statistics, GPO Box 66, Hobart TAS 7001. Alternatively, email <adrian.bugg@abs.gov.au> or phone (03) 6222 5850.

Brian Pink  
Australian Statistician

## SUMMARY OF FINDINGS

### LAND USE AND AGRICULTURAL ACTIVITY

In 2007–08, approximately 54% of Australia's total land area was managed by agricultural businesses. On a state basis, the lowest proportion of land managed by agricultural businesses was in Tasmania (23% of state area) while the highest was in Queensland (82% of state area).

Grazing land accounted for 87% of land managed by agricultural businesses. This included both grazing on improved pasture (16% of agricultural land use) and other grazing land (71% of agricultural land use). Other agricultural land use included 8% for cropping. Land on agricultural holdings that was not used for agriculture included 2% set aside for conservation. Grazing on improved pasture was lowest in the Northern Territory at 3% and highest in Tasmania at 49%. Areas used for grazing on land other than improved pasture ranged from 12% of agricultural land in Victoria to 93% of agricultural land in the Northern Territory. The percentage of agricultural land used for crops ranged from less than 1% in the Northern Territory to 38% in Victoria.

In 2007–08, the majority of agricultural businesses were engaged in grazing activities (69%). This was evident across all states, except South Australia and Western Australia.

Half of all agricultural businesses in Australia were engaged in cropping activities. Cropping was more common in Western Australia and Tasmania, with 68% and 65% respectively.

While relatively few agricultural businesses were engaged in horticulture on a national basis (17% of all agricultural businesses), almost half of the agricultural businesses in the Northern Territory reported that they had undertaken horticultural activities, mainly fruit and nut production.

### LAND MANAGEMENT PRACTICES

The most common land management practices undertaken by agricultural businesses in 2007–08 were surface water management (74% of agricultural businesses), application of fertiliser (62%) and monitoring ground cover in paddocks (54%). Overall, 63% of all agricultural businesses reported making one or more land management changes over the last five years to address land and soil related problems on their holding. This was reflected in all states and territories except the Northern Territory where fewer agricultural businesses (46%) reported changes to land management practices.

### PROTECTING THE NATURAL ENVIRONMENT FOR CONSERVATION PURPOSES

In 2007–08, 66% of all agricultural businesses reported having native vegetation on their holding and just over half of these protected their native vegetation for conservation purposes. Similarly, more than half of all agricultural businesses reported rivers or creeks on their holding with 49% of these protecting their river or creek banks for conservation purposes. Wetlands were reported by 10% of all agricultural businesses with just under half of these businesses reporting that they had protected these wetlands for conservation purposes.

### TILLAGE & FALLOW LAND

In 2007–08, 75 thousand agricultural businesses prepared land for crops or pastures. Most of these undertook two cultivation passes or less with only 14 thousand reporting three or more cultivations. Of agricultural businesses preparing land for crops or pastures, 40 thousand (53%) reported using zero-tillage.

## SUMMARY OF FINDINGS *continued*

### TILLAGE & FALLOW LAND

*continued*

Nationally 17 million hectares was prepared using zero-till compared with 9 million hectares prepared using one or more cultivation passes. Western Australia performed zero-till on the largest area of land prepared for crops and/pastures (6 million hectares) and the Northern Territory the smallest area (8 thousand hectares).

Of Australia's cropping land left fallow, 22 million hectares was left fallow for 3 to 9 months. New South Wales accounted for a third of the 2 million hectares left fallow for more than 9 months.

### CROP RESIDUE

Of all agricultural businesses managing crop residue, the main crop residue management practices undertaken were to leave stubble intact (43%), removal of crop residue by baling or heavy grazing (34%) and ploughing crop residue into the soil (33%). These management practices were used on 90% of all land managed for crop residue in 2007–08.

Although most states and territories followed the national trend, nearly two thirds of agricultural businesses in Western Australia that managed crop residue on their land left stubble intact (63%), while only 14% ploughed crop residue into the soil. In Queensland, the most common crop residue management practice undertaken was to plough crop residue into the soil (53% of agricultural businesses managing crop residue).

### GROUND COVER

Of agricultural businesses grazing livestock on crops or pasture, 69% monitor the amount of ground cover in paddocks and 57% of these have established a minimum ground cover level target. Queensland reported the highest proportion (65%) of agricultural businesses with a target for minimum ground cover levels, while in the Northern Territory only 33% reported minimum ground cover targets.

By far the most common method undertaken by agricultural businesses for monitoring ground cover was visual estimates, with 96% reporting using this method. This proportion was generally reflected in all states except the Northern Territory where 17% reported using photo monitoring standards (comparison with photos of known ground cover levels) to monitor ground cover.

### FERTILISER USAGE

A large proportion (62%) of agricultural businesses in Australia applied fertiliser to their holding between 1 July 2007 and 30 June 2008. The highest percentage of fertiliser use by agricultural businesses was reported in Western Australia (79%) and the lowest was reported in Queensland (44%).

The most common types of fertiliser used were urea and single superphosphate (both used by approximately 32% of all agricultural businesses reporting fertiliser use). However, the type of fertiliser used varied between different states and territories. In Queensland, agricultural businesses reporting fertiliser use had a higher usage of urea (50%) and other manufactured fertilisers (44%), while only 7% reported using single superphosphate. The use of other manufactured fertilisers was also common in the Northern Territory (53%), Western Australia (51%) and Tasmania (41%).

Nationally, the average application rates for manufactured fertilisers ranged between 0.07 and 0.14 tonnes per hectare. The application rate for animal manure was 3.19 tonnes per hectare.

## SUMMARY OF FINDINGS *continued*

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### SOIL ACIDITY

In 2007–08, 17% of all agricultural businesses reported undertaking activities to prevent or manage soil acidity. The highest proportion of agricultural businesses managing soil acidity were in Tasmania (33%), Western Australia (27%) and Victoria (21%).

The most common activities to manage soil acidity were the application of lime and dolomite. Victoria and Western Australia reported the highest proportion of agricultural businesses managing soil acidity by applying lime (86% and 85% respectively). Tasmania reported the highest proportion of agricultural businesses applying dolomite to prevent or manage soil acidity (41%).

While the application of soil conditioners was the dominant activity undertaken to prevent or manage soil acidity, 15% of agricultural businesses managing soil acidity reported changing the type of fertiliser used and 8% used other methods.

## SUMMARY OF FINDINGS *continued*

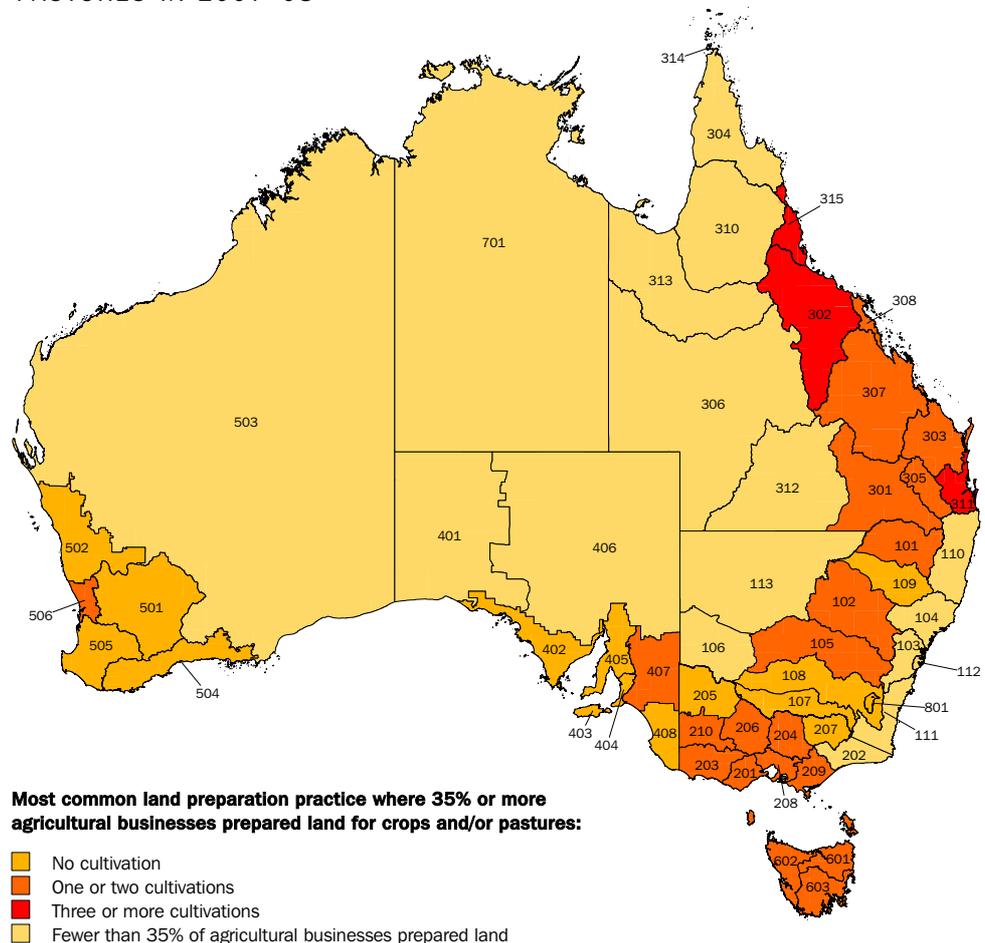
### MANAGEMENT PRACTICES UNDERTAKEN IN NRM REGIONS

#### *Preparing land for crops or pastures<sup>1</sup>*

Map 1 shows the most common land preparation practice reported by agricultural businesses that prepared land for crops and pastures in 2007–08. In this case, the most common practice refers to the practice that is reported by the largest number of agricultural businesses within a Natural Resource Management (NRM) region. Common practices are not shown for NRM regions where fewer than 35% of agricultural businesses reported preparing land for crops and pastures.

The use of no cultivation (zero-till) or one or two cultivation passes are the most common practices in most NRM regions. Three or more cultivation passes is the predominant practice in only a few NRM regions located in Queensland. There are fewer than 35% of agricultural businesses preparing land for crops and pastures across most of central and northern Australia as well as coastal NSW and Victoria.

**1** AGRICULTURAL BUSINESSES PREPARING LAND FOR CROPS OR PASTURES IN 2007–08



<sup>1</sup> Data for NRM regions 401 and 406 in South Australia, and regions 108 and 801 in New South Wales have been combined. In both instances, the individual regions reflect combined data.

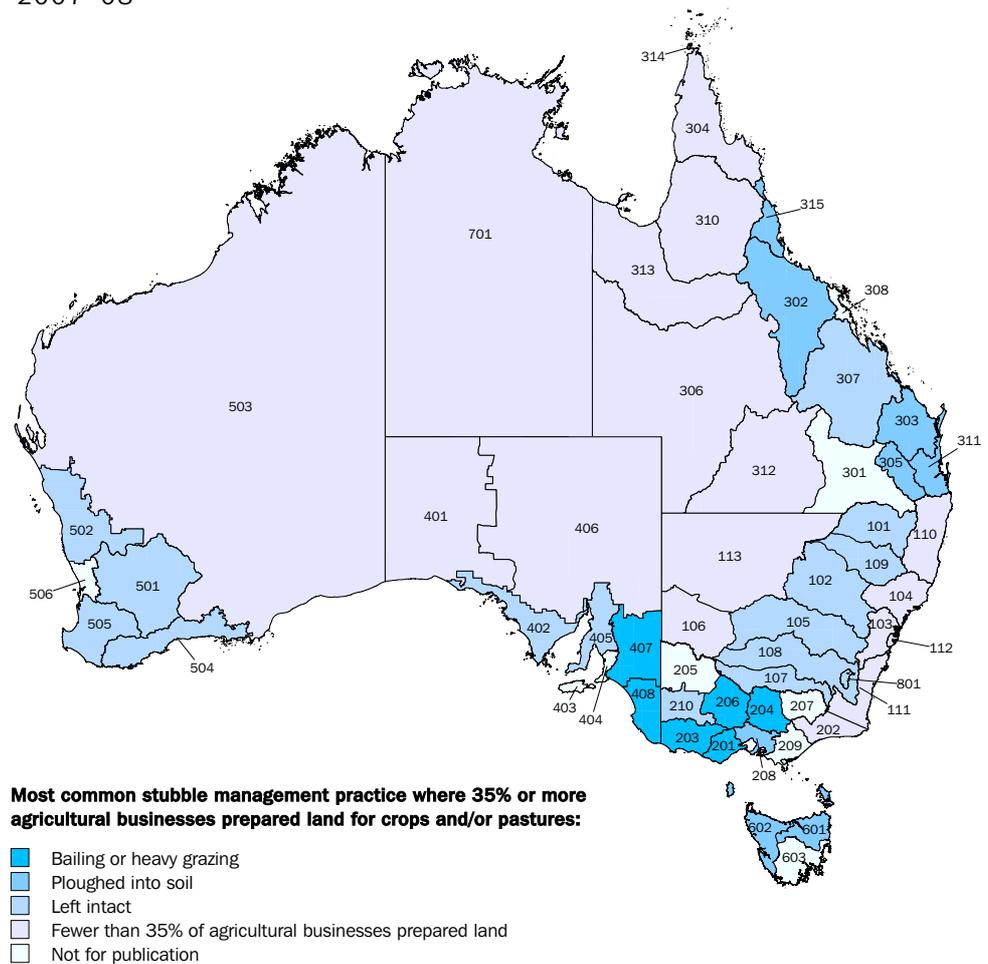
## SUMMARY OF FINDINGS *continued*

### *Undertaking stubble management<sup>2</sup>*

Map 2 shows the most common stubble management practice reported by agricultural businesses that prepared land for crops and pasture in 2007–08.

In a number of NRM regions, in New South Wales, Queensland, Western Australia, Victoria and South Australia, the predominant practice is for stubble to be left intact. There are several regions in Queensland and Tasmania where the most common practice is for stubble to be ploughed into the soil. Baling or heavy grazing is predominant in several NRM regions in South Australia and Victoria.

**2** AGRICULTURAL BUSINESSES UNDERTAKING STUBBLE MANAGEMENT IN 2007–08



<sup>2</sup> Data for NRM regions 401 and 406 in South Australia, and regions 108 and 801 in New South Wales have been combined. In both instances, the individual regions reflect combined data.

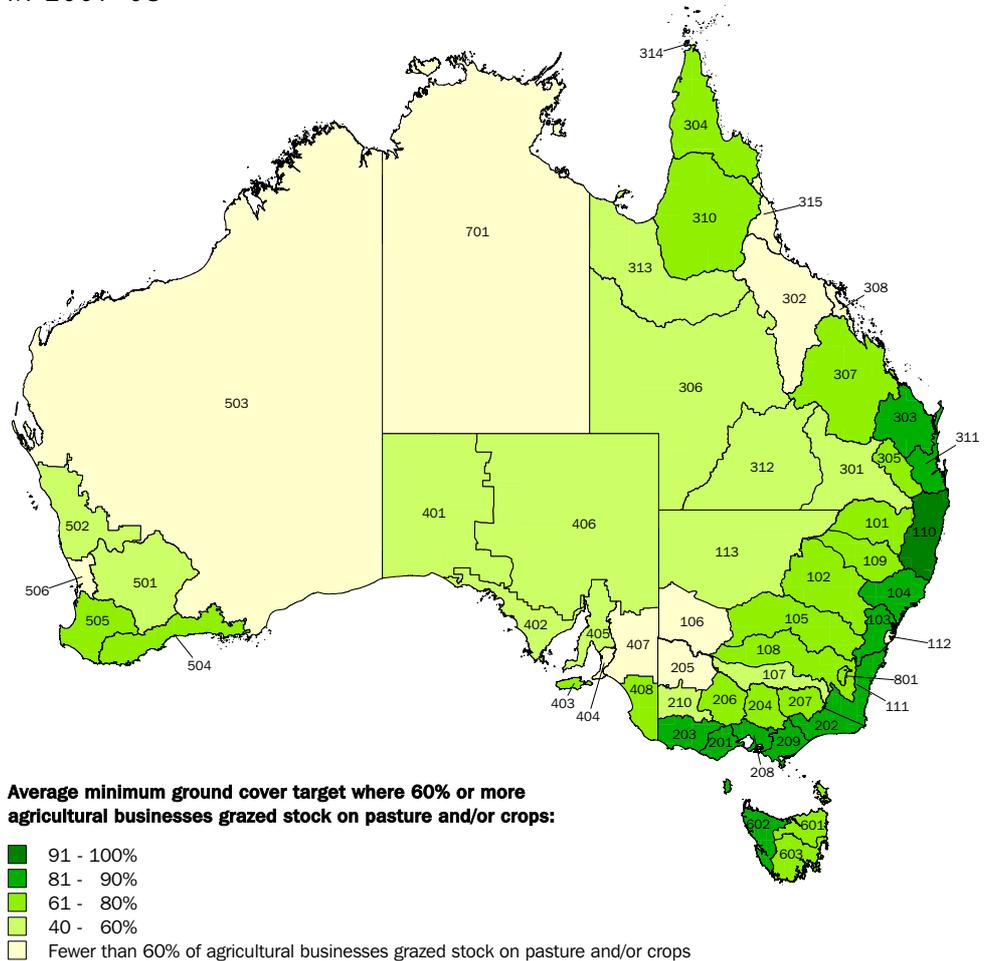
## SUMMARY OF FINDINGS *continued*

### Minimum ground cover targets<sup>3</sup>

Map 3 shows the average minimum ground cover target for agricultural businesses reporting a ground cover target. The map only shows NRM regions where 60% or more agricultural businesses reported grazing on crops or pastures. There are no NRM regions where the average minimum ground cover target is below 40%.

The map shows that the highest average ground cover targets (in excess of 80%) were reported in southern and eastern Australia. The average ground cover target was lower for the larger arid and semi-arid NRM regions in central and northern Australia. NRM regions in the grain and beef/sheep production zone around western Queensland, north-western New South Wales and northern South Australia reported average ground cover targets between 40% and 60%.

### 3 AGRICULTURAL BUSINESSES WITH A MINIMUM GROUND COVER TARGET IN 2007-08



<sup>3</sup> Data for NRM regions 401 and 406 in South Australia, and regions 108 and 801 in New South Wales have been combined. In both instances, the individual regions reflect combined data.

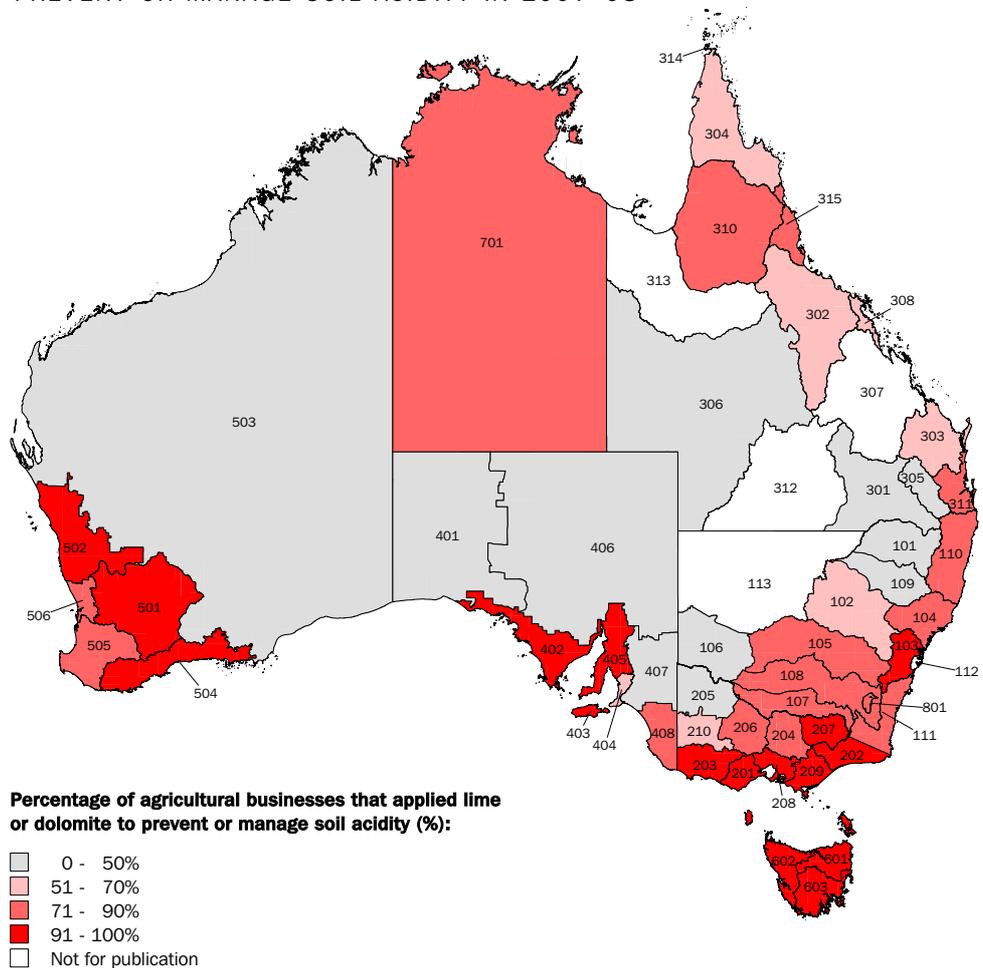
## SUMMARY OF FINDINGS *continued*

### *Managing soil acidity with lime or dolomite*<sup>4</sup>

Map 4 shows agricultural businesses applying lime or dolomite as a percentage of agricultural businesses reporting undertaking activities to prevent or manage soil acidity. The application of soil conditioners (specifically lime and dolomite) is the most common method of preventing and managing soil acidification.

The highest percentage of agricultural businesses applying lime or dolomite in 2007–08 occurred in parts of southern Australia, particularly in Tasmania, South Australia, Western Australia and Victoria. These areas are more prone to soil acidity problems and therefore the use of lime or dolomite to manage these problems is more common. A lower percentage of agricultural businesses managing soil acidity applied lime or dolomite in the inland regions of Western Australia, South Australia, New South Wales and Queensland.

**4** AGRICULTURAL BUSINESSES APPLYING LIME OR DOLOMITE TO PREVENT OR MANAGE SOIL ACIDITY IN 2007–08



<sup>4</sup> Data for NRM regions 401 and 406 in South Australia, and regions 108 and 801 in New South Wales have been combined. In both instances, the individual regions reflect combined data.

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	NSW(a)	Vic.	Qld	SA	WA	Tas.	NT	Aust.
AGRICULTURAL BUSINESSES AND LAND AREA								
Agricultural businesses (no.)	44 521	34 177	29 121	14 996	13 084	4 200	605	140 704
Area of agricultural holdings ('000 ha)	58 154	12 536	141 058	47 076	93 035	1 541	^ 63 888	417 288
Total land area ('000 ha)(b)(c)	80 064	22 742	173 065	98 348	252 988	6 840	134 913	769 202
LAND USE ON AGRICULTURAL HOLDINGS (%) (d)								
Land for agricultural production								
Crops	16.7	37.8	2.4	11.6	10.7	7.4	^ 0.1	8.0
Grazing								
Improved pasture	26.0	43.1	23.0	9.2	^ 6.8	48.6	* 3.3	15.9
Other grazing land	52.3	12.0	71.0	74.5	75.5	25.2	93.3	71.3
Forestry plantation	* 0.2	* 0.5	* 0.1	* —	* 0.1	3.4	** —	^ 0.1
Other agricultural purposes	* 0.1	* 0.5	0.1	* 0.1	* —	^ 0.4	* —	^ 0.1
Land not for agricultural production								
Land set aside for conservation/protection purposes	^ 2.9	3.7	2.1	3.8	1.9	9.7	^ 0.6	2.2
Other land not used for agricultural production	2.0	2.4	^ 1.4	0.8	** 5.0	^ 5.2	** 2.7	* 2.5

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

\* estimate has a relative standard error of 25% to 50% and should be used with caution

\*\* estimate has a relative standard error greater than 50% and is considered too unreliable for general use

— nil or rounded to zero (including null cells)

(a) Includes ACT.

(b) Total land area refers to total land area of each state, including agricultural land. Source: Geoscience Australia (2005) GEODATA 100k Coastline database, 1993.

(c) Total area of Australia includes Jervis Bay.

(d) Land use areas as a percentage of area of agricultural holdings.

## AGRICULTURAL BUSINESSES(a)

	Total	Cropping	Horticulture	Grazing(b)
	no.	no.	no.	no.
Australia	140 704	69 859	23 625	97 025
NSW(c)	44 521	18 621	6 198	32 947
Border Rivers-Gwydir	3 215	1 437	*84	2 757
Central West	5 880	3 457	^ 490	5 069
Hawkesbury-Nepean	2 977	^ 393	1 224	1 472
Hunter-Central Rivers	4 224	^ 822	^ 597	3 211
Lachlan	5 107	3 528	^ 200	3 797
Lower Murray Darling	606	^ 68	378	221
Murray	2 973	2 156	^ 179	2 185
Murrumbidgee(c)	5 863	3 166	974	3 809
Namoi	3 151	1 686	*98	2 517
Northern Rivers	7 607	1 312	1 698	5 555
Southern Rivers	2 060	^ 476	^ 172	1 756
Sydney Metro	^ 214	*15	^ 99	*43
Western	643	^ 105	^ 6	555
Vic.	34 177	20 070	4 864	24 342
Corangamite	3 306	2 160	^ 322	2 771
East Gippsland	918	^ 376	^ 75	802
Glenelg Hopkins	4 147	3 033	*101	3 780
Goulburn Broken	5 209	2 606	^ 635	3 641
Mallee	2 591	1 105	1 390	^ 514
North Central	4 625	3 021	^ 596	3 141
North East (Vic.)	2 686	1 240	^ 299	2 276
Port Phillip and Westernport	4 367	1 760	1 236	2 458
West Gippsland	4 032	2 830	^ 170	3 566
Wimmera	2 296	1 939	*38	1 394
Qld	29 121	10 831	4 433	19 213
Border Rivers Maranoa-Balonne	2 715	1 008	^ 306	2 187
Burdekin	1 760	657	^ 352	879
Burnett Mary	5 143	1 622	833	3 567
Cape York	57	^ 11	^ 13	41
Condamine	4 198	2 597	^ 131	2 932
Desert Channels	774	21	—	744
Fitzroy	3 721	874	^ 194	3 215
Mackay Whitsunday	1 564	1 191	*82	^ 595
Northern Gulf	445	^ 114	173	269
South East (Qld)	4 972	1 206	1 480	2 933
South West (Qld)	558	^ 12	**14	532
Southern Gulf	411	^ 24	—	391
Torres Strait	—	—	—	—
Wet Tropics	2 801	1 494	855	930
SA	14 996	8 641	4 331	8 203
Eyre Peninsula	1 413	1 281	^ 9	879
Kangaroo Island	307	218	^ 22	277
Adelaide and Mount Lofty Ranges	3 137	1 047	1 693	1 166
Northern and Yorke	2 984	2 466	^ 313	1 645
SA Arid Lands(d)	142	6	*1	134
SA Murray Darling Basin	4 269	1 817	1 919	1 816
South East (SA)	2 745	1 805	374	2 286

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

\* estimate has a relative standard error of 25% to 50% and should be used with caution

\*\* estimate has a relative standard error greater than 50% and is considered too unreliable for general use

— nil or rounded to zero (including null cells)

(a) Many agricultural businesses undertake more than one major agricultural activity. Therefore the sum of the agricultural businesses undertaking major agricultural activities may exceed the total number of agricultural businesses.

(b) Includes cattle and sheep grazing only.

(c) Includes ACT.

(d) Includes Alinytjara Wilurara

## AGRICULTURAL BUSINESSES(a)

	Total	Cropping	Horticulture	Grazing(b)
	no.	no.	no.	no.
Australia <i>cont.</i>	140 704	69 859	23 625	97 025
WA	13 084	8 840	2 395	8 663
Avon	2 668	2 486	*46	1 705
Northern Agricultural	1 327	1 125	*43	871
Rangelands (WA)	560	^ 60	233	285
South Coast	2 341	1 724	^ 181	1 848
South West	4 583	2 950	1 097	3 373
Swan	1 606	494	796	581
Tas.	4 200	2 730	1 105	3 389
North (Tas.)	1 523	1 127	^ 319	1 319
North West (Tas.)	1 461	1 050	360	1 216
South (Tas.)	1 216	552	427	854
NT	605	^ 126	298	268
Northern Territory	605	^ 126	298	268

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

\* estimate has a relative standard error of 25% to 50% and should be used with caution

(a) Many agricultural businesses undertake more than one major agricultural activity. Therefore the sum of the agricultural businesses undertaking major agricultural activities may exceed the total number of agricultural businesses.

(b) Includes cattle and sheep grazing only.

## 3

## LAND MANAGEMENT PRACTICES, by State—2007–08

NSW(a) Vic. Qld SA WA Tas. NT Aust.

## CHANGES TO LAND MANAGEMENT PRACTICES IN LAST 5 YEARS

Agricultural businesses (no.)	44 521	34 177	29 121	14 996	13 084	4 200	605	140 704
Made one or more management changes in last 5 years (no.)	28 598	21 534	18 845	8 951	8 172	2 489	^ 278	88 867
Made one or more management changes in last 5 years (%)	64.2	63.0	64.7	59.7	62.5	59.3	46.0	63.2

## LAND MANAGEMENT PRACTICES UNDERTAKEN, 2007–08 (%) (b)

Cultivation undertaken	33.8	36.6	42.7	36.2	33.4	44.1	^ 21.4	36.8
Crop residue modified or removed	27.2	28.6	30.2	32.5	30.9	28.0	* 10.5	29.0
Activities to manage soil acidity	15.2	21.3	11.4	8.2	27.2	32.7	^ 13.1	16.8
Activities to manage soil salinity	7.5	8.5	4.0	12.7	16.5	^ 5.5	* 4.7	8.3
Applied fertiliser to holding	58.0	67.8	44.3	73.9	79.2	74.3	57.2	61.7
Monitored ground cover in paddocks	59.3	53.5	53.2	45.7	54.5	50.9	^ 35.5	54.4
Surface water management	78.8	67.8	81.8	59.1	79.4	70.6	63.5	74.4
Intensive effluent management	6.0	16.9	6.1	5.7	4.6	13.1	* 4.1	8.7

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

(a) Includes ACT.

\* estimate has a relative standard error of 25% to 50% and should be used with caution

(b) Land management practices undertaken as a percentage of total agricultural businesses.

## 4

## LAND MANAGEMENT PRACTICES TO PROTECT THE NATURAL ENVIRONMENT, by State—2007–08

NSW(a) Vic. Qld SA WA Tas. NT Aust.

## PROTECTION OF THE NATURAL ENVIRONMENT

## Agricultural businesses (no.)

Agricultural businesses	44 521	34 177	29 121	14 996	13 084	4 200	605	140 704
Native vegetation on holding	30 556	18 064	21 476	9 020	9 964	2 621	464	92 164
Wetlands on holding	3 847	3 504	2 543	1 634	2 302	^ 463	^ 176	14 470
Rivers or creeks on holding	26 257	14 215	17 555	4 735	7 394	2 926	^ 268	73 351

## Undertook activities to protect natural environment areas (%)

Protected native vegetation (b)	45.3	56.4	48.3	57.6	63.5	49.3	^ 49.1	51.5
Protected wetland areas (c)	38.8	45.4	41.8	44.5	55.8	^ 51.7	^ 44.3	44.7
Protected river and creek banks (d)	42.7	59.1	51.4	39.4	53.6	50.2	^ 33.8	49.1

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

(c) Number of agricultural businesses reporting protection of wetlands on holding as a percentage of agricultural businesses reporting wetlands on holding.

(a) Includes ACT.

(b) Number of agricultural businesses reporting protection of native vegetation on holding as a percentage of agricultural businesses reporting native vegetation on holding.

(d) Number of agricultural businesses reporting protection of river or creek banks on holding as a percentage of agricultural businesses reporting rivers or creeks on holding.

LAND PREPARATION FOR CROPS AND PASTURES, by State—2007–08

	NSW(a)	Vic.	Qld	SA	WA	Tas.	NT	Australia
AGRICULTURAL BUSINESSES AND LAND AREA								
Agricultural businesses (no.)	44 521	34 177	29 121	14 996	13 084	4 200	605	140 704
Agricultural businesses preparing land for crops and pastures (no.)	23 072	17 761	14 308	9 055	8 618	2 135	^ 205	75 154
Total area of land prepared for crops and pastures ('000 ha)	7 788.9	4 019.8	2 697.8	4 346.2	7 969.1	94.7	*18.7	26 935.2
LAND PREPARED FOR CROPS AND PASTURES (b)								
Agricultural businesses preparing land (no.)								
No cultivation	13 544	9 480	4 538	5 474	5 708	^ 659	^ 103	39 505
One or two cultivations only	12 722	10 565	7 622	4 952	4 025	1 237	^ 107	41 231
Three or more cultivations	3 309	2 783	5 813	^ 644	^ 411	914	*24	13 899
Area prepared ('000 ha)								
No cultivation	4 460.8	2 523.3	1 257.6	2 890.2	6 313.7	^ 26.5	*8.0	17 480.3
One or two cultivations only	2 820.0	1 202.2	1 013.7	1 388.1	1 614.3	37.1	**9.9	8 085.3
Three or more cultivations	508.1	^ 294.3	426.4	^ 67.8	^ 41.1	31.1	*0.8	1 369.6
<p>^ estimate has a relative standard error of 10% to less than 25% and should be used with caution</p> <p>* estimate has a relative standard error of 25% to 50% and should be used with caution</p> <p>** estimate has a relative standard error greater than 50% and is considered too unreliable for general use</p> <p>(a) Includes ACT.</p> <p>(b) Some agricultural businesses undertake different cultivation practices on different parts of their land. Therefore the sum of the land preparation practices may exceed the number of agricultural businesses preparing land for crops and pastures.</p>								

CROPPING LAND FALLOW PERIOD, by State—2007–08

	NSW(a)	Vic.	Qld	SA	WA	Tas.	NT	Aust.
AGRICULTURAL BUSINESSES AND LAND AREA								
Agricultural businesses (no.)	44 521	34 177	29 121	14 996	13 084	4 200	605	140 704
Agricultural businesses leaving cropping land fallow between crops (no.)	16 774	13 069	10 823	7 460	7 355	1 434	^120	57 036
Total area of cropping land fallow between crops ('000 ha)(b)	7 427.0	3 874.7	2 366.8	4 290.6	7 804.2	67.4	*12.6	25 843.2
CROPPING LAND FALLOW PERIOD (c)								
Agricultural businesses with cropping land fallow (no.)								
Less than 3 months	3 643	3 139	2 157	847	604	829	*30	11 250
3 to 9 months	12 749	9 724	7 117	6 518	6 369	np	np	43 193
More than 9 months	2 450	^1 261	3 480	^543	771	np	np	8 682
Area of cropping land fallow ('000 ha)								
Less than 3 months	538.5	^439.8	193.3	^387.9	^369.2	37.6	*1.3	1 967.6
3 to 9 months	6 172.1	3 237.9	1 542.3	3 729.4	7 061.8	np	np	21 782.0
More than 9 months	716.5	^197.0	631.3	^173.3	373.1	np	np	2 093.6

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

\* estimate has a relative standard error of 25% to 50% and should be used with caution

np not available for publication but included in totals where applicable, unless otherwise indicated

(a) Includes ACT.

(b) Excludes areas under pasture.

(c) Some agricultural businesses may fallow different sections of land for different periods of time. Therefore the sum of the number of agricultural businesses reporting specific land fallow periods may exceed the number of agricultural businesses leaving land fallow between crops.

	NSW(a)	Vic.	Qld	SA	WA	Tas.	NT	Aust.
AGRICULTURAL BUSINESSES								
Agricultural businesses (no.)	44 521	34 177	29 121	14 996	13 084	4 200	605	140 704
Agricultural businesses managing crop residue (no.)	16 525	12 243	10 682	7 332	7 055	1 283	^ 99	55 219

CROP RESIDUE MANAGEMENT PRACTICES USED (%) (b)(c)								
Stubble was left intact (no cultivation)	44.8	37.1	32.0	50.0	62.5	^ 16.8	*37.5	42.9
Most stubble or trash removed by baling or heavy grazing	35.8	44.2	16.9	38.9	29.2	np	np	33.6
Stubble or trash removed by a hot burn (early season)	^ 3.2	^ 2.9	^ 4.5	*2.1	^ 6.6	np	np	3.8
Stubble or trash removed by a cool burn (late season)	5.6	^ 10.1	^ 3.6	^ 8.9	16.1	np	np	8.0
Stubble or trash was ploughed into the soil	35.2	27.4	53.2	21.5	13.7	np	np	32.7
Stubble or trash was mulched	8.8	^ 9.0	19.8	^ 9.7	^ 3.4	np	np	10.5

AREA OF CROP RESIDUE MANAGEMENT ('000 ha)								
Stubble was left intact (no cultivation)	3 548.6	1 913.1	1 183.5	2 430.7	5 304.6	^ 10.7	**8.4	14 399.6
Most stubble or trash removed by baling or heavy grazing	1 463.8	860.5	160.2	855.8	997.6	np	np	4 358.2
Stubble or trash removed by a hot burn (early season)	^ 53.1	^ 56.5	^ 25.1	^ 14.7	^ 204.7	np	np	^ 356.1
Stubble or trash removed by a cool burn (late season)	^ 102.9	^ 184.7	^ 23.3	^ 72.2	360.1	np	np	745.5
Stubble or trash was ploughed into the soil	1 581.7	436.0	688.7	^ 453.5	387.5	np	np	3 569.9
Stubble or trash was mulched	^ 399.4	^ 266.9	273.7	^ 238.7	^ 106.1	np	np	1 288.9
<b>Total</b>	<b>7 149.5</b>	<b>3 717.7</b>	<b>2 354.5</b>	<b>4 065.5</b>	<b>7 360.6</b>	<b>59.5</b>	<b>**10.9</b>	<b>24 718.2</b>

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\* estimate has a relative standard error of 25% to 50% and should be used with caution

\*\* estimate has a relative standard error greater than 50% and is considered too unreliable for general use

np not available for publication but included in totals where applicable, unless otherwise indicated

(a) Includes ACT.

(b) Number of agricultural businesses reporting a specific crop residue management practice as a percentage of agricultural businesses reporting crop residue management.

(c) Some agricultural businesses undertake more than one crop residue management practice. Therefore the sum of the crop residue management practices may exceed the number of agricultural businesses managing crop residue.

NSW(a) Vic. Qld SA WA Tas. NT Aust.

AGRICULTURAL BUSINESSES

Agricultural businesses (no.)	NSW(a)	Vic.	Qld	SA	WA	Tas.	NT	Aust.
Agricultural businesses	44 521	34 177	29 121	14 996	13 084	4 200	605	140 704
Grazed stock on pastures and crops	36 991	27 911	21 418	9 846	10 336	3 776	307	110 585
Monitor ground cover in paddocks	26 387	18 268	15 479	6 859	7 132	2 138	^ 215	76 479
Have a minimum target for ground cover levels	15 987	9 189	9 986	3 478	3 572	1 068	*70	43 351
Agricultural businesses grazing stock (%)								
Grazed stock on pastures and crops(b)	83.1	81.7	73.6	65.7	79.0	89.9	50.7	78.6
Monitor ground cover in paddocks(c)	71.3	65.5	72.3	69.7	69.0	56.6	70.0	69.2
Have a minimum target for ground cover levels(d)	60.6	50.3	64.5	50.7	50.1	50.0	^ 32.8	56.7

MAIN METHOD FOR MONITORING GROUND COVER (%) (e)

Visual estimates	96.2	np	95.6	97.0	97.9	97.2	np	96.4
Step pointing	^ 1.2	*0.8	**0.1	*0.3	np	np	—	^ 0.7
Photo monitoring standards	*0.5	np	^ 1.6	*0.9	np	—	*16.8	^ 0.7
Counting number of plants within a defined area	^ 1.2	**0.4	^ 1.5	*1.2	*1.0	^ 0.3	—	^ 1.0
Other	*0.8	^ 1.9	*1.2	*0.6	*0.8	np	np	^ 1.2

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- \*\* estimate has a relative standard error greater than 50% and is considered too unreliable for general use
- nil or rounded to zero (including null cells)
- np not available for publication but included in totals where applicable, unless otherwise indicated
- (a) Includes ACT.
- (b) Agricultural businesses grazing stock on pastures and crops as a percentage of total agricultural businesses.
- (c) Agricultural businesses monitoring ground cover in paddocks as a percentage of agricultural businesses grazing stock on pastures and crops.
- (d) Agricultural businesses with a minimum target for ground cover levels as a percentage of agricultural businesses monitoring ground cover in paddocks.
- (e) Main method for monitoring ground cover as a percentage of agricultural businesses monitoring ground cover.

FERTILISER USE, by State—2007–08

	NSW(a)	Vic.	Qld	SA	WA	Tas.	NT	Aust.
AGRICULTURAL BUSINESSES								
Agricultural businesses (no.)	44 521	34 177	29 121	14 996	13 084	4 200	605	140 704
Agricultural businesses reporting fertiliser use (no.)	25 816	23 186	12 896	11 081	10 365	3 119	346	86 808
Agricultural businesses reporting fertiliser use (%)	58.0	67.8	44.3	73.9	79.2	74.3	57.2	61.7
TYPES OF FERTILISER USED (%) (b)(c)								
Urea	24.5	28.1	50.1	31.3	39.4	36.9	^ 25.8	32.4
Ammonium sulphate	4.4	^ 3.3	^ 5.8	^ 5.7	13.7	^ 1.5	* 5.0	5.5
Urea ammonium nitrate	^ 2.8	^ 2.3	^ 2.1	np	12.7	np	** 4.5	4.0
Anhydrous ammonia	^ 1.9	** 0.1	^ 3.2	np	* 0.5	np	—	1.1
Single superphosphate	35.5	44.8	7.4	23.9	32.4	54.2	* 14.4	32.5
Double or triple superphosphate	9.4	9.7	^ 3.1	13.3	11.2	^ 11.8	* 12.3	9.3
Muriate of potash or sulphate of potash	^ 4.6	10.4	14.6	^ 3.8	22.9	20.7	* 16.9	10.3
Potassium nitrate	3.4	^ 2.5	8.2	^ 4.9	^ 5.5	^ 4.9	^ 28.6	4.5
Ammonium phosphates	31.2	25.3	18.1	44.3	22.7	^ 8.7	* 9.5	27.4
All other manufactured fertilisers	21.1	24.5	43.7	19.8	50.7	40.5	^ 52.6	29.6
Animal manure	13.0	10.6	14.2	15.1	^ 5.7	^ 6.8	* 16.7	11.7

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— nil or rounded to zero (including null cells)

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(a) Includes ACT.

(b) Number of agricultural businesses reporting a specific fertiliser use as a percentage of agricultural businesses reporting fertiliser use.

(c) Some agricultural businesses use more than one type of fertiliser. Therefore the sum of the types of fertiliser used may exceed the number of agricultural businesses reporting fertiliser use.

	NSW(a)	Vic.	Qld	SA	WA	Tas.	NT	Aust.
<b>Urea</b>								
Area ('000 ha)	1 262.5	1 174.3	793.0	1 075.7	3 597.1	71.4	*2.7	7 976.7
Amount ('000 t)	161.8	145.6	147.3	np	261.2	np	*0.4	816.2
Application rate (t/ha)	0.13	0.12	0.19	np	0.07	np	^ 0.15	0.10
<b>Ammonium sulphate</b>								
Area ('000 ha)	^ 167.7	^ 264.1	^ 47.2	^ 209.2	890.8	^ 0.9	^ 0.7	1 580.6
Amount ('000 t)	24.8	^ 22.4	^ 6.9	^ 19.5	92.2	^ 0.2	^ 0.1	166.2
Application rate (t/ha)	0.15	0.08	0.15	^ 0.09	0.10	0.28	0.09	0.11
<b>Urea ammonium nitrate</b>								
Area ('000 ha)	^ 76.4	*81.3	^ 33.3	np	1 895.1	np	**2.1	2 182.2
Amount ('000 t)	^ 8.3	^ 7.3	^ 6.3	np	142.9	np	**0.4	174.9
Application rate (t/ha)	^ 0.11	*0.09	^ 0.19	np	0.08	np	**0.17	0.08
<b>Anhydrous ammonia</b>								
Area ('000 ha)	213.9	**7.9	153.2	np	*27.2	np	—	403.7
Amount ('000 t)	21.4	**0.4	^ 18.5	np	*2.5	np	—	43.0
Application rate (t/ha)	0.10	0.06	^ 0.12	np	^ 0.09	np	—	0.11
<b>Single superphosphate</b>								
Area ('000 ha)	1 797.5	1 902.4	^ 59.0	733.2	1 718.7	261.8	**5.1	6 477.5
Amount ('000 t)	226.8	291.2	^ 9.9	95.9	185.5	56.7	**0.4	866.2
Application rate (t/ha)	0.13	0.15	^ 0.17	0.13	0.11	0.22	*0.07	0.13
<b>Double or triple superphosphate</b>								
Area ('000 ha)	740.9	507.6	^ 61.1	^ 691.1	640.2	^ 17.6	**3.7	2 662.2
Amount ('000 t)	54.8	57.1	*5.5	^ 46.1	49.2	^ 4.7	*0.5	217.9
Application rate (t/ha)	0.07	0.11	^ 0.09	0.07	0.08	0.27	**0.12	0.08
<b>Muriate or sulphate of potash</b>								
Area ('000 ha)	^ 45.0	^ 295.5	128.5	^ 41.0	1 336.8	^ 54.1	*1.0	1 901.9
Amount ('000 t)	^ 7.7	39.4	23.2	^ 7.0	^ 83.3	^ 8.1	*0.1	168.8
Application rate (t/ha)	^ 0.17	0.13	0.18	0.17	0.06	^ 0.15	^ 0.10	0.09
<b>Potassium nitrate</b>								
Area ('000 ha)	^ 21.2	^ 57.7	^ 46.8	^ 28.8	*89.4	*5.0	^ 2.3	^ 251.2
Amount ('000 t)	^ 2.9	^ 9.3	7.7	^ 3.6	^ 6.5	*0.5	*0.3	30.8
Application rate (t/ha)	0.14	^ 0.16	^ 0.17	0.12	^ 0.07	*0.09	^ 0.13	0.12
<b>Ammonium phosphates</b>								
Area ('000 ha)	3 742.0	2 400.7	519.7	2 829.2	3 131.7	^ 13.2	^ 1.5	12 637.9
Amount ('000 t)	243.8	185.2	30.8	190.2	221.8	^ 3.4	*0.1	875.2
Application rate (t/ha)	0.07	0.08	0.06	0.07	0.07	0.26	^ 0.10	0.07
<b>All other manufactured fertilisers</b>								
Area ('000 ha)	769.2	896.8	476.6	572.0	3 929.6	133.8	*15.9	6 793.8
Amount ('000 t)	^ 113.9	191.3	161.1	60.1	404.4	42.3	*3.8	977.0
Application rate (t/ha)	^ 0.15	0.21	0.34	0.11	0.10	0.32	^ 0.24	0.14
<b>Animal manure</b>								
Area ('000 ha)	211.5	^ 183.7	115.9	^ 117.4	^ 78.7	^ 6.2	*4.1	717.5
Amount ('000 t)	^ 761.7	^ 412.0	^ 771.0	^ 177.0	^ 142.1	^ 18.5	**4.1	2 286.4
Application rate (t/ha)	3.60	^ 2.24	^ 6.65	^ 1.51	^ 1.80	3.00	^ 1.00	3.19

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\* estimate has a relative standard error of 25% to 50% and should be used with caution  
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— nil or rounded to zero (including null cells)  
np not available for publication but included in totals where applicable, unless otherwise indicated  
(a) Includes ACT.

	NSW(a)	Vic.	Qld	SA	WA	Tas.	NT	Aust.
AGRICULTURAL BUSINESSES								
Agricultural businesses (no.)	44 521	34 177	29 121	14 996	13 084	4 200	605	140 704
Undertook activities to prevent or manage soil acidity (no.)	6 756	7 268	3 317	1 233	3 562	1 374	^ 79	23 588
SOIL ACIDITY MANAGEMENT (%)								
Undertook activities to prevent or manage soil acidity(b)	15.2	21.3	11.4	8.2	27.2	32.7	^ 13.1	16.8
ACTIVITIES TO PREVENT OR MANAGE SOIL ACIDITY (%) (c)(d)								
Applied lime	71.9	86.3	57.9	np	84.5	71.3	np	75.9
Applied dolomite	^ 6.7	^ 5.6	^ 18.4	np	^ 10.7	41.4	np	10.7
Planted acid tolerant crops/pastures	^ 11.9	*2.6	*5.4	**4.1	*2.4	—	—	5.6
Changed fertiliser type	16.0	^ 13.4	^ 22.1	^ 23.4	^ 9.5	np	np	14.8
Other	^ 10.4	^ 4.7	^ 14.1	^ 12.4	^ 5.7	np	np	8.1

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\* estimate has a relative standard error of 25% to 50% and should be used with caution

\*\* estimate has a relative standard error greater than 50% and is considered too unreliable for general use

— nil or rounded to zero (including null cells)

np not available for publication but included in totals where applicable, unless otherwise indicated

(a) Includes ACT.

(b) Number of agricultural businesses undertaking activities to prevent or manage soil acidity as a percentage of all agricultural businesses.

(c) Number of agricultural businesses undertaking specific soil acidity management activities as a percentage of agricultural businesses undertaking soil acidity management activities.

(d) Some agricultural businesses undertake more than one soil acidity management activity. Therefore the sum of the soil acidity management activities may exceed the number of agricultural businesses reporting soil acidity management.

## EXPLANATORY NOTES

### INTRODUCTION

**1** Changes to the ABS Agricultural survey program for 2007–08 resulted in the annual Agricultural Survey being combined with a user-funded benchmark survey of land management practices by agricultural businesses, and a survey on management responses to adverse seasonal conditions experienced by affected agricultural businesses. The combined survey was the Agricultural Resource Management Survey (ARMS). The survey was designed to enable the benchmarking of several key aspects of the Caring for our Country program, an initiative of the Australian Government.

**2** This publication presents estimates from the 2007–08 ARMS. It contains detailed statistics at the national and state/territory levels, on the major agricultural activities undertaken, land use, and key land management practices. Additional datacubes at national, state/territory and NRM region levels provide a more detailed picture of land management and farming in Australia. These datacubes can be accessed via the Downloads tab of *Land Management and Farming in Australia, 2007–08* (cat. no. 4627.0).

**3** A reduced range of commodity items was collected from the 2007–08 ARMS in comparison to surveys and censuses of previous years. As a result, care must be taken when comparing estimates over time for Australia, state/territory and regional levels. More information is available upon request.

### GENERAL

**4** Where figures for individual states/territories have been suppressed for reasons of confidentiality, they have been included in relevant national totals. In addition, some categories have been combined, for example, combining Australian Capital Territory data with New South Wales data.

**5** Where figures have been rounded, discrepancies may occur between sums of the component items and totals.

**6** For some items, multiple responses are possible and thus totals are not necessarily the sum of the component items. For example, a respondent could perform more than one land management practice on their holding.

### SCOPE AND COVERAGE

**7** The scope of the 2007–08 ARMS was all agricultural businesses recorded on the ABS' Business Register (ABSBR) above a minimum size cut-off. The ABSBR is based on the Australian Business Register (ABR) which is administered and maintained by the Australian Taxation Office (ATO).

**8** A minimum cut-off of \$5,000 was applied to determine whether a business was in-scope for the 2007–08 ARMS. The measure of size was based on the ABS' Estimated Value of Agricultural Operations (EVAO) or a derived value based on Business Activity Statement (BAS) turnover.

**9** While the ABSBR does not include all agricultural businesses in Australia, it provides improved coverage from the former ABS-maintained Agricultural Survey frame as most businesses and organisations in Australia need to obtain an Australian Business Number (ABN) from the ATO for their business operations. The ABR-based register is also more up-to-date as it excludes agricultural businesses with cancelled ABNs and incorporates regularly updated information on agricultural businesses from the ATO.

**10** For the 2007–08 ARMS, a sample of approximately 33,000 agricultural businesses was selected from an in-scope population of approximately 150,000 agricultural businesses.

### RESPONSE RATE

**11** The response rate for 2007–08 ARMS was 87.4%

### RELIABILITY OF DATA

**12** The estimates in this publication are subject to sampling and non-sampling errors.

## EXPLANATORY NOTES *continued*

### SAMPLING ERRORS

**13** The estimates in this publication are based on information obtained from respondents to the ARMS for the year ended 30 June 2008 and are subject to sampling variability. That is, estimates may differ from figures that would be produced if all agricultural businesses had been included in the survey. One measure of the likely difference is given by the standard error (SE), which indicates the extent to which an estimate might vary by chance when not all units have responded, i.e. when a 'sample' of responses only is obtained. There are about two chances in three that a 'sample' estimate will differ by less than one SE from the figure that would have been obtained if all units had responded, and about nineteen chances in twenty that the difference will be less than two SEs.

**14** In this publication, 'sampling' variability of the estimates is measured by the relative standard error (RSE) which is obtained by expressing the RSE as a percentage of the estimates to which it refers.

**15** Most published estimates have RSEs less than 5%. Where the RSE of an estimate included in this publication falls in the range of 10% to less than 25%, it has been annotated with the symbol '^' indicating that the estimate should be used with caution as it is subject to sampling variability too high for some purposes. Where the RSE of an estimate is 25% to 50%, it has been annotated with the symbol '\*', indicating that the estimate should be used with caution as it is subject to sampling variability too high for most practical purposes. Where the RSE of an estimate exceeds 50%, it has been annotated with the symbol '\*\*', indicating that the sampling variability causes the estimate to be considered too unreliable for general use. Separate indication of the RSEs of all estimates is available on request.

**16** The following table contains estimates of RSEs for a selection of the statistics presented in this publication:

### RELATIVE STANDARD ERRORS OF SELECTED ESTIMATES, by State—2007–08

	Aust.	NSW(a)	Vic.	Qld	SA	WA	Tas.	NT
	%	%	%	%	%	%	%	%
Reporting fertiliser use (no. of businesses)	0.8	1.6	1.8	2.1	2.2	1.9	3.2	8.7
Grazing stock in pastures and/or crops (no. of businesses)	0.6	0.9	1.3	1.3	1.9	1.7	2.3	7.9
Monitoring ground cover in paddocks (no. of businesses)	1.0	1.5	2.4	2.0	3.0	2.8	4.8	12.4
Minimum target for ground cover levels (no. of businesses)	1.5	2.4	4.1	3.0	4.8	4.7	8.0	25.7
Native vegetation on holding (no. of businesses)	0.8	1.4	2.4	1.5	2.5	2.0	3.8	6.8
Wetlands on holding (no. of businesses)	2.9	5.7	6.8	6.2	7.4	6.5	12.4	14.5
Rivers or creeks on holding (no. of businesses)	1.0	1.5	2.7	1.8	3.9	2.7	3.4	10.4
Preparing land for crops and/or pastures (no. of businesses)	0.9	1.6	2.2	2.1	2.4	2.2	4.5	14.6
Stubble left intact (no cultivation) - ('000 ha)	1.8	3.6	6.5	3.3	4.5	2.8	10.5	71.9
Total area of stubble or trash ('000 ha)	1.2	2.4	3.7	2.4	3.3	2.2	4.6	55.8
Fallow land - less than 3 months ('000 ha)	5.1	7.8	11.4	7.9	16.4	10.7	6.5	35.9
Fallow land - 3 to 9 months ('000 ha)	1.4	2.6	4.1	3.1	3.2	2.3	6.7	56.7
Fallow land - more than 9 months ('000 ha)	4.2	7.2	23.2	5.0	19.4	8.7	16.5	35.5

(a) Includes ACT.

### NON-SAMPLING ERRORS

**17** Errors other than those due to sampling may occur because of deficiencies in the list of units from which the sample was selected, non-response, and errors in reporting by providers. Inaccuracies of this kind are referred to as non-sampling error, which may occur in any collection, whether it be a census or a sample. Every effort has been made to reduce non-sampling error to a minimum by careful design and testing of questionnaires, operating procedures and systems used to compile the statistics.

### RELATED PUBLICATIONS

**18** A range of environmental and agricultural publications are produced by the ABS, including:

- *Agricultural Commodities, Australia* (cat. no. 7121.0)

## EXPLANATORY NOTES *continued*

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### RELATED PUBLICATIONS

*continued*

- *Farm Management and Climate* (cat. no. 4625.0)
- *Natural Resource Management on Australian Farms* (cat. no. 4620.0)
- *Principal Agricultural Commodities, Australia, Preliminary* (cat. no. 7111.0)
- *Water use on Australian Farms* (cat. no. 4618.0)

**19** For more information please refer to the ABS web site <<http://www.abs.gov.au>>. The ABS also issues a daily Release Advice on the web site which details products to be released in the week ahead. All ABS publications are available free of charge from the ABS website.

### ABS DATA AVAILABLE ON REQUEST

**20** As well as the statistics included in this and related publications, the ABS may have other relevant data available on request. Inquiries should be made to the National Information and Referral Service on 1300 135 070.

### GENERAL ACKNOWLEDGMENT

**21** ABS publications draw extensively on information provided freely by individuals, businesses, governments and other organisations. Their continued cooperation is very much appreciated. Without it, the wide range of statistics published by the ABS would not be available. Information received by the ABS is treated in strict confidence, as required by the *Census and Statistics Act 1905*.

### ABBREVIATIONS

'000	thousand
ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
Aust.	Australia
ha	hectare
m	million
no.	number
NRM	natural resource management
NSW	New South Wales
NT	Northern Territory
Qld	Queensland
RSE	relative standard error
SA	South Australia
SE	standard error
Tas.	Tasmania
Vic.	Victoria
WA	Western Australia







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*PHONE*                      1300 135 070

*EMAIL*                      [client.services@abs.gov.au](mailto:client.services@abs.gov.au)

*FAX*                              1300 135 211

*POST*                          Client Services, ABS, GPO Box 796, Sydney NSW 2001

## FREE ACCESS TO STATISTICS

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*WEB ADDRESS*      [www.abs.gov.au](http://www.abs.gov.au)