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WATER USE ON AUSTRALIAN FARMS

PRELIMINARY

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BACKGROUND

The agriculture industry is a major consumer of water in the Australian economy. The *Water Account, Australia 2004–05* (cat. no. 4610.0) showed agriculture to account for 65% of all water consumed in 2004–05.

This publication presents preliminary estimates of agricultural water use, pastures and crops irrigated, and sources of water used for agriculture at a national and state/territory level compiled from data collected as part of the Agricultural Census for the year ended 30 June 2006. Estimates for 2002–03, 2003–04 and 2004–05 are also included in this publication of total water use for Australia and states/territories.

Final estimates at the national, state/territory and regional level will be released in December 2007.

Climatic conditions affect both the availability of water for irrigation and the need to irrigate in order to supplement rainfall. Information from the Bureau of Meteorology outlining climatic conditions over key agricultural areas between July 2005 and June 2006 are presented as an appendix.

CHANGES IN THIS ISSUE

Move to a new register of agricultural businesses

Prior to running the 2005–06 Agricultural Census, the ABS had maintained its own register of agricultural establishments. For the 2005–06 Agricultural Census, the ABS has adopted a new frame based on the Australian Taxation Office's Australian Business Register (ABR). The ABR-based register used for the 2005–06 Agricultural Census has improved the coverage of agricultural businesses and is easier to maintain.

Due to the adoption of a new register of agricultural businesses and differences in data compilation methodology for the Agricultural Census, the 2005–06 estimates are not directly comparable with historical time series.

To provide users with a way of comparing the 2005–06 estimates with historical time series, the ABS has prepared two sets of 2005–06 estimates. 'New-basis' estimates have been prepared to represent the start of a new water use series, and these have been subjected to rigorous analysis and testing. 'Old-basis' estimates have been prepared to provide a best judgement approximation to what the various water estimates may have been if the ABS had continued to use the previous ABS-maintained list of establishments (with its associated statistical methodologies) to conduct the 2005–06 Agricultural Census. Due to the complexities involved in collecting, processing and estimating 'old-basis' data from a 'new-basis' framework, the 'old-basis' 2005–06 estimates and the movements between 2004–05 and 2005–06 should be considered indicative only.

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Australian Statistician

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CHAPTER 1

SUMMARY OF FINDINGS

AGRICULTURAL WATER USE

In 2005–06, Australian agricultural establishments used 11,905 gigalitres of water for agricultural production. Of this, 10,845 gigalitres (91.1%) was used for the irrigation of pastures and crops, and 1,060 gigalitres (8.9%) was used for other agricultural purposes such as stock watering and the cleaning of dairies and piggeries.

1.1 AGRICULTURAL WATER USE, By State—2005–06

WATER USE				
	<i>Agricultural establishments</i>	<i>Irrigation</i>	<i>Other agricultural uses</i>	<i>Total</i>
	no.	ML	ML	ML
NSW(a)	48 550	4 472 617	284 166	4 756 784
Vic.	36 993	2 470 542	217 874	2 688 415
Qld	32 871	2 435 215	279 654	2 714 868
SA	16 457	927 264	93 342	1 020 606
WA	14 816	317 703	144 860	462 563
Tas.	4 716	201 822	26 643	228 465
NT	648	19 546	13 621	33 167
Aust.	155 052	10 844 708	1 060 161	11 904 869

(a) Includes ACT.

In all states and territories, irrigation was the major use of water by the agricultural sector. In New South Wales, Victoria and Queensland, irrigation accounted for 94.0%, 91.9% and 89.7% of agricultural water use respectively, while in the Northern Territory and Western Australia other agricultural uses accounted for 41.1% and 31.3% of total agricultural water use respectively.

IRRIGATION WATER USE

At the Australian level, 45,130 or 29.1% of agricultural establishments reported using water for irrigation purposes. Increases in the number of agricultural establishments using water for irrigation purposes, and the increase in total number of agricultural establishments to 155,052, reflects the inclusion of additional agricultural establishments in the new ABR-based register of agricultural establishments.

At the state/territory level, the Northern Territory reported the highest proportion of farms irrigating (54.3%), followed by Tasmania (40.6%) and South Australia (38.4%). Western Australia reported the smallest percentage of farms irrigating (21.9%).

Victoria had 25.8% of the nations irrigating establishments, followed by New South Wales (25.3%) and Queensland (22.6%).

IRRIGATION WATER USE

continued

New South Wales, Victoria and Queensland continued to be the major users of water for irrigation, accounting for 86.5% of all water used for irrigation purposes nationally. New South Wales used 4,473 gigalitres (41.2% of all water used for irrigation purposes nationally) followed by Victoria with 2,471 gigalitres (22.8%) and Queensland with 2,435 gigalitres (22.5%). Across Australia, 2,583,000 hectares of agricultural land was irrigated at an average application rate of 4.2 ML/ha. This application rate was unchanged from the previous year.

In New South Wales, 986,000 hectares of agricultural land was irrigated (38.2% of irrigated agricultural land nationally), followed by Victoria with 657,000 hectares (25.4%) and Queensland with 572,000 hectares (22.1%). Combined, these three eastern states accounted for 85.7% of irrigated agricultural land nationally.

Western Australia had the highest application rate for irrigated agricultural land at 5.1 ML/ha followed by New South Wales (4.5 ML/ha) and Queensland (4.3 ML/ha). Tasmania had the lowest application rate at 2.5 ML/ha, followed by the Northern Territory (3.3 ML/ha).

1.2 IRRIGATION ACTIVITY, By State—2002–03 to 2005–06

	Agricultural establishments	Agricultural establishments irrigating	Area of agricultural holding	Area irrigated	Volume applied	Application rate
	no.	no.	'000 ha	'000 ha	ML	ML/ha
AUSTRALIA						
Old basis(a)						
2002–03	132 983	43 774	439 531	2 378	10 403 759	4.4
2003–04	130 526	40 400	440 110	2 402	10 441 515	4.3
2004–05	129 934	35 244	445 149	2 405	10 084 596	4.2
New basis(b)						
2005–06	155 052	45 130	444 077	2 583	10 844 708	4.2
2005–06						
New basis(b)						
NSW(c)	48 550	11 413	61 180	986	4 472 617	4.5
Vic.	36 993	11 658	13 364	657	2 470 542	3.8
Qld	32 871	10 220	155 571	572	2 435 215	4.3
SA	16 457	6 322	55 526	219	927 264	4.2
WA	14 816	3 249	99 096	62	317 703	5.1
Tas.	4 716	1 917	1 764	80	201 822	2.5
NT	648	352	57 574	6	19 546	3.3

(a) Derived using old ABS-maintained frame. See Technical Note for detail.

(b) Derived using new ABR-based register. See Technical Note for detail.

(c) Includes ACT.

At the Australian level, the major crop by volume of irrigation water applied remained pasture for grazing, using 2,871 gigalitres with an average application rate of 3.5 ML/ha. This was followed by cotton (1,746 gigalitres at an application rate of 6.3 ML/ha), rice (1,230 gigalitres at an application rate of 12.3 ML/ha) and sugar cane (1,104 gigalitres at an application rate of 5.0 ML/ha). Pasture for grazing accounted for 26.5% of all irrigation water use nationally, followed by cotton (16.1%), rice (11.3%) and sugar cane (10.2%).

IRRIGATION WATER USE

continued

In New South Wales, rice and cotton continued to be the major users of irrigation water accounting for 27.0% and 25.0% of the state total and 11.2% and 10.3% of the national total respectively.

In Queensland, sugar cane remained the major user of irrigation water, accounting for 42.7% of the Queensland total and 9.6% of the national total.

Pasture for grazing remained the major user of irrigation water in Victoria, using 63.4% of the Victorian total and 14.4% of the national total.

Irrigation of fruit trees, nut trees, plantation or berry fruits accounted for 64.8% of irrigation water in the Northern Territory.

WATER SOURCES

Across most of Australia, surface water remained the major source of water for agricultural purposes, totalling 9,074 gigalitres or 76.2% of all water used for agricultural purposes.

In South Australia and the Northern Territory, groundwater remained a more significant source of water, accounting for 47.3% of water used for agricultural purposes in South Australia and 69.5% in the Northern Territory. Across Australia, groundwater totalled 2,524 gigalitres or 21.2% of all water used for agricultural purposes.

Recycled or re-used water from off farm sources accounted for less than 1% of water used by agriculture.

CHAPTER 2

IRRIGATION WATER USE

2.1 PASTURES AND CROPS IRRIGATED, Australia—2002–03 to 2005–06

	<i>Agricultural establishments</i>	<i>Agricultural establishments irrigating</i>	<i>Area under pasture or crop</i>	<i>Area irrigated</i>	<i>Volume applied</i>	<i>Application rate</i>
	no.	no.	'000 ha	'000 ha	ML	ML/ha
.....						
TOTAL						
Old basis(a)						
2002–03	132 983	43 774	439 531	2 378	10 403 759	4.4
2003–04	130 526	40 400	440 110	2 402	10 441 515	4.3
2004–05	129 934	35 244	445 149	2 405	10 084 596	4.2
New basis(b)						
2005–06(c)	(d) 155 052	(d) 45 130	(e) 444 077	2 583	10 844 708	4.2
2005–06						
New basis(b)						
Pasture for grazing	117 989	14 248	389 225	811	2 871 388	3.5
Pasture for seed production	na	728	na	44	154 137	3.5
Pasture for hay and silage	na	6 399	na	211	777 330	3.7
Cereal crops cut for hay	na	1 334	na	62	149 953	2.4
Cereal crops for grain or seed(f)	38 629	2 113	19 648	291	697 468	2.4
Cereal crops not for grain or seed	11 865	1 078	946	28	60 518	2.2
Rice	1 035	1 035	100	100	1 230 379	12.3
Sugar cane	4 712	2 256	503	222	1 103 802	5.0
Cotton	846	725	336	277	1 746 386	6.3
Other broadacre crops(g)	16 650	901	3 022	56	162 707	2.9
Fruit trees, nut trees, plantation or berry fruits(h)	12 247	7 733	197	140	675 265	4.8
Vegetables for human consumption	6 732	6 072	135	121	450 567	3.7
Vegetables for seed	819	469	7	5	14 812	3.0
Nurseries, cutflowers or cultivated turf	3 990	3 673	19	17	91 645	5.4
Grapevines	9 358	8 337	199	180	625 655	3.5

na not available

(a) Derived using old ABS-maintained frame. See Technical Note for detail.

(b) Derived using new ABR-based register. See Technical Note for detail.

(c) Totals include other pastures or crops not elsewhere classified.

(d) Total does not equal the sum as many establishments grow or irrigate more than one crop or pasture.

(e) Total includes area of all agricultural land. This does not equal the sum of area under pasture or crop as not all land on agricultural holdings is under pasture or crop.

(f) Excludes rice.

(g) Excludes sugar cane and cotton.

(h) Excludes grapevines.

2.2 PASTURES AND CROPS IRRIGATED, New South Wales(a)—2002–03 to 2005–06 .

	<i>Agricultural establishments</i>	<i>Agricultural establishments irrigating</i>	<i>Area under pasture or crop</i>	<i>Area irrigated</i>	<i>Volume applied</i>	<i>Application rate</i>
	no.	no.	'000 ha	'000 ha	ML	ML/ha
TOTAL						
Old basis(b)						
2002–03	41 093	11 230	65 126	939	4 272 705	4.5
2003–04	40 915	9 998	63 631	892	3 953 125	4.4
2004–05	40 163	8 606	64 404	910	3 716 557	4.1
New basis(c)						
2005–06(d)	(e)48 550	(e)11 413	(f)61 180	986	4 472 617	4.5
2005–06						
New basis(c)						
Pasture for grazing	38 803	3 661	48 733	250	692 940	2.8
Pasture for seed production	na	137	na	7	^ 22 472	^ 3.1
Pasture for hay and silage	na	1 980	na	72	273 239	3.8
Cereal crops cut for hay	na	499	na	33	77 924	2.4
Cereal crops for grain or seed(g)	13 103	1 136	5 527	209	517 876	2.5
Cereal crops not for grain or seed	4 921	408	360	14	30 603	2.1
Rice	1 009	1 009	98	98	1 209 492	12.3
Sugar cane	528	26	34	^ 1	^ 2 512	^ 3.2
Cotton	400	366	200	171	1 120 188	6.5
Other broadacre crops(h)	3 540	347	484	31	98 609	3.2
Fruit trees, nut trees, plantation or berry fruits(i)	3 716	1 728	57	30	135 466	4.5
Vegetables for human consumption	1 586	1 398	19	18	74 584	4.0
Vegetables for seed	167	82	1	1	^ 3 018	^ 3.1
Nurseries, cutflowers or cultivated turf	1 301	1 229	5	5	27 935	5.7
Grapevines	1 884	1 675	46	41	176 848	4.3

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

na not available

(a) Includes ACT.

(b) Derived using old ABS-maintained frame. See Technical Note for detail.

(c) Derived using new ABR-based register. See Technical Note for detail.

(d) Totals include other pastures or crops not elsewhere classified.

(e) Total does not equal the sum as many establishments grow or irrigate more than one crop or pasture.

(f) Total includes area of all agricultural land. This does not equal the sum of area under pasture or crop as not all land on agricultural holdings is under pasture or crop.

(g) Excludes rice.

(h) Excludes sugar cane and cotton.

(i) Excludes grapevines.

2.3**PASTURES AND CROPS IRRIGATED, Victoria—2002–03 to 2005–06**

	<i>Agricultural establishments</i>	<i>Agricultural establishments irrigating</i>	<i>Area under pasture or crop</i>	<i>Area irrigated</i>	<i>Volume applied</i>	<i>Application rate</i>
	no.	no.	'000 ha	'000 ha	ML	ML/ha
TOTAL						
Old basis(a)						
2002–03	33 212	12 005	13 413	593	2 464 357	4.2
2003–04	32 463	10 844	13 619	619	2 559 385	4.1
2004–05	32 357	9 829	13 920	636	2 363 764	3.7
New basis(b)						
2005–06(c)	(d)36 993	(d)11 658	(e)13 364	657	2 470 542	3.8
2005–06						
New basis(b)						
Pasture for grazing	28 852	5 849	8 230	404	1 566 316	3.9
Pasture for seed production	na	141	na	12	27 402	2.3
Pasture for hay and silage	na	1 977	na	81	258 288	3.2
Cereal crops cut for hay	na	319	na	14	27 022	1.9
Cereal crops for grain or seed(f)	7 995	339	2 533	28	55 781	2.0
Cereal crops not for grain or seed	1 894	177	91	4	8 907	2.4
Rice	26	26	2	2	20 888	12.2
Sugar cane(g)	—	—	—	—	—	—
Cotton(g)	—	—	—	—	—	—
Other broadacre crops(h)	3 927	101	570	5	11 228	2.1
Fruit trees, nut trees, plantation or berry fruits(i)	1 877	1 352	39	33	191 810	5.7
Vegetables for human consumption	1 083	965	30	26	88 978	3.5
Vegetables for seed	230	165	2	2	4 714	2.3
Nurseries, cutflowers or cultivated turf	862	781	5	4	14 155	4.0
Grapevines	2 713	2 401	43	38	186 820	4.9

— nil or rounded to zero (including null cells)

na not available

(a) Derived using old ABS-maintained frame. See Technical Note for detail.

(b) Derived using new ABR-based register. See Technical Note for detail.

(c) Totals include other pastures or crops not elsewhere classified.

(d) Total does not equal the sum as many establishments grow or irrigate more than one crop or pasture.

(e) Total includes area of all agricultural land. This does not equal the sum of area under pasture or crop as not all land on agricultural holdings is under pasture or crop.

(f) Excludes rice.

(g) Data not collected.

(h) Excludes sugar cane and cotton.

(i) Excludes grapevines.

2.4

PASTURES AND CROPS IRRIGATED, Queensland—2002–03 to 2005–06

	<i>Agricultural establishments</i>	<i>Agricultural establishments irrigating</i>	<i>Area under pasture or crop</i>	<i>Area irrigated</i>	<i>Volume applied</i>	<i>Application rate</i>
	no.	no.	'000 ha	'000 ha	ML	ML/ha
TOTAL						
Old basis(a)						
2002–03	27 688	10 278	139 042	525	2 229 009	4.2
2003–04	26 785	9 520	144 288	561	2 420 048	4.3
2004–05	27 132	8 258	143 797	542	2 613 404	4.8
New basis(b)						
2005–06(c)	(d)32 871	(d)10 220	(e)155 571	572	2 435 215	4.3
2005–06						
New basis(b)						
Pasture for grazing	23 717	1 972	143 960	51	148 179	2.9
Pasture for seed production	na	93	na	2	^ 5 941	^ 2.4
Pasture for hay and silage	na	1 600	na	34	144 937	4.3
Cereal crops cut for hay	na	425	na	13	^ 37 842	^ 2.9
Cereal crops for grain or seed(f)	3 946	494	1 509	40	95 446	2.4
Cereal crops not for grain or seed	2 684	385	310	8	16 851	2.1
Rice(g)	—	—	—	—	—	—
Sugar cane	4 167	2 214	465	217	1 040 929	4.8
Cotton	446	358	136	105	626 198	5.9
Other broadacre crops(h)	1 353	207	115	10	26 137	2.7
Fruit trees, nut trees, plantation or berry fruits(i)	3 104	1 885	59	40	133 975	3.4
Vegetables for human consumption	1 913	1 704	44	40	107 562	2.7
Vegetables for seed	92	35	—	^ —	^ 400	^ 3.4
Nurseries, cutflowers or cultivated turf	952	897	5	5	26 407	5.7
Grapevines	236	212	3	3	^ 15 936	^ 4.8

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

— nil or rounded to zero (including null cells)

na not available

(a) Derived using old ABS-maintained frame. See Technical Note for detail.

(b) Derived using new ABR-based register. See Technical Note for detail.

(c) Totals include other pastures or crops not elsewhere classified.

(d) Total does not equal the sum as many establishments grow or irrigate more than one crop or pasture.

(e) Total includes area of all agricultural land. This does not equal the sum of area under pasture or crop as not all land on agricultural holdings is under pasture or crop.

(f) Excludes rice.

(g) Data not collected.

(h) Excludes sugar cane and cotton.

(i) Excludes grapevines.

2.5

PASTURES AND CROPS IRRIGATED, South Australia—2002–03 to 2005–06

	<i>Agricultural establishments</i>	<i>Agricultural establishments irrigating</i>	<i>Area under pasture or crop</i>	<i>Area irrigated</i>	<i>Volume applied</i>	<i>Application rate</i>
	no.	no.	'000 ha	'000 ha	ML	ML/ha
TOTAL						
Old basis(a)						
2002–03	14 262	5 471	54 139	183	899 530	4.9
2003–04	14 238	5 494	52 520	185	957 163	5.2
2004–05	14 111	4 739	54 107	184	877 818	4.8
New basis(b)						
2005–06(c)	(d) 16 457	(d) 6 322	(e) 55 526	219	927 264	4.2
2005–06						
New basis(b)						
Pasture for grazing	10 626	1 365	48 327	53	265 079	5.0
Pasture for seed production	na	255	na	20	94 077	4.8
Pasture for hay and silage	na	550	na	17	77 863	4.6
Cereal crops cut for hay	na	68	na	2	6 709	2.9
Cereal crops for grain or seed(f)	6 637	51	3 451	6	^ 8 385	^ 1.5
Cereal crops not for grain or seed	1 203	40	97	1	^ 1 637	^ 2.9
Rice(g)	—	—	—	—	—	—
Sugar cane(g)	—	—	—	—	—	—
Cotton(g)	—	—	—	—	—	—
Other broadacre crops(h)	3 454	54	536	2	6 816	3.5
Fruit trees, nut trees, plantation or berry fruits(i)	1 560	1 246	23	19	146 063	7.5
Vegetables for human consumption	664	623	16	14	83 075	5.8
Vegetables for seed	86	64	1	1	^ 3 151	^ 3.8
Nurseries, cutflowers or cultivated turf	284	264	1	1	5 859	5.1
Grapevines	3 295	3 052	89	83	225 875	2.7

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

— nil or rounded to zero (including null cells)

na not available

(a) Derived using old ABS-maintained frame. See Technical Note for detail.

(b) Derived using new ABR-based register. See Technical Note for detail.

(c) Totals include other pastures or crops not elsewhere classified.

(d) Total does not equal the sum as many establishments grow or irrigate more than one crop or pasture.

(e) Total includes area of all agricultural land. This does not equal the sum of area under pasture or crop as not all land on agricultural holdings is under pasture or crop.

(f) Excludes rice.

(g) Data not collected.

(h) Excludes sugar cane and cotton.

(i) Excludes grapevines.

2.6**PASTURES AND CROPS IRRIGATED, Western Australia—2002–03 to 2005–06 ...**

	<i>Agricultural establishments</i>	<i>Agricultural establishments irrigating</i>	<i>Area under pasture or crop</i>	<i>Area irrigated</i>	<i>Volume applied</i>	<i>Application rate</i>
	no.	no.	'000 ha	'000 ha	ML	ML/ha
TOTAL						
Old basis(a)						
2002–03	12 270	2 731	102 728	48	313 248	6.5
2003–04	11 877	2 459	101 184	54	308 254	5.7
2004–05	11 915	2 049	104 646	45	267 098	6.0
New basis(b)						
2005–06(c)	(d) 14 816	(d) 3 249	(e) 99 096	62	317 703	5.1
2005–06						
New basis(b)						
Pasture for grazing	11 645	550	84 733	13	84 384	6.3
Pasture for seed production	na	*np	na	*np	*np	*np
Pasture for hay and silage	na	np	na	2	^ 10 073	^ 4.1
Cereal crops cut for hay	na	^ 3	na	^ np	^ np	^ np
Cereal crops for grain or seed(f)	6 352	18	6 603	3	^ 13 018	^ 3.9
Cereal crops not for grain or seed	895	^ 11	80	*—	*867	*5.1
Rice(g)	—	—	—	—	—	—
Sugar cane	16	16	4	4	^ 60 361	^ 13.7
Cotton(g)	—	—	—	—	—	—
Other broadacre crops(h)	3 729	21	1 302	3	^ 9 002	^ 3.2
Fruit trees, nut trees, plantation or berry fruits(i)	1 344	1 021	12	9	50 133	5.4
Vegetables for human consumption	709	695	10	9	53 748	6.1
Vegetables for seed	79	^ 23	1	^ —	^ 1 112	^ 5.8
Nurseries, cutflowers or cultivated turf	426	367	2	2	14 973	7.1
Grapevines	1 045	856	16	13	17 409	1.4

^ 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

— nil or rounded to zero (including null cells)

na not available

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

(a) Derived using old ABS-maintained frame. See Technical Note for detail.

(b) Derived using new ABR-based register. See Technical Note for detail.

(c) Totals include other pastures or crops not elsewhere classified.

(d) Total does not equal the sum as many establishments grow or irrigate more than one crop or pasture.

(e) Total includes area of all agricultural land. This does not equal the sum of area under pasture or crop as not all land on agricultural holdings is under pasture or crop.

(f) Excludes rice.

(g) Data not collected.

(h) Excludes sugar cane and cotton.

(i) Excludes grapevines.

2.7**PASTURES AND CROPS IRRIGATED, Tasmania—2002–03 to 2005–06**

	<i>Agricultural establishments</i>	<i>Agricultural establishments irrigating</i>	<i>Area under pasture or crop</i>	<i>Area irrigated</i>	<i>Volume applied</i>	<i>Application rate</i>
	no.	no.	'000 ha	'000 ha	ML	ML/ha
TOTAL						
Old basis(a)						
2002–03	3 969	1 923	1 771	87	208 956	2.4
2003–04	3 866	1 939	1 745	87	229 355	2.6
2004–05	3 877	1 654	1 803	86	231 758	2.7
New basis(b)						
2005–06(c)	(d) 4 716	(d) 1 917	(e) 1 764	80	201 822	2.5
2005–06						
New basis(b)						
Pasture for grazing	4 054	839	1 233	41	114 440	2.8
Pasture for seed production	na	np	na	np	np	np
Pasture for hay and silage	na	220	na	5	10 685	2.3
Cereal crops cut for hay	na	np	na	^ np	^ np	^ np
Cereal crops for grain or seed(f)	587	75	23	4	6 962	1.6
Cereal crops not for grain or seed	264	55	7	1	1 653	1.2
Rice(g)	—	—	—	—	—	—
Sugar cane(g)	—	—	—	—	—	—
Cotton(g)	—	—	—	—	—	—
Other broadacre crops(h)	634	171	15	5	10 916	2.1
Fruit trees, nut trees, plantation or berry fruits(i)	341	256	4	3	5 146	1.7
Vegetables for human consumption	695	609	16	14	40 317	2.9
Vegetables for seed	164	100	1	1	2 417	3.3
Nurseries, cutflowers or cultivated turf	125	96	—	np	^ np	^ np
Grapevines	174	134	2	1	1 194	1.1

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

— nil or rounded to zero (including null cells)

na not available

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

(a) Derived using old ABS-maintained frame. See Technical Note for detail.

(b) Derived using new ABR-based register. See Technical Note for detail.

(c) Totals include other pastures or crops not elsewhere classified.

(d) Total does not equal the sum as many establishments grow or irrigate more than one crop or pasture.

(e) Total includes area of all agricultural land. This does not equal the sum of area under pasture or crop as not all land on agricultural holdings is under pasture or crop.

(f) Excludes rice.

(g) Data not collected.

(h) Excludes sugar cane and cotton.

(i) Excludes grapevines.

2.8

PASTURES AND CROPS IRRIGATED, Northern Territory—2002–03 to 2005–06 ...

	<i>Agricultural establishments</i>	<i>Agricultural establishments irrigating</i>	<i>Area under pasture or crop</i>	<i>Area irrigated</i>	<i>Volume applied</i>	<i>Application rate</i>
	no.	no.	'000 ha	'000 ha	ML	ML/ha
TOTAL						
Old basis(a)						
2002–03	397	136	63 263	3	15 953	4.7
2003–04	382	145	63 124	4	14 186	3.7
2004–05	380	110	62 473	4	14 198	4.0
New basis(b)						
2005–06(c)	(d)648	(d)352	(e)57 574	6	19 546	3.3
2005–06						
New basis(b)						
Pasture for grazing	292	^ 11	54 009	*—	^ 49	1.1
Pasture for seed production	—	—	—	—	—	—
Pasture for hay and silage	—	*np	—	*—	*2 246	10.3
Cereal crops cut for hay	—	*np	—	*np	*np	np
Cereal crops for grain or seed(f)	^ 8	—	^ 1	—	—	—
Cereal crops not for grain or seed	*4	—	*—	—	—	—
Rice(g)	—	—	—	—	—	—
Sugar cane(g)	—	—	—	—	—	—
Cotton(g)	—	—	—	—	—	—
Other broadacre crops(h)	^ 12	—	^—	—	—	—
Fruit trees, nut trees, plantation or berry fruits(i)	304	245	5	4	12 673	3.0
Vegetables for human consumption	82	78	1	1	2 304	3.7
Vegetables for seed	1	—	—	—	—	—
Nurseries, cutflowers or cultivated turf	40	39	—	np	^ np	^ np
Grapevines	^ 11	^ 8	—	—	1 573	5.4

^ 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

— nil or rounded to zero (including null cells)

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

(a) Derived using old ABS-maintained frame. See Technical Note for detail.

(b) Derived using new ABR-based register. See Technical Note for detail.

(c) Totals include other pastures or crops not elsewhere classified.

(d) Total does not equal the sum as many establishments grow or irrigate more than one crop or pasture.

(e) Total includes area of all agricultural land. This does not equal the sum of area under pasture or crop as not all land on agricultural holdings is under pasture or crop.

(f) Excludes rice.

(g) Data not collected.

(h) Excludes sugar cane and cotton.

(i) Excludes grapevines.

CHAPTER 3

WATER SOURCES

3.1 SOURCES OF AGRICULTURAL WATER(a), By State—2005–06

	Surface water	Groundwater	Town or country reticulated mains supply	Recycled or re-used water from off farm sources	Other	Total all sources
	ML	ML	ML	ML	ML	ML
NSW(b)	3 855 673	837 106	30 268	22 490	11 247	4 756 784
Vic.	2 281 162	318 738	34 411	37 770	16 334	2 688 415
Qld	1 938 703	721 298	9 692	34 287	10 888	2 714 868
SA	464 856	483 053	51 206	11 002	10 488	1 020 606
WA	317 838	124 393	17 122	^ 717	^ 2 493	462 563
Tas.	205 506	16 266	np	^ np	np	228 465
NT	9 835	23 058	^ np	*np	*np	33 167
Aust.	9 073 574	2 523 912	147 050	107 569	52 763	11 904 869

^ 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 water used for irrigation and other agricultural purposes.

(b) Includes ACT.

EXPLANATORY NOTES

INTRODUCTION

1 This publication presents preliminary estimates from the 2005–06 Agricultural Census. It contains detailed statistics at the national and state/territory level on agricultural water use, pastures and crops irrigated, and sources of water used for agriculture.

2 The ABR-based register has been used for the first time to conduct the 2005–06 Agricultural Census. The key implication of this strategy is that census data will not be directly comparable with historical time series. This is because, in addition to the change in register, there have been changes in methodologies used for determining whether agricultural businesses are 'in-scope' of the collection, and in some of the ways the data are compiled. These changes include improved estimation and imputation techniques. Implications of these changes are discussed in the Technical Note at the end of this publication. For these reasons, care should be taken in comparing the results from 2005–06 with those of earlier years.

3 Historical time series estimates presented here for 2002–03 were derived from the Water Survey - Agriculture 2002–03, while estimates for 2003–04 and 2004–05 were derived from the Agricultural Surveys. Due to differences in collection methodologies between these surveys, care should also be taken in comparing the 2002–03 results with those of later years.

NEW FRAME

4 The ABR-based register (Inteframe) used by the Agricultural Census contains approximately 155,000 business units flagged as having both agricultural activity and an estimated value of agricultural operations of \$5,000 plus or a Standardised BAS Total Sales (SBTS) of \$5,000 plus. SBTS is an 'EVAO equivalent' and is calculated by applying ANZSIC based standardisation factors to BAS Total sales for ATOMP units.

5 ABNs identified through ABS frame maintenance activities as not operating an agricultural property are excluded from scope. The number identified on the ABR-based register (approximately 155,000) excludes known duplicate/multiple ABNs from related entity units (a related entity unit is a group of ABNs which could all report the same activity on the same parcels of land leading to duplication of reporting) and also ABNs identified through ABS frame maintenance activities as not operating an agricultural property.

SCOPE AND COVERAGE

6 The scope of the 2005–06 Agricultural Census was establishments undertaking agricultural activity with an estimated value of agricultural operations (EVAO) of \$5,000 or more, or a Standardised BAS Total Sales (SBTS) of \$5,000 plus. While the new ABR-based register used for the Agricultural Census does not contain all agricultural businesses in Australia, it provides better coverage than the old ABS-maintained Agricultural Survey frame since 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 used for the Agricultural Census 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.

7 The 2005–06 Agricultural Census included a total in-scope population of approximately 155,000 agricultural businesses compared to approximately 130,000 establishments on the old ABS-maintained frame.

OTHER WATER USE	8 Due to a low response to the question on water use for agricultural purposes other than irrigation, a high level of imputation was required to produce estimates for this item. Industry information and feedback from respondents on stock drinking rates was used, where possible, to impute. Estimates of water used for agricultural purposes other than irrigation should be used with caution.
APPLICATION RATE	9 The Australian and state/territory totals for application rate of water applied for irrigation are calculated by dividing total area irrigated by total volume applied averaged across all pastures and crops.
COMPARABILITY WITH WATER ACCOUNT AUSTRALIA	10 The ABS published data on water use by the agriculture sector in both <i>Water Use on Australian Farms, 2004–05</i> in July 2006, and <i>Water Account, Australia 2004–2005</i> in November 2006. While both contained estimates of Agricultural water use, small differences exist between the two due to different data sources and compilation methodologies. The Water Account used data from a number of sources to calculate the volume of water used by the agriculture industry. These included data on water use, irrigated area and livestock numbers from the ABS 2004–05 Agricultural Survey, information collected from irrigation authorities, and additional information available from State and Territory agricultural departments and research institutions. <i>Water Use on Australian Farms, 2004–05</i> presented more spatial and crop detail on water use in the context of irrigation management and practices reported by the agricultural industry that was obtained entirely from the 2004–05 Agricultural Survey.
RESPONSE RATE	11 The response rate for the Agricultural Census 2005–06 was 93.0%.
RELIABILITY OF DATA	12 The estimates in this publication are subject to sampling and non-sampling errors.
SAMPLING ERRORS	<p>13 The estimates in this publication are based on information obtained from respondents to the Agricultural Census for the year ended 30 June 2006. Since not all selected units responded, the estimates may differ from those that would have been produced if all farms had responded. 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.</p> <p>14 In this publication, 'sampling' variability of the estimates is measured by the relative standard error (RSE) which is obtained by expressing the SE as a percentage of the estimates to which it refers.</p> <p>15 Most published estimates have RSEs less than 5%. For some states/territories with limited irrigation of certain commodities or limited numbers of units reporting a particular source of agricultural water, RSEs are greater than 10%. 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.</p> <p>16 The following table contains estimates of RSEs for a selection of the statistics presented in this publication.</p>

RELATIVE STANDARD ERRORS OF SELECTED ESTIMATES, By State—2005–06

	Aust.	NSW(a)	Vic.	Qld	SA	WA	Tas.	NT
	%	%	%	%	%	%	%	%
Total area irrigated (ha)	0.4	0.8	0.5	0.8	2.2	1.8	1.1	3.6
Total volume applied (ML)	0.5	0.9	0.5	1.1	1.3	3.2	1.3	5.6
Pasture for grazing - area irrigated (ha)	0.5	1.0	0.5	2.0	1.4	3.1	1.5	25.9
Pasture for grazing - volume applied (ML)	0.4	1.1	0.5	2.1	1.7	3.4	1.8	24.1
Rice - area irrigated (ha)	1.4	1.4	4.5	na	na	na	na	na
Rice - volume applied (ML)	1.4	1.4	4.5	na	na	na	na	na
Sugar cane - area irrigated (ha)	1.2	11.1	na	1.2	na	8.1	na	na
Sugar cane - volume applied (ML)	1.7	10.7	na	1.6	na	10.9	na	na
Cotton - area irrigated (ha)	1.5	2.1	na	2.1	na	na	na	na
Cotton - volume applied (ML)	1.7	2.3	na	2.4	na	na	na	na
Sources of agricultural water - surface water (ML)	0.5	0.9	0.5	1.1	1.6	3.0	1.3	3.0
Sources of agricultural water - groundwater (ML)	0.8	1.6	1.5	1.5	1.7	2.7	3.4	5.2

na not available

(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.

ABS DATA AVAILABLE ON REQUEST

18 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.

RELATED PUBLICATIONS

19 A range of environmental and agricultural publications is produced by the ABS, including:

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

Environmental Issues: People's Views and Practices (cat. no. 4602.0)

Natural Resource Management on Australian Farms (cat. no. 4620.0)

Selected Agricultural Commodities, Australia, Preliminary (cat. no. 7112.0)

Water Access Entitlements, Allocations and Trading (cat. no. 4610.0.55.003)

Water Account, Australia (cat. no. 4610.0)

21 Current publications and other products released by the ABS are listed in the *Catalogue of Publications and Products (cat. no. 1101.0)*. The Catalogue is available from any ABS office or 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.

ACKNOWLEDGMENT

22 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. The Bureau of Meteorology's contribution of the Climate Conditions Appendix in this publication is especially acknowledged.

ABBREVIATIONS

'000	thousand
ACT	Australian Capital Territory
Aust.	Australia
EVAO	Estimated Value of Agricultural Operations
ha	hectare
mm	millimetre
ML	megalitre
ML/ha	megalitres per hectare
no.	number
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
°C	degrees Celsius

AUSTRALIAN CLIMATE IN
2005-06

Over Australia as a whole, 2005-06 was a relatively wet period. The all-Australian rainfall was 20% above normal, making it the 11th wettest (financial) year since 1900-01. The largest contributor to this high rainfall total was a very active tropical wet season, which saw well above normal rainfall in most of the northern tropics, as well as much of the interior of Western Australia. Tropical cyclones (or their remnants) played a major role, particularly in Western Australia. It was the 6th wettest year on record for northern Australia (north of 26°S), as well as for the Northern Territory and Western Australia, and a number of regions (notably in the Pilbara, the Gulf country around the Queensland/NT border, and the Nullarbor around Eucla) had their wettest year on record.

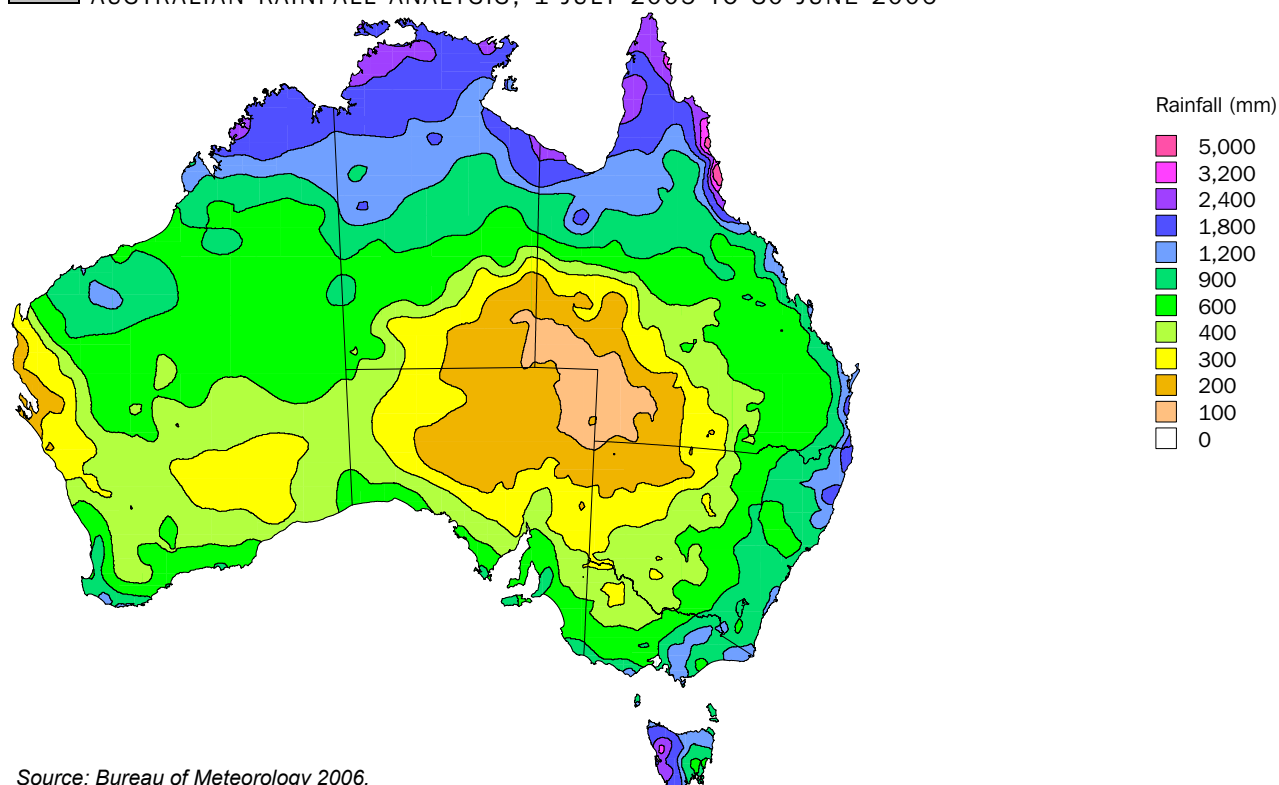
In most of eastern Australia outside the tropics, the winter and spring of 2005 were wet, with dry conditions then becoming established from December 2005 onwards. Averaged over eastern agricultural areas as a whole the year saw near-normal rainfall, but with some regional variations. In most South Australian cropping areas, as well as in parts of Tasmania, the winter-spring of 2005 was particularly wet and annual totals remained somewhat above average; conversely, in western Victoria and southern Queensland, the rain early in the period was not sufficient to make up for the dry finish. Most other eastern cropping areas had near-normal rainfall for the year.

In the south-west of Western Australia, winter and spring 2005 saw generally near-normal rainfall, whilst the remnants of Tropical Cyclone Clare brought very heavy rain to the eastern wheatbelt in January. It was very dry thereafter throughout the agricultural areas, with April-June widely the driest on record. Over the full 12-month period, rainfall ranged from above normal in eastern wheatbelt areas favoured by Clare, to well below normal along the coast, with record low totals in the Perth-Bunbury area.

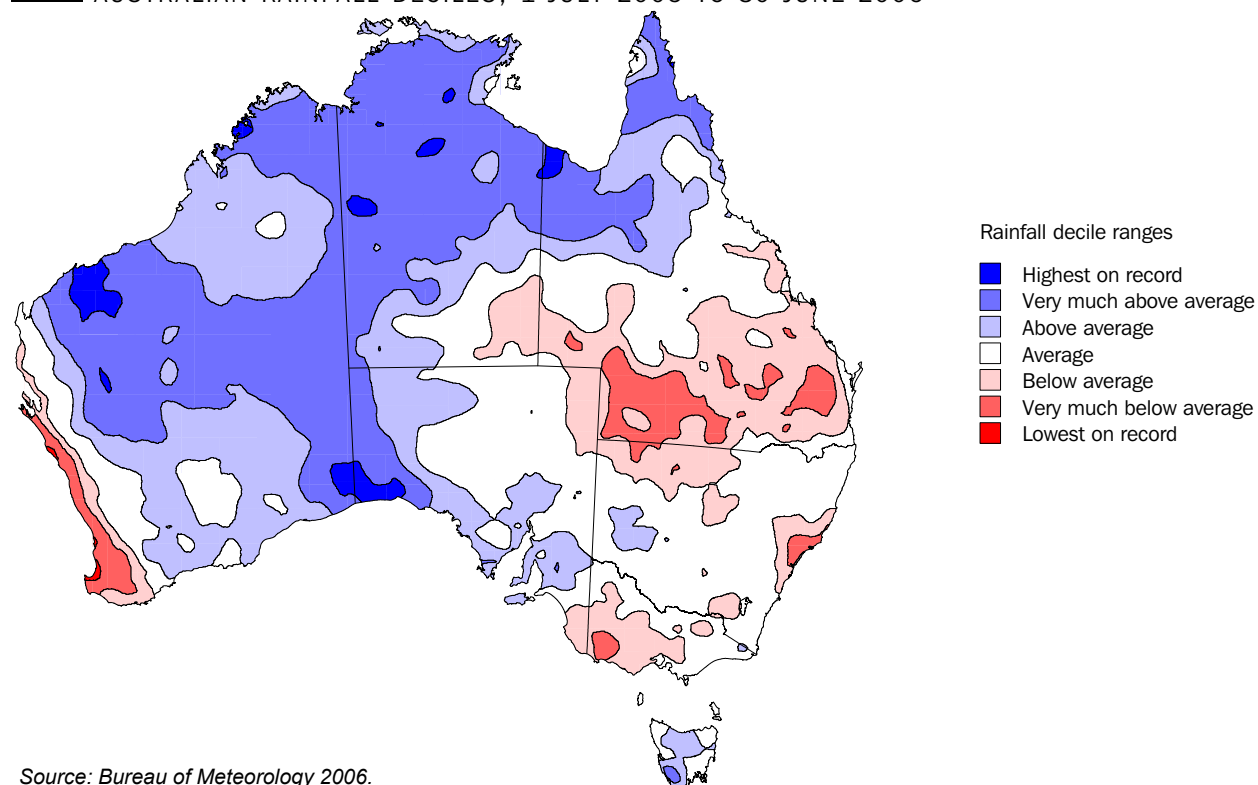
Temperatures were slightly above normal over the period, with maximum temperatures 0.28°C above normal (18th highest on record) and minimum temperatures 0.36°C above normal. 2005 and early 2006 were warm, the culmination of Australia's warmest calendar year on record in 2005. However, it turned cooler in early 2006. The active tropical wet season saw below-normal temperatures in most of northern and western Australia in the early months of 2006, and below-normal temperatures then extended to most of the continent from April onwards.

It was a very hot summer (the hottest on record in many places) over much of inland eastern Australia, particularly inland New South Wales and southern Queensland. Conversely, there were widespread severe frosts through both southeast and southwest Australia in May and June. Mid-June was particularly cold with a number of locations in south-western Western Australia, South Australia and northern Victoria breaking or approaching all-time records.

Over the year as a whole, the strongest warm anomalies occurred in southern inland Queensland, with maximum temperatures generally 1.5-2.5°C above normal. Conversely, southern Western Australia was rather cool, particularly at night, with minima 1-2°C below normal and maxima around 0.5°C below normal.

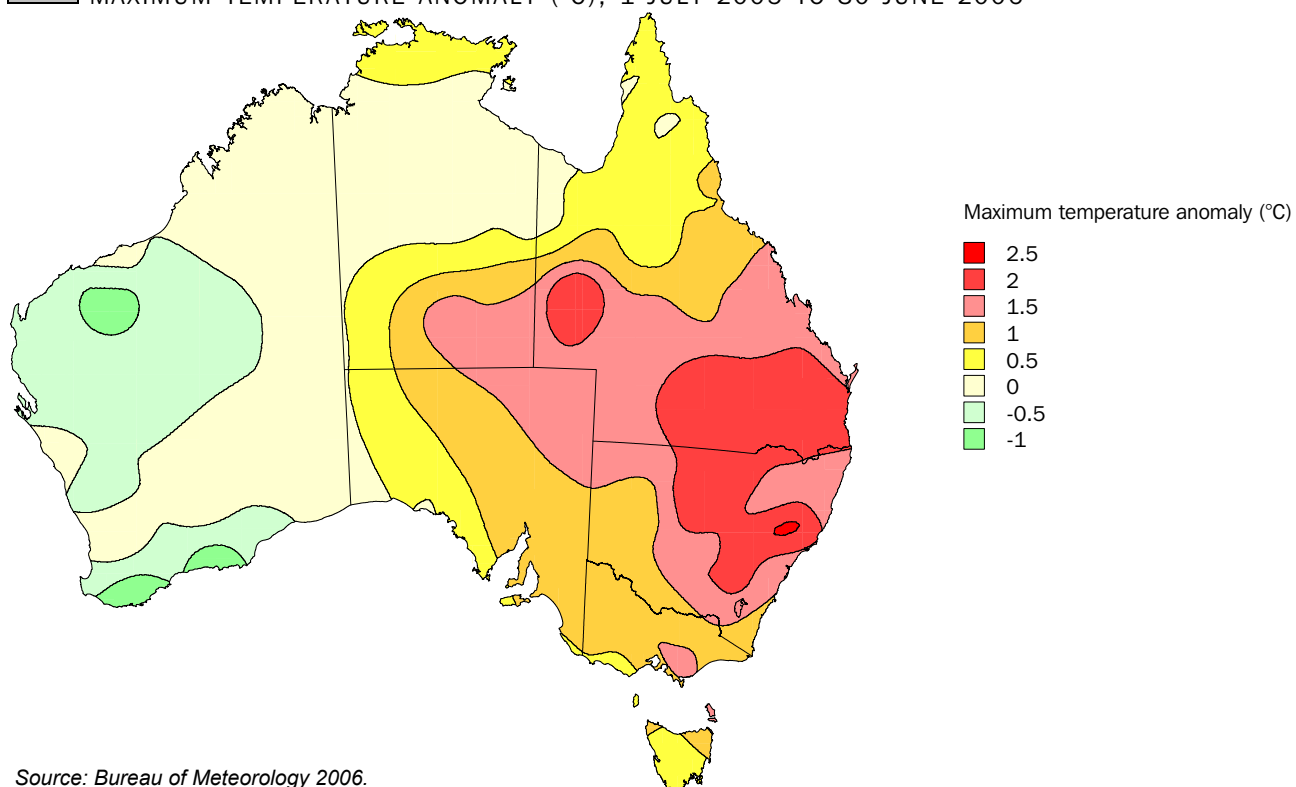
A1.1 AUSTRALIAN RAINFALL ANALYSIS, 1 JULY 2005 TO 30 JUNE 2006

Source: Bureau of Meteorology 2006.

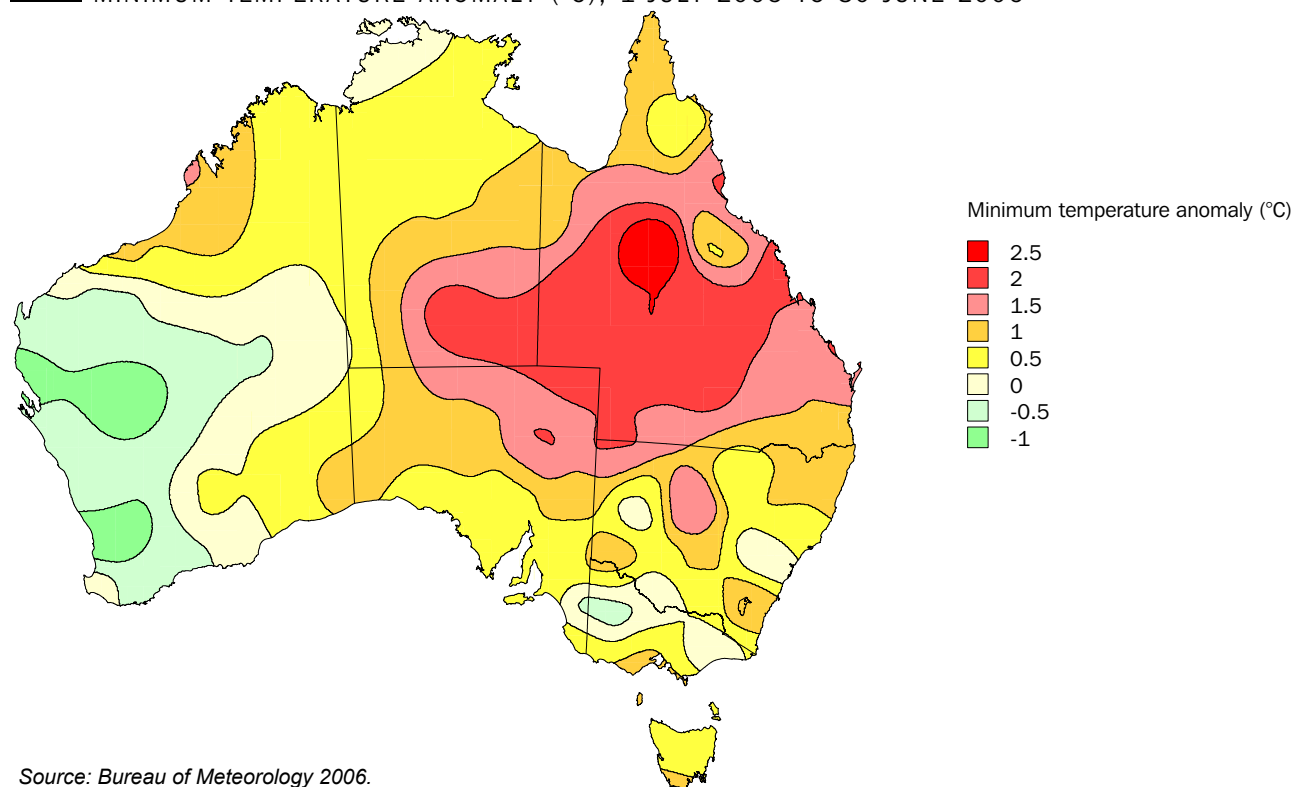
A1.2 AUSTRALIAN RAINFALL DECILES, 1 JULY 2005 TO 30 JUNE 2006

Source: Bureau of Meteorology 2006.

A1.3 MAXIMUM TEMPERATURE ANOMALY (°C), 1 JULY 2005 TO 30 JUNE 2006



A1.4 MINIMUM TEMPERATURE ANOMALY (°C), 1 JULY 2005 TO 30 JUNE 2006



OLD BASIS ESTIMATES

- 1** Prior to running the 2005–06 Agricultural Census, the ABS had maintained its own register of agricultural establishments. However, it was increasingly difficult to maintain this list, and users were questioning the accuracy of some data.
- 2** The ABS investigated a number of alternatives for maintaining an agricultural business register and discussed these with key users of agriculture statistics. As a result of this, it was agreed that the ABS should move to a new frame sourced from the Australian Taxation Office's Australian Business Register (ABR) for the 2005–06 Agricultural Census.
- 3** The ABR-based register consists of all businesses on the ABR coded to an 'agricultural' industry, as well as businesses which have indicated they undertake agricultural activities. All businesses with a turnover of \$50,000 or more are required to register on the ABR. Many agricultural businesses with a turnover of less than \$50,000 have also chosen to register on the ABR.
- 4** Moving to the ABR-based register required changes to many of the methodologies used for compiling agriculture commodity and water statistics. These included changes to the methods used for determining whether agricultural businesses were 'in-scope' of the collection, and also to ways the data were compiled (please see paragraphs 6–7 of the Explanatory Notes for more information about the changes in scope and coverage).

IMPLICATIONS FOR USERS

- 5** The key implication of the move to the new register is that the Census data will not be directly comparable with the historical time series of agricultural water data. To provide users with a way of comparing ('bridging') water data from the 2005–06 Agricultural Census with the historical time series, the ABS has prepared two sets of estimates (see paragraph 12).
- 6** 'New-basis' estimates have been prepared for 2005–06 using the new ABR-based register and its associated statistical methodologies. These methodologies have been subjected to rigorous analysis and testing, with the resulting 'new basis' water estimates representing the start of the new series.
- 7** 'Old-basis' estimates have also been prepared for 2005–06. These estimates are a best judgement approximation to what the 2005–06 water estimates may have been if the ABS had continued to use the previous ABS-maintained list of establishments (with its associated statistical methodologies) to conduct the 2005–06 Agricultural Census.

BRIDGING METHODOLOGY

- 8** The need for a bridging strategy for the Agriculture Census was outlined in Information Paper: *Agriculture Census: ABS Views on Content & Procedures, 2005–06* (cat. no. 7103.0) and was discussed extensively with key users in March 2006.
- 9** Key considerations of the bridging strategy have included:
 - a) known movements between 2004–05 and 2005–06 for those units common to both the old and new frame;
 - b) the contribution to 'old-basis' estimates of those units common to both the old and new frame; and
 - c) the contribution to 'old-basis' estimates of uncommon units (i.e. those old frame units which were out-of-scope of the new business register or old frame units which the ABS was not able to link to corresponding units on the new frame).

INTERPRETING THE BRIDGED
DATA

10 Users should recognise the preliminary nature of both sets of 2005–06 water estimates. They should also exercise a degree of caution in interpreting the tables as both the 'old-basis' and the 'new-basis' estimates are subject to sampling and non-sampling variability.

11 The non-sampling variability in the 'old-basis' 2005–06 estimates in particular, is expected to be significant due to difficulties in collecting, processing and estimating 'old basis' data from a 'new basis' framework. For this reason, the 2005–06 'old-basis' estimates should be used with considerable caution and movements between 2004–05 and 2005–06 considered as indicative only. For more information, see the Technical Note in *Selected Agricultural Commodities, Australia, Preliminary 2005–06 (cat. no. 7112.0)*.

12 The following tables allow users to compare 2004–2005 and 2005–2006 'old-basis' and 'new-basis' estimates subject to the caveats mentioned.

KEY PASTURES AND CROPS IRRIGATED, Australia—Old basis and New
basis estimates

	OLD BASIS(a)		NEW BASIS(b)
	2004-05	2005-06	2005-06
Agricultural water use			
Irrigation (ML)	10 084 596	10 381 934	10 844 708
Other agricultural uses (ML)	1 061 906	977 150	1 060 161
Total water use (ML)	11 146 502	11 359 083	11 904 869
Key pastures and crops irrigated			
Pasture for grazing (ML)	2 896 543	2 734 564	2 871 388
Rice (ML)	618 964	1 161 893	1 230 379
Sugar cane (ML)	1 171 933	1 168 569	1 103 802
Cotton (ML)	1 819 316	1 874 497	1 746 386
Fruit trees, nut trees, plantation or berry fruits (ML)(c)	608 138	547 688	675 265
Vegetables for human consumption (ML)	419 249	373 954	450 567

(a) Derived using old ABS-maintained frame. See Technical Note for detail.

(b) Derived using new ABR-based register. See Technical Note for detail.

(c) Excludes grapevines.

AGRICULTURAL WATER USE, By State—Old basis and New basis estimates

	<i>Aust.</i>	<i>NSW(a)</i>	<i>Vic.</i>	<i>Qld</i>	<i>SA</i>	<i>WA</i>	<i>Tas.</i>	<i>NT</i>
WATER USE								
Irrigation (ML)								
Old basis(b)								
2004–05	10 084 596	3 716 557	2 363 764	2 613 404	877 818	267 098	231 758	14 198
2005–06	10 381 934	4 277 208	2 318 185	2 437 670	880 627	278 357	178 210	11 678
New basis(c)								
2005–06	10 844 708	4 472 617	2 470 542	2 435 215	927 264	317 703	201 822	19 546
Other agricultural uses (ML)								
Old basis(b)								
2004–05	1 061 906	259 551	206 456	251 486	^ 127 010	162 274	23 690	31 440
2005–06	977 150	244 058	199 305	268 750	97 457	129 567	25 275	12 737
New basis(c)								
2005–06	1 060 161	284 166	217 874	279 654	93 342	144 860	26 643	13 621
Total (ML)								
Old basis(b)								
2004–05	11 146 502	3 976 108	2 570 219	2 864 889	1 004 828	429 372	255 448	45 638
2005–06	11 359 083	4 521 265	2 517 490	2 706 420	978 085	407 924	203 485	24 414
New basis(c)								
2005–06	11 904 869	4 756 784	2 688 415	2 714 868	1 020 606	462 563	228 465	33 167

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

(a) Includes ACT.

(b) Derived using old ABS-maintained frame. See Technical Note for detail.

(c) Derived using new ABR-based register. See Technical Note for detail.

GLOSSARY

Agricultural establishment	An establishment which is engaged mainly in agricultural activities.
Application rate	Rate at which water is applied to an area or crop, measured in megalitres per hectare.
Area of holding	Includes all occupied and maintained land owned, leased or rented, land worked by sharefarmers and all road permits by a particular agricultural establishment. Excludes land leased or rented to others.
Estimated value of agricultural operations (EVAO)	An estimation of the value of agricultural activity undertaken by an agricultural establishment. Three-year average weighted prices are applied to livestock turnoff and livestock numbers on the farm, and to area and production data for crops. The resultant aggregation of these commodity values is the EVAO. It is not an indicator of the value of receipts of individual farms but rather an indicator of the extent of agricultural activity.
Gigalitre	One thousand million litres.
Groundwater	Water occurring below the ground's surface.
Megalitre	One million litres.
Recycled or re-used water (off-farm)	Waste water, that may have been treated to some extent, that is used again without first being discharged to the environment e.g. sewage water brought onto a property for the purpose of irrigation.
Surface water	Water flowing or held in streams, rivers and other wetlands in the landscape.
Town or country reticulated mains supply	Water supplied, often through a non-natural network, where an economic transaction has occurred for the exchange of this water.

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