australian sugar cane growers
financial performance 2005-06

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foreword

The Australian sugar cane industry is facing the challenge of enhancing producers' profitability during a period of increasing competition in export markets and declining returns. Industry stakeholders, government decision makers and growers need to become better informed about the key factors likely to affect costs of production and financial performance. This information is critical in assessing the risks and challenges facing sugar cane growers and is particularly important for the future development of strategies and R&D programs to improve the long run viability of sugar cane production.

This study profiles sugar cane growers in Australia and was conducted on behalf of the Sugar Industry Oversight Group (IOG), in collaboration with CANEGROWERS and funded by the Australian Government Department of Agriculture, Fisheries and Forestry. The objective of this study was to identify the distinguishing characteristics, in terms of production and financial performance, of farms of varying sizes and the management practices used by farmers that are likely to be critical for the long term viability of these producers.

This report contains a snapshot of farm performance for the 2005-06 financial year based on comprehensive production and financial performance data collected from sugar cane growers in Australia. ABARE and the Sugar IOG are confident that the information in this report will provide an insight into the production and management issues faced by Australian sugar cane growers.

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October 2007

acknowledgments

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summary

- Increased competition from major sugar exporting countries such as Brazil has put pressure on prices in Australia's export markets, and subsequently on returns for Australian sugar cane growers. In order for the Australian sugar cane industry to remain viable and competitive, producers, millers and the whole sugar value chain need to continue improving productivity.
- The Australian sugar cane growing industry is in transition, with the volume of production relatively stable but with a reduced number of producers, suggesting a trend toward a smaller number of larger farms. A key reason for this transition appears to be some economies of size.
- In 2005-06, there were 4824 sugar cane growers in Australia, who produced, on average, 8250 tonnes of sugar cane per farm. However, there was a wide dispersion of farm sizes and sugar cane production around this average. Nearly two-thirds of growers produced less than 7500 tonnes of sugar cane and accounted for around a quarter of Australia's sugar cane production in 2005-06. In comparison, an estimated 3 per cent of growers produced more than 30 000 tonnes and accounted for around 22 per cent of national sugar cane production.
- Farm cash income for sugar cane growers averaged $66 600 in 2005-06; however, an estimated 27 per cent of producers reported negative farm cash incomes. Most of the farms reporting negative farm cash incomes were smaller sugar cane growers producing less than 7500 tonnes. Regions with below average incomes included southern Queensland, New South Wales, Bundaberg and far north Queensland. These regions had a relatively high concentration of small scale sugar cane growers.
- The survey results indicate that financial performance improved as the scale of sugar cane production increased in every region. For example, in the Burdekin, farms producing less than 15 000 tonnes of sugar cane reported a loss of $40 200, compared with a profit of $22 400 for farms producing 15 000 – 30 000 tonnes of sugar cane and $357 600 for farms producing more than 30 000 tonnes.
- The survey results suggest that there may be some economies of size (whereby average unit cash costs of production decline as firms expand production)

in the Australian sugar cane growing industry. The average unit cash cost of production for the smallest sugar cane growers, by quantity of sugar cane produced, is estimated to have been around $21 a tonne in 2005-06. For the largest sugar cane growers, the average unit cash cost of production in 2005-06 is estimated to have been around $18 a tonne.

- In 2005-06, the average gross margin of sugar cane production is estimated to have been around $8 a tonne. Sugar cane production was most profitable for growers in the Ord River and Herbert regions, and least profitable for growers in New South Wales and far north Queensland.
- Around half of all producers indicated that they expect to maintain or increase sugar cane production over the next three years, compared with 16 per cent of producers who expected to reduce the area sown to sugar.
- The survey results show that sugar cane producers have actively sought information to better manage their farms. The most common sources of information on farm management and production used by sugar cane growers were family, friends and other growers. Nearly 80 per cent of sugar cane growers obtained information from industry organisations such as the cane growers associations and over 60 per cent sourced information from the media.
- In 2005-06, an estimated 33 per cent of sugar cane growers had a written farm management plan, with nearly all producers' plans containing information on production activities, natural resource management, and business activities. However, of the farms with management plans, only 47 per cent contained information on people management and succession planning. The survey results indicate that the proportion of farm plans including people management and succession planning increased significantly with the volume of sugar cane production, reflecting the greater reliance of larger producers on hired labour.

1

introduction

In March 2007, ABARE conducted a survey of sugar cane growers on behalf of the Sugar Industry Oversight Group (IOG) and in collaboration with CANEGROWERS. The survey was funded by the Australian Government Department of Agriculture, Fisheries and Forestry. The aim of the survey was to collect comprehensive production and financial data for 2005-06 from 291 farms to analyse the financial performance of sugar cane growers in Australia.

This report presents detailed physical and financial performance indicators for sugar cane growers by region. A more detailed set of regional estimates is provided in a separate document presented with this report. Results from the survey are designed to provide information about the key factors likely to affect farm costs of production and financial performance.

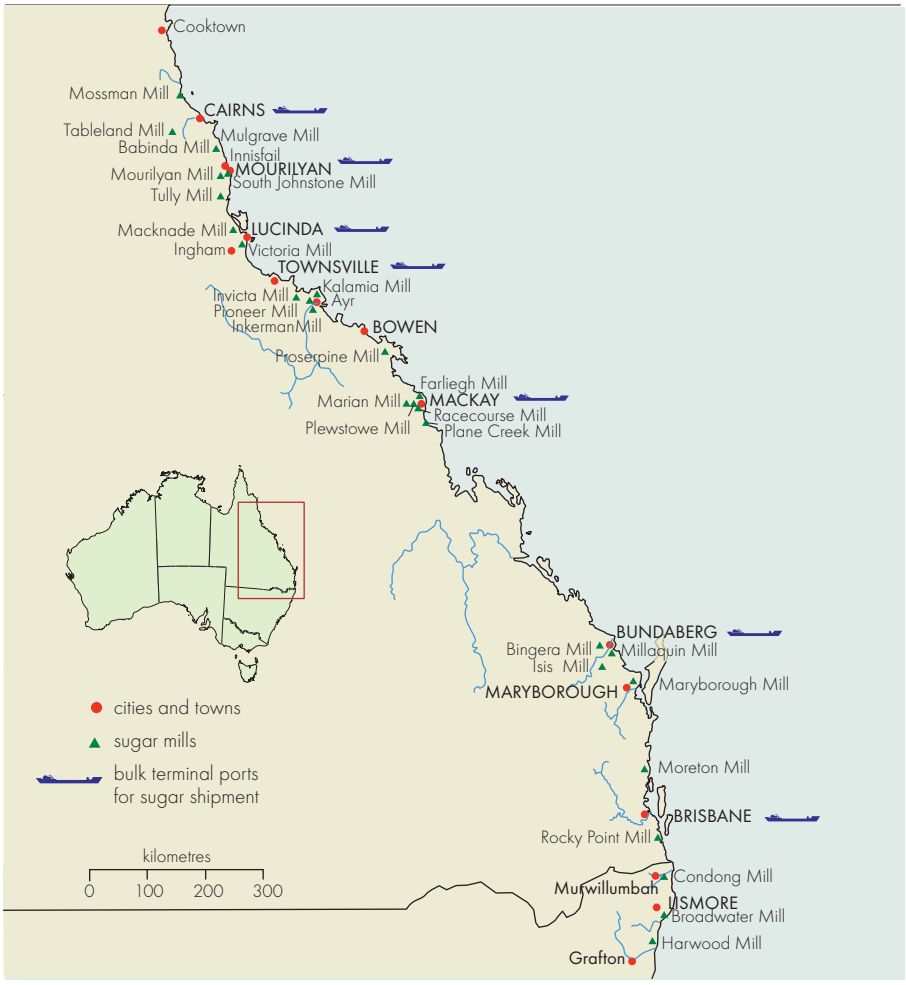
The Australian sugar cane industry is located mainly along Australia's eastern coastline, from Mossman in far north Queensland to Grafton in northern New South Wales (map 1). A small quantity of sugar cane is also grown in the Ord River region of Western Australia. In 2005-06, around 39 million tonnes of sugar cane was produced in Australia, of which the majority was processed into sugar. Around 80 per cent of sugar production was exported. Significant changes in the industry over recent years have resulted in a decline in the number of sugar cane growers and contractions in both the area sown and the production of sugar cane in Australia (figure A).

fig A **area and production of sugar cane**
Australia

Increased competition from major exporting countries such as Brazil has put downward pressure on prices in Australia's export markets, and subsequently on returns to Australian sugar cane growers. For the Australian sugar cane industry to

remain viable and competitive, producers, millers and the whole sugar value chain need to continue to improve productivity. At the same time, there is a need for the industry to have a good understanding of the financial performance of sugar cane growers and the key drivers of farm profitability and productivity.

map 1 **Queensland and New South Wales sugar mills**



2

physical characteristics of sugar cane farms

In 2005-06, there were 4824 sugar cane growers in Australia, who produced, on average, 8250 tonnes of sugar cane per farm. However, farm sizes and production of cane varied widely around this average (table 1). Nearly two-thirds of growers produced less than 7500 tonnes of sugar cane and accounted for around a quarter of Australia's sugar cane production in 2005-06. In comparison, an estimated 3 per cent of growers produced more than 30 000 tonnes and accounted for around 22 per cent of national sugar cane production.

In 2005-06, the average area operated by Australian sugar cane growers was 184 hectares, although half of all sugar cane farms operated less than 106

table 1 **distribution of farms, by quantity of cane produced, 2005-06**
Australian sugar cane industry

	sugar cane growers	share of growers	share of production
	no.	%	%
quantity of sugar cane produced			
less than 7500 tonnes	3 130	65	25
7500 to 15 000 tonnes	1 035	22	27
15 000 to 22 500 tonnes	349	7	16
22 500 to 30 000 tonnes	156	3	10
30 000 to 50 000 tonnes	105	2	10
more than 50 000 tonnes	49	1	12
total	4 824	100	100

table 2 **distribution of farms, by selected estimates, by quartile, 2005-06**
Australian sugar cane industry

		value below which specified percentage of farms lie			
		25%	50%	75%	average
area operated	ha	55	106	200	184
area sugar cane harvested	ha	30	62	113	87
quantity sugar cane produced	tonnes	2 800	6 055	10 650	8 251

table 3 **selected physical estimates, by size groups** [a]

Australian sugar cane industry average per farm or percentage of farms

		quantity of sugar cane produced													
		under 7.5 kt		7.5–15 kt		15–22.5 kt		22.5–30 kt		30–50 kt		over 50 kt		average	
population	no.	3 130		1 035		349		156		105		49		4 824	
sample	no.	106		89		44		23		17		12		291	
2005-06															
area operated at 30 June	ha	88	(15)	283	(29)	352	(8)	385	(6)	720	(10)	1 293	(18)	184	(11)
milling sugar cane supply and disposal															
area harvested	ha	37	(21)	109	(4)	193	(3)	252	(4)	417	(8)	790	(14)	87	(6)
area irrigated	ha	16	(11)	57	(7)	100	(9)	178	(12)	314	(11)	683	(17)	50	(4)
production	t	3 166	(18)	10 504	(2)	18 324	(1)	25 544	(1)	38 453	(4)	93 091	(14)	8 251	(5)
sugar cane yield	t/ha	84	(5)	97	(3)	95	(3)	101	(3)	92	(10)	118	(4)	95	(2)
quantity sold	t	3 122	(18)	10 365	(2)	17 843	(2)	25 161	(1)	38 047	(3)	92 135	(14)	8 126	(5)
proportion of farms growing other crops															
oilseeds	%	6	(39)	19	(16)	6	(45)	19	(35)	4	(239)	0	(0)	9	(19)
bananas	%	3	(54)	1	(93)	0	(0)	0	(0)	0	(0)	8	(80)	2	(48)
peanuts	%	0	(96)	4	(49)	1	(90)	0	(0)	4	(239)	13	(69)	1	(38)
vegetables	%	8	(63)	1	(65)	0	(0)	3	(141)	5	(180)	3	(101)	6	(58)
other crops	%	11	(42)	12	(28)	3	(87)	4	(94)	6	(185)	13	(87)	11	(31)
2006-07															
milling sugar cane supply and disposal															
area harvested	ha	38	(18)	109	(4)	191	(4)	254	(5)	441	(9)	793	(14)	88	(6)
area irrigated	ha	16	(11)	52	(7)	94	(9)	181	(13)	322	(13)	686	(17)	48	(5)
production	t	3 059	(22)	11 667	(13)	16 954	(3)	24 971	(6)	39 840	(6)	88 924	(15)	8 301	(7)
sugar cane yield	t/ha	80	(5)	107	(13)	89	(3)	98	(2)	90	(5)	112	(4)	95	(4)
quantity sold	t	3 003	(22)	10 015	(3)	16 628	(3)	24 704	(6)	39 451	(6)	87 838	(14)	7 858	(6)

a based on quantity of sugar cane produced.

Note: Figures in parentheses are standard errors, expressed as percentages of the estimates.

hectares (table 2). Sugar cane in Australia is normally grown on a four to five year rotation, with producers harvesting up to 80 per cent of the crop each year. However, in New South Wales, the growing season is between 18 and 24 months, resulting in a lower proportion of the area under cane being harvested each year.

On average, the area of sugar cane harvested in 2005-06 accounted for nearly half of the farm area operated, with relatively small areas sown to other crops – including soybeans, peanuts, bananas and vegetables – on some farms. The smallest farms (in terms of area operated) produced less than 2800 tonnes of sugar cane, compared with the largest producers who harvested more than 10 600 tonnes of cane (table 2). Sugar cane yields averaged around 95 tonnes a hectare in 2005-06 (table 3).

The largest sugar cane growers – in terms of area and quantity of sugar cane produced – are located in the Ord River region of Western Australia, and the Burdekin, Mackay and Herbert regions of Queensland (table 4). Producers in these regions are also the most dependent on irrigation water, with the majority of their crops receiving at least one application of water in 2005-06. In contrast, producers in New South Wales and southern Queensland tend to have smaller farms and are less dependent on irrigation water. However, growers in New South Wales achieved the highest average sugar cane yields of any region in 2005-06 and 2006-07, reflecting the longer growing season in this state.

table 4 **sugar cane production, by region**
Australian sugar cane industry average per farm

	area harvested		yield		sugar cane produced		proportion irrigated	
	2005-06	2006-07	2005-06	2006-07	2005-06	2006-07	2005-06	2006-07
	ha	ha	t/ha	t/ha	t	t	%	%
Far North Queensland	74	73	90	77	6 714	5 602	12	12
Herbert	93	93	98	89	9 163	8 221	13	4
Burdekin	121	123	118	114	14 274	14 063	100	100
Mackay	115	117	82	97	9 416	11 334	81	79
Bundaberg	64	63	84	81	5 411	5 115	95	92
Southern Queensland	69	81	75	75	5 182	6 056	8	7
New South Wales	33	32	154	157	5 079	5 036	3	0
Ord River	262	281	120	116	31 516	32 628	100	100

table 5 **sugar cane yield, by region, 2005-06** average per farm

	irrigated t/ha	non-irrigated t/ha
Far North Queensland	90	91
Herbert	106	97
Burdekin	118	na
Mackay	83	78
Bundaberg	89	34
Southern Queensland	94	65
New South Wales	na	154
Ord River	120	na

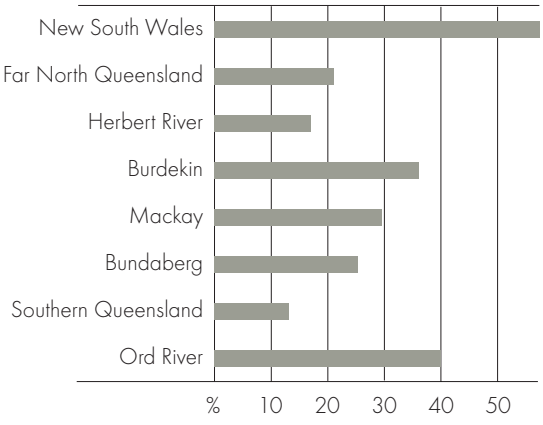
na Not applicable.

Irrigation water is an important input to sugar cane production, with around 60 per cent of farms irrigating crops at least once. The survey results show that large scale producers tend to rely more heavily on irrigation water than smaller scale producers. For instance, farms that produced more than 50 000 tonnes of sugar in 2005-06 irrigated around 87 per cent of their sugar cane crop. In comparison, smaller producers irrigated around half of their crop.

For growers who irrigated crops in 2005-06, the average yield of sugar cane was generally higher than the average yield achieved by nonirrigators across most regions (table 5). The biggest difference in yields between irrigators and nonirrigators occurred in the Herbert, Bundaberg and southern Queensland regions.

In 2006-07, the average area of sugar cane harvested per farm is estimated to have been slightly higher than in 2005-06. With average yields estimated to have remained largely unchanged, average sugar cane production is also estimated to have risen by around 1 per cent in 2006-07.

fig B **proportion of farms reducing sugar cane area, 2006-07**



An estimated 28 per cent of producers reduced the area sown to sugar cane in 2006-07. Overall, these farms were smaller than average in terms of sugar cane area and production. New South Wales and the Ord River region had the highest proportion of farms (57 per cent and 40 per cent respectively) reducing production of sugar cane in 2006-07 (figure B), reflecting increased competition from alternative land uses (including vegetable and beef cattle production).

3

financial performance of sugar cane growers

cash receipts from sugar cane production

In 2005-06, total farm cash receipts for sugar cane growers averaged $281 000, of which almost 80 per cent was from the sale of sugar cane (table 6). Sugar cane growers are paid through a pooling system that results in growers receiving around 90 per cent of their payments during the financial year in which the crop was produced, and the outstanding amount in the following financial year. Pool payments carried over from the 2004-05 crop accounted for around 3 per cent of total sugar cane receipts in 2005-06.

Non sugar related receipts accounted for around 20 per cent of total farm cash receipts, and were largely generated by the sale of beef cattle and crops such as peanuts, oilseeds (principally soybeans), vegetables and fruit. Producers in the Ord River are particularly dependent on the production of vegetables, which accounted for 32 per cent of total farm cash receipts.

Farm cash income for sugar cane growers averaged around $66 600 in 2005-06 (table 7); however, an estimated 27 per cent of producers reported negative farm cash incomes. Most of the farms reporting negative farm cash incomes were smaller sugar cane growers producing less than 7500 tonnes. Average farm cash incomes were highest for sugar cane growers in the Ord River, averaging around $454 000 a farm in 2005-06 (table 7). The lowest average farm cash income was recorded for the Southern Queensland region, estimated to be around $31 600. Other regions with below average incomes included New South Wales and the Bundaberg and Far North Queens-

Farm cash income is a measure of the cash funds available for farm investment and consumption after paying all costs incurred in production, including interest payments, but excluding capital payments and payments to family workers.

Farm business profit is a longer term measure of profitability that takes account of capital depreciation and changes in inventories.

table 6 **financial performance – cash receipts, 2005-06**

Australia sugar cane industry average per farm

		quantity of sugar cane produced											
		under 7.5 kt		7.5–15 kt		15–22.5 kt		22.5–30 kt		30–50 kt		over 50 kt		average	
population	no.	3 130		1 035		349		156		105		49		4 824	
sample	no.	106		89		44		23		17		12		291	
farm cash receipts															
milling sugar cane															
– 2004-05 crop	$	2 726	(12)	10 166	(15)	13 401	(13)	21 758	(14)	27 145	(25)	56 698	(32)	6 795	(7)
– 2005-06 crop	$	82 164	(18)	269 896	(2)	473 152	(2)	670 550	(3)	983 778	(3)	2 538 288	(17)	214 547	(5)
peanuts	$	452	(66)	2 467	(66)	1 347	(90)	0	(0)	3 911	(239)	46 044	(95)	1 475	(43)
oilseeds	$	976	(69)	1 238	(34)	877	(85)	2 732	(47)	2 078	(239)	0	(0)	1 096	(42)
vegetables	$	2 720	(47)	568	(51)	3 426	(95)	1 423	(141)	21 935	(52)	21 031	(101)	2 874	(32)
fruit	$	9 653	(169)	2 673	(44)	0	(0)	4 837	(94)	0	(0)	200 312	(77)	9 040	(118)
other crops	$	758	(71)	849	(76)	149	(83)	1 123	(87)	592	(198)	9 655	(101)	833	(47)
cattle receipts	$	1 000	(216)	2 241	(30)	1 807	(34)	0	(0)	4 687	(92)	57 170	(80)	1 947	(76)
off-farm sharefarming	$	727	(95)	7 093	(50)	13 049	(71)	0	(0)	0	(0)	0	(0)	2 936	(38)
off-farm contracts	$	3 818	(51)	17 144	(32)	32 669	(36)	15 621	(41)	26 732	(74)	92 729	(48)	10 553	(19)
other	$	16 405	(60)	31 304	(9)	60 757	(10)	72 901	(15)	82 550	(21)	285 763	(33)	28 834	(22)
total farm cash receipts	$	121 714	(31)	345 678	(3)	600 633	(3)	790 945	(3)	1 153 407	(7)	3 307 690	(17)	281 143	(9)
total cash costs	$	100 547	(27)	254 080	(4)	435 330	(4)	621 710	(9)	821 976	(5)	2 473 042	(17)	214 565	(8)
farm cash income	$	21 168	(58)	91 597	(10)	165 303	(13)	169 235	(29)	331 432	(22)	834 649	(21)	66 579	(13)
farm business profit	$	– 17 064	(47)	18 263	(55)	69 886	(30)	63 330	(92)	191 045	(29)	584 927	(31)	10 099	(64)
rate of return															
– excl. capital app.	%	–0.5	(127)	1.6	(25)	3.2	(20)	2.6	(41)	4.6	(22)	4.8	(18)	1.4	(23)
– incl. capital app.	%	5.0	(40)	6.4	(21)	6.9	(30)	6.8	(37)	28.7	(38)	8.0	(28)	7.4	(15)
farm capital, 30 June	$m	1.4	(9)	2.5	(7)	3.5	(6)	4.9	(9)	7.3	(11)	19.2	(22)	2.2	(5)
farm debt, 30 June	$	136 865	(11)	189 729	(14)	428 753	(17)	641 348	(24)	1 064 693	(25)	3 843 038	(28)	255 326	(8)
farm liquid assets	$	79 560	(16)	174 191	(31)	194 463	(22)	260 993	(18)	121 458	(48)	597 698	(28)	120 160	(12)
off-farm income	$	29 236	(15)	19 313	(16)	12 601	(32)	17 132	(39)	119 811	(73)	7 849	(61)	27 271	(13)
equity ratio	%	90.9	(1)	92.5	(1)	87.8	(2)	86.9	(3)	86.0	(1)	79.9	(5)	88.3	(1)

Note: Figures in parentheses are standard errors, expressed as percentages of the estimates.

table 7 **selected financial performance indicators, by region and size group, 2005-06** Australian sugar cane industry average per farm

		under 15 kt	15–30 kt	over 30 kt	average
farm cash income					
New South Wales	$	35 961	na	na	37 455
Far North Queensland	$	34 056	173 112	580 824	64 686
Herbert	$	57 070	247 050	429 208	87 947
Burdekin	$	12 850	94 856	580 374	68 462
Mackay	$	56 161	191 592	341 883	86 721
Bundaberg	$	25 450	233 382	na	44 312
Southern Queensland	$	31 568	na	na	31 568
Ord River	$	na	na	na	454 292
Australia	$	38 672	177 801	491 901	66 579
farm business profit					
New South Wales	$	-11 638	na	na	-10 661
Far North Queensland	$	-3 665	64 375	444 422	16 377
Herbert	$	15 140	174 087	269 297	39 795
Burdekin	$	-40 220	22 402	357 579	-342
Mackay	$	4 430	82 265	186 166	22 813
Bundaberg	$	-22 859	142 057	na	-8 892
Southern Queensland	$	-33 613	na	na	-33 613
Ord River	$	na	na	na	366 405
Australia	$	-8 284	83 205	316 649	10 099
rate of return excl. capital appreciation					
New South Wales	%	-0.4	na	na	-0.3
Far North Queensland	%	0.3	2.5	6.4	1.6
Herbert	%	2.6	7.0	4.9	4.0
Burdekin	%	-0.3	2.7	4.9	1.8
Mackay	%	0.9	3.2	3.8	1.8
Bundaberg	%	-0.8	3.4	na	0.3
Southern Queensland	%	-1.0	na	na	-1.0
Ord River	%	na	na	na	7.1
Australia	%	0.3	3.4	4.7	1.4
rate of return incl. capital appreciation					
New South Wales	%	2.9	na	na	3.0
Far North Queensland	%	1.6	2.7	11.1	3.1
Herbert	%	9.3	13.9	11.2	10.7
Burdekin	%	7.8	8.0	6.3	7.4
Mackay	%	5.0	8.3	33.4	9.9
Bundaberg	%	4.2	3.6	na	4.8
Southern Queensland	%	21.1	na	na	21.1
Ord River	%	na	na	na	25.0
Australia	%	5.5	7.0	16.4	7.4

na Not available because of insufficient sample size.

land regions. These regions had a relatively high concentration of small scale sugar cane growers. In the case of New South Wales, the longer growing season helps to boost sugar cane yields but it also restricts the proportion of sugar cane area that can be harvested in each year, and hence producers' incomes.

Nearly two-thirds of sugar cane growers across all regions reported farm business losses in 2005-06 (table 7). However, in 2005-06, the survey results indicate that financial performance improved as the scale of sugar cane production increased in every region. For example, in the Burdekin, farms producing less than 15 000 tonnes of sugar cane reported a loss of around $40 200, compared with a profit of around $22 400 for farms producing 15 000 – 30 000 tonnes of sugar cane and $358 000 for farms producing more than 30 000 tonnes (table 7).

In 2005-06, the average return on capital (excluding capital appreciation) for sugar cane growers is estimated to have been 1.4 per cent. When capital appreciation is taken into account – primarily increases in land values – the average rate of return is estimated to have been around 7.4 per cent. Large farms had the

table 8 **selected estimates, by rate of return, 2005-06**
Australian sugar cane industry average per farm

		bottom 25 per cent of farms		top 25 per cent of farms	
number of farms	no.	951		1 312	
area operated	ha	175	(41)	226	(12)
area of sugar cane harvested	ha	54	(17)	140	(11)
– irrigated area	ha	19	(40)	87	(17)
production of sugar cane	t	4 907	(20)	13 786	(10)
sugar cane yield	t/ha	90	(4)	98	(4)
average sugar cane price received	$/t	27	(3)	29	(1)
unit sugar cane production cost	$/t	23	(6)	17	(3)
total cash receipts	$	159 380	(18)	502 903	(9)
total cash costs	$	181 502	(18)	315 616	(11)
farm cash income	$	–22 122	(43)	187 287	(7)
farm business profit	$	–73 952	(16)	116 153	(10)
rate of return					
– excl. capital appreciation	%	–4.8	(10)	5.9	(7)
– incl. capital appreciation	%	–0.7	(327)	14.0	(21)
farm equity ratio	%	83	(7)	85	(2)

Note: farms ranked by rate of return, excluding capital appreciation.

highest average rate of return on capital (excluding capital appreciation), averaging 4.7 per cent for growers who produced more than 30 000 tonnes of sugar cane, reflecting their ability to generate higher profits per dollar of capital invested than smaller farms.

By ranking the farms surveyed according to their rate of return, excluding capital appreciation, it is possible to estimate the physical and financial characteristics of the bottom and top performing farms. In general, the top performing farms (top 25 per cent of farms when ranked by rate of return excluding capital appreciation) grew larger areas of sugar cane, had higher sugar cane yields and significantly lower unit sugar cane production costs than the bottom performing farms in 2005-06 (table 8).

sugar cane cash costs of production

The survey sought information on the cash costs of producing sugar cane. In 2005-06, sugar cane related production cash costs averaged around $160 800 a farm, ranging from $67 700 a farm for small scale farms (those producing less than 7500 tonnes of sugar cane) to around $1.7 million a farm for large farms producing more than 50 000 tonnes of sugar cane (table 9). Across all farms,

sugar cane unit receipts and costs definitions

Average sugar cane price is a measure of the total cash funds generated from the sale of the 2005-06 sugar cane crop, irrespective of when producers received these funds. Under the pooling system, producers will have received the bulk of these payments in 2005-06; however, some will have been received in 2006-07.

Average sugar cane production cash cost is an estimate of the total cash costs attributable to the production of the 2005-06 crop. These include all cash costs relating to planting, harvesting and marketing this crop. In addition, the interest paid that is attributable to all debts associated with sugar cane production (principally debt related to land and machinery purchases and short term crop financing). Depreciation and imputed family labour allowances are not included as these are not cash costs.

Sugar cane gross margin is a measure of the cash surplus generated from the production of sugar cane. It is calculated by deducting the sugar cane production cash costs from the sugar cane price. These are funds available to pay the operator and family for their labour and to invest in additional capital to expand the farm business.

table 9 **financial performance – cash costs, by size group, 2005-06**

Australian sugar cane industry average per farm

		quantity of sugar cane produced													
		under 7.5 kt		7.5–15 kt		15–22.5 kt		22.5–30 kt		30–50 kt		over 50 kt		average	
sugar cane production															
average price received	$/t	28	(1)	27	(1)	28	(2)	29	(2)	28	(4)	29	(5)	28	(1)
average cash costs of sugar production	$/t	21	(5)	20	(5)	19	(4)	19	(6)	17	(4)	18	(6)	19	(2)
sugar cane gross margin	$/t	6	(18)	7	(12)	8	(12)	10	(10)	11	(12)	11	(15)	8	(6)
sugar cane related production costs															
contracts															
– planting	$	1 203	(62)	2 534	(18)	2 487	(30)	4 606	(31)	5 404	(51)	15 818	(41)	1 933	(26)
– harvesting	$	19 551	(21)	47 816	(7)	86 026	(9)	108 499	(11)	167 983	(29)	130 427	(36)	37 675	(8)
– other	$	1 884	(46)	1 562	(38)	5 666	(49)	6 381	(60)	1 608	(45)	155 531	(36)	3 798	(22)
electricity	$	1 346	(14)	4 456	(13)	5 062	(18)	12 024	(23)	11 566	(66)	53 517	(28)	3 384	(9)
fertiliser	$	13 433	(13)	35 935	(7)	78 378	(5)	85 664	(9)	158 588	(6)	418 769	(25)	32 605	(5)
freight	$	1 069	(34)	3 367	(29)	2 720	(46)	3 498	(41)	6 907	(79)	48 496	(53)	2 372	(19)
fuel, oil and grease	$	6 123	(29)	22 633	(9)	37 724	(11)	42 512	(15)	60 748	(27)	149 430	(24)	15 785	(9)
handling and marketing	$	1 514	(21)	3 765	(9)	8 167	(12)	10 756	(6)	15 218	(4)	33 394	(30)	3 402	(7)
repairs and maintenance	$	6 269	(20)	24 505	(11)	32 538	(12)	51 677	(17)	57 431	(36)	104 768	(36)	15 675	(8)
soil preparation	$	77	(66)	1 162	(30)	1 838	(51)	1 490	(49)	6 403	(85)	14 543	(45)	769	(23)
chemicals	$	2 673	(24)	10 133	(12)	14 992	(12)	22 275	(19)	31 840	(29)	61 160	(20)	7 033	(8)
hired labour	$	1 737	(28)	20 012	(18)	27 322	(22)	32 673	(20)	33 820	(59)	106 138	(25)	10 277	(11)
water	$	1 521	(17)	4 136	(19)	8 278	(32)	24 652	(33)	16 908	(41)	147 696	(27)	5 150	(11)
interest paid	$	5 782	(21)	13 058	(17)	23 218	(19)	41 968	(27)	52 990	(18)	194 946	(26)	12 739	(9)
total	$	67 656	(17)	206 994	(5)	352 099	(4)	478 547	(6)	649 056	(2)	1704 381	(14)	160 841	(5)

Note: Figures in parentheses are standard errors, expressed as percentages of the estimates.

harvesting and fertilisers were the largest cost items, accounting for nearly half of total sugar cane related production costs in 2005-06. Other major cost items included fuel, repairs and maintenance, interest payments, and hired labour.

Overall, the average unit cost of producing sugar is estimated to have been $19 a tonne in 2005-06. However, there was considerable variability in the estimated unit cost of production between the sugar growing regions and size groups (figure C, table 10). On average, the lowest cost producers were located in the Ord River and Herbert regions. Unit production costs are estimated to have been the highest in the Burdekin and Bundaberg regions, averaging around $21 a tonne in 2005-06.

The survey results suggest that there may be some economies of size (whereby average unit costs of production decline as firms expand sugar cane production) in the Australian sugar cane growing industry. The average unit cost of production for the smallest sugar cane growers, by quantity of sugar cane produced, is estimated to have been around $21 a tonne in 2005-06 (table 10). For the largest sugar cane growers, the average unit cost of production in 2005-06 is estimated to have been around $18 a tonne. However, these results do not definitively suggest that larger sugar cane growers are more efficient than smaller sugar cane growers.

The sugar cane gross margin is a measure of the cash surplus generated from the production of sugar cane. It is calculated as the difference between the average price received and unit sugar cane production cash costs. In 2005-06, the average gross margin of sugar cane production is estimated to have been around $8 a tonne (table 10, figure D). Sugar cane production was most profitable for growers in the Ord River and Herbert regions, reflecting the greater concentration of large producers who, in these regions, had significantly lower unit costs of production. In contrast, sugar cane profitability was the lowest for growers in New South Wales and far north Queensland, as producers in these regions received the lowest average price in 2005-06.

fig C **unit cash cost of sugar cane production, by region, 2005-06**

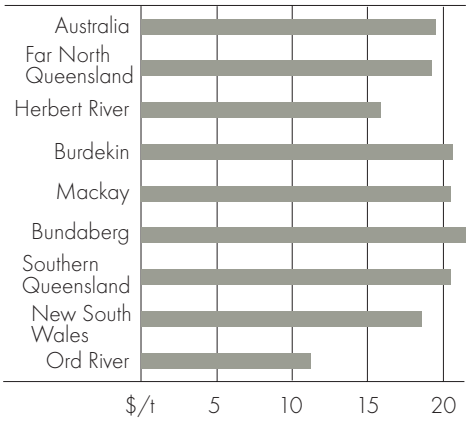


table 10 **gross margin of producers, by region and size group, 2005-06**
Australian sugar cane industry average per farm

	under 15 kt	15–30 kt	over 30 kt	average
	$/t	$/t	$/t	$/t
average sugar cane price				
New South Wales	24	na	na	24
Far North Queensland	26	26	28	26
Herbert	27	26	26	26
Burdekin	28	31	29	29
Mackay	29	29	29	29
Bundaberg	31	30	na	30
Southern Queensland	30	na	na	30
Ord River	na	na	na	34
Australia	27	28	29	28
average sugar cane cash cost of production				
New South Wales	19	na	na	19
Far North Queensland	18	21	20	19
Herbert	16	15	16	16
Burdekin	25	21	17	21
Mackay	21	20	19	20
Bundaberg	25	15	na	21
Southern Queensland	20	na	na	20
Ord River	na	na	na	11
Australia	20	19	18	19
sugar cane gross margin				
New South Wales	4.5	na	na	4.7
Far North Queensland	7.8	4.7	8.0	6.9
Herbert	10.0	10.8	9.7	10.2
Burdekin	2.5	9.0	12.2	8.1
Mackay	7.1	8.5	9.7	8.0
Bundaberg	5.2	13.6	na	7.6
Southern Queensland	8.3	na	na	8.3
Ord River	na	na	na	22.2
Australia	6.6	8.4	10.7	8.1

na Not available due to insufficient sample size.

Selected estimates for the top and bottom 25 per cent of sugar cane growers when ranked by cost of sugar cane production are shown in table 11. In general, the low cost producers grew larger areas of sugar cane than the high cost producers in 2005-06. Low cost producers also achieved higher average sugar cane yields per hectare, but received a slightly lower price per tonne of sugar cane than the average for the group of high cost producers (table 11).

fig D **gross margin of sugar cane production, by region, 2005-06**

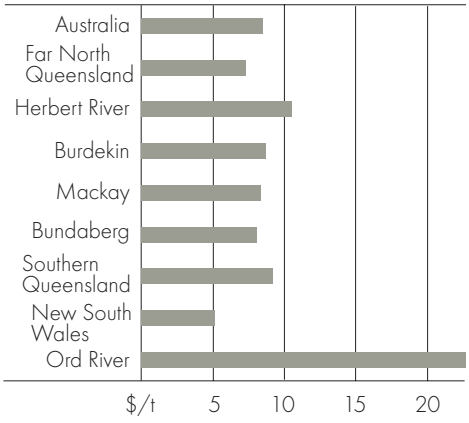


table 11 **selected estimates, by unit cost of sugar cane production, 2005-06**
Australian sugar cane industry average per farm

		bottom 25 per cent of producers		top 25 per cent of producers	
area operated	ha	222	(12)	250	(30)
area sugar cane harvested	ha	128	(10)	81	(9)
– irrigated area	ha	81	(17)	38	(14)
production of sugar cane	t	12 905	(9)	6 559	(11)
sugar cane yield	t/ha	101	(3)	81	(5)
average sugar cane price received	$/t	27	(2)	28	(2)
unit sugar cane production cost	$/t	14	(3)	28	(4)
total cash receipts	$	410 474	(10)	266 990	(11)
total cash costs	$	271 886	(12)	230 031	(10)
farm cash income	$	138 588	(9)	36 960	(38)
farm business profit	$	72 980	(15)	-24 045	(57)
rate of return					
– excluding capital appreciation	%	3.8	(11)	-0.1	(731)
– including capital appreciation	%	13.6	(22)	4.4	(53)
farm equity ratio	%	89	(2)	82	(6)

Note: Farms ranked by unit production costs for sugar cane. Figures in parentheses are relative standard errors, expressed

4

farm management practices

As part of the sugar cane producers survey, ABARE asked a range of supplementary questions to gather detailed information on sugar cane management practices and producers' production intentions and information sources. Some of the key results are highlighted in this section.

farm management plan

In 2005-06, an estimated 33 per cent of sugar cane growers had a written farm management plan (table 12), with nearly all producers' plans containing information on production activities, natural resource management, and business activities. However, of the farms with management plans, only 47 per cent contained information on people management and succession planning. The survey results indicate that the proportion of farm plans including people management and succession planning increased significantly with sugar cane production (table 12), reflecting the greater reliance of larger producers on hired labour.

table 12 **farms with a written plan for managing the farm business, by size group, 2005-06** Australian sugar cane industry

	sugar cane production						
	under 7.5 kt %	7.5–15 kt %	15–22.5 kt %	22.5–30 kt %	30–50 kt %	over 50 kt %	average %
proportion of farms with a plan	28	41	42	47	24	43	33
of farms with a plan, plan includes							
production activities	100	100	88	94	100	100	99
management of natural resources	85	75	69	91	72	100	81
business activities	88	93	92	85	100	71	89
people management/ succession plan	41	51	56	53	71	100	47

Note: Figures in parentheses are standard errors, expressed as percentages of the estimates.

Sugar cane growers that had a written farm management plan are generally younger and likely to have a higher proportion of land planted to sugar cane than those without a farm management plan.

More than a third of sugar cane growers indicated that drought is of critical importance to their farm planning and nearly half of growers indicated that they were adequately prepared or preparing to adapt or cope with future drought conditions (table 13). However, 20 per cent of sugar cane producers (principally located in the Ord River, far north Queensland and Burdekin regions) indicated that drought was either not an issue or not important to their farm planning, reflecting their access to abundant supplies of irrigation water or their location in regions with reliable rainfall during the key growing months.

farmer intentions

As part of the survey, sugar cane growers were asked what plans they had for the near future. Around half of all producers surveyed indicated that they expect to maintain or increase sugar cane production within the next three years, compared with 16 per cent of producers who indicated that they would reduce the area sown to sugar (figure E).

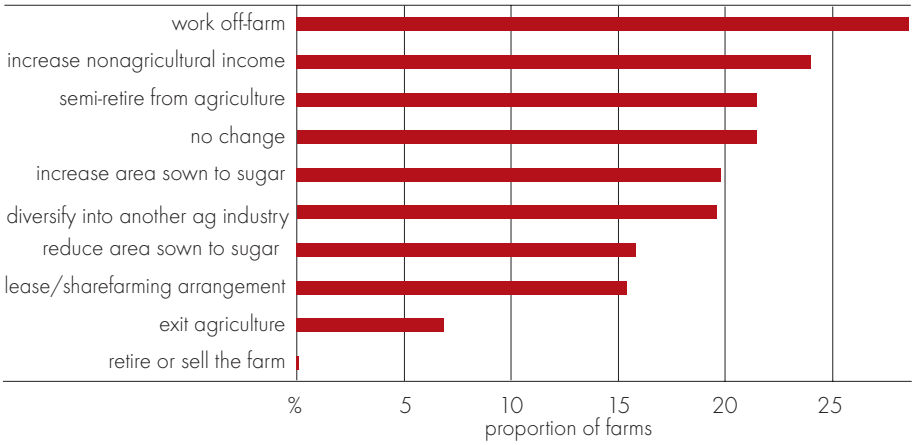
The survey results indicate that larger producers are more likely to expand sugar cane production than reduce it. In 2005-06, 45 per cent of farms producing more than 50 000 tonnes of sugar cane stated that they would increase production in the next three years, while just 3 per cent of these growers indicated that they would decrease production. Large scale growers also indicated that they would seek to diversify their agricultural and nonagricultural income in coming years. Smaller scale producers (less than 7500 tonnes) were more likely to increase off-farm work, expand nonsugar agricultural production, or semi-retire from agriculture in the next three years.

table 13 **importance of drought management, 2005-06** proportion of farms

	%	
importance of drought in business planning		
critical	36	(9)
very important	12	(17)
important	23	(20)
not important	8	(23)
not an issue	20	(20)
preparedness to adapt or cope with drought		
very prepared	5	(58)
prepared	43	(9)
underprepared	12	(19)
not prepared	15	(23)
not an issue	23	(17)

Note: Figures in parentheses are standard errors, expressed as percentages of the estimates.

fig E **expected level of involvement of sugar cane producers in current enterprise in 3 years time, 2005-06**



Between 2005-06 and 2006-07, sugar cane growers in the Ord River region increased the average area sown to sugar by around 5 per cent. However, around 60 per cent of growers in this region indicated that they intended to reduce the area sown to sugar cane in the next three years (figure F). In addition, nearly all of the producers surveyed in the Ord River indicated that they expect to diversify into another agricultural industry within three years, reflecting the higher profitability of alternative crops such as vegetables.

fig F **sugar cane producers who intend to reduce area sown to sugar cane in 3 years time, by region, 2005-06**

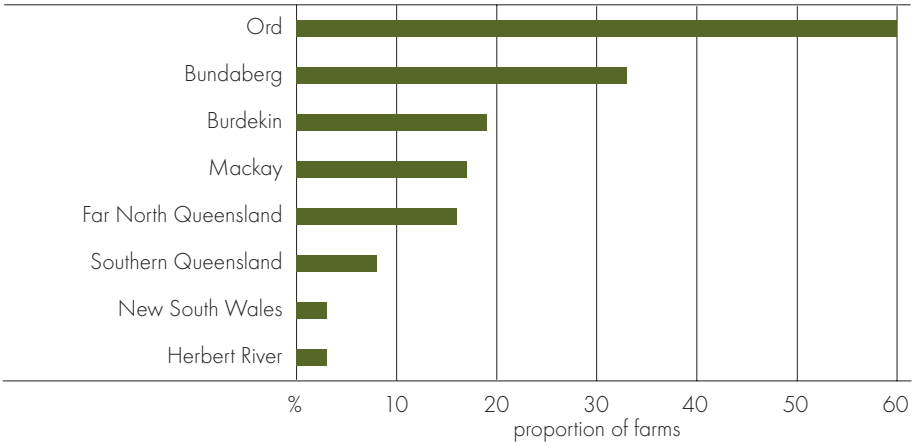
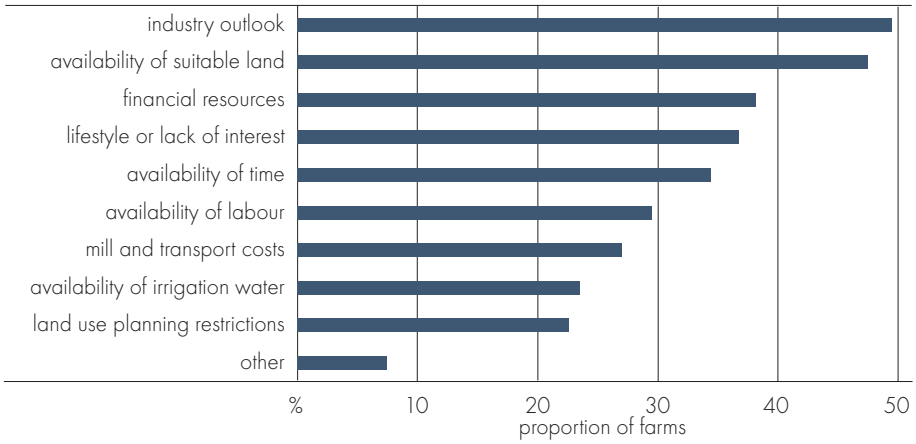


fig G **impediments to farm expansion, 2005-06**



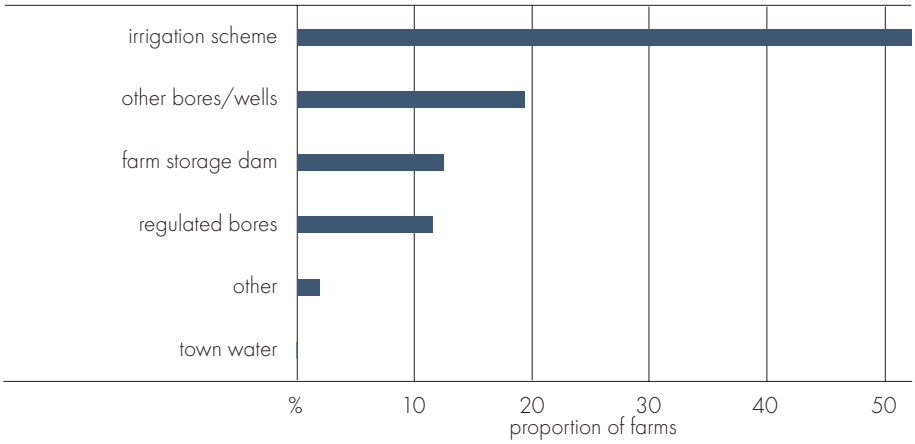
In 2005-06, the two most commonly reported impediments to producers expanding their farm were the availability of suitable land and the sugar cane industry outlook (figure G). Financial resources and lifestyle or lack of interest were also considered to be impediments to farm expansion, particularly for smaller sugar cane growers. Almost two-thirds of large sugar cane producers indicated that further growth in their farm business activities would be impeded by their ability to find labour.

In addition to the sugar cane industry outlook and the availability of suitable lands, producers stated that the most significant impediments to their expansion were the availability of additional irrigation water in the Bundaberg region and land regulations and mill and transport costs in southern Queensland.

irrigation management

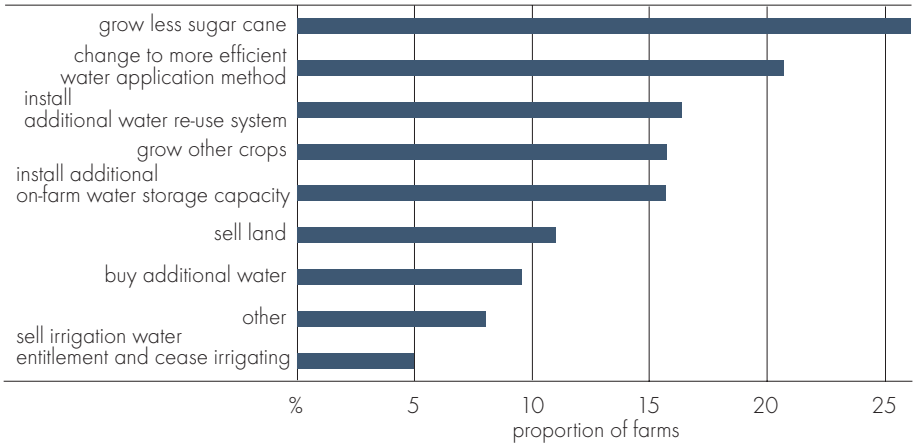
As noted previously, irrigation water is an important input to sugar cane production, with around 60 per cent of farms irrigating crops at least once in 2005-06. The most common source of irrigation water used by sugar cane growers was from an irrigation scheme (figure H). However, in the Herbert and the Burdekin regions, unregulated bores and wells were the dominant source of irrigation water.

fig H **source of irrigation water, 2005-06**



As part of the survey, sugar cane growers were asked what changes they would make in the event of a reduction in irrigation water availability or increased water prices. At the national level, over a quarter of sugar cane growers indicated that they would grow less sugar cane, and around 20 per cent of growers indicated that they would change to a more efficient water application method (figure I).

fig I **likely changes in the event of a reduction in irrigation water availability or increased water prices, 2005-06**



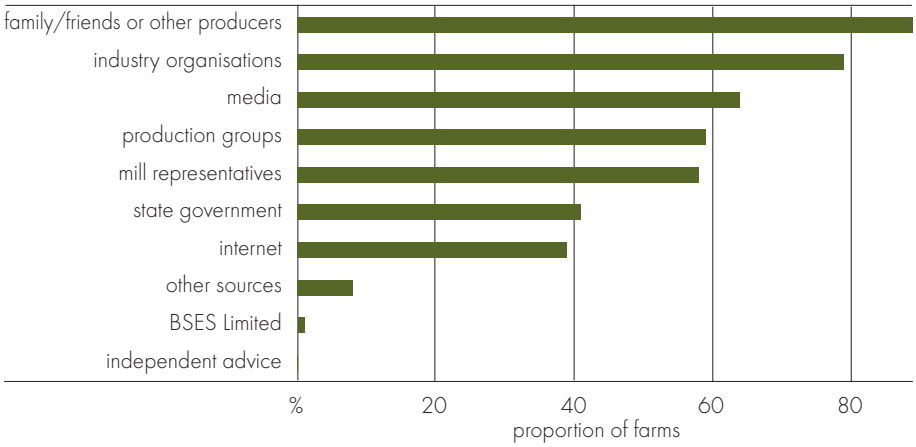
The most intensive use of irrigation occurs in the Bundaberg, Burdekin, Mackay, and Ord River regions, where more than 80 per cent of sugar cane crops are irrigated at least once. With the exception of growers in the Mackay region, more than 70 per cent of growers in these regions indicated that they would grow less sugar cane if the availability of irrigation water decreased or if the price of irrigation water rose significantly. One possible reason why producers in the Mackay region are less likely to reduce sugar cane production is because a large proportion of growers in this region source their irrigation water from on-farm dams and unregulated bores and wells. As a result, farmers in these regions are not as exposed to regulatory changes that affect water availability and price.

Around half of the growers in the intensive irrigation regions also indicated that they would respond to reduced water availability or increased prices by investing in more efficient water application methods and water recycling systems and by increasing on-farm water storage capacity.

information sources

The survey results show that sugar cane producers have actively sought information to better manage their farms. The most common source of information on farm management and production used by sugar cane growers were family, friends and other growers (figure J). Nearly 80 per cent of sugar cane growers obtained

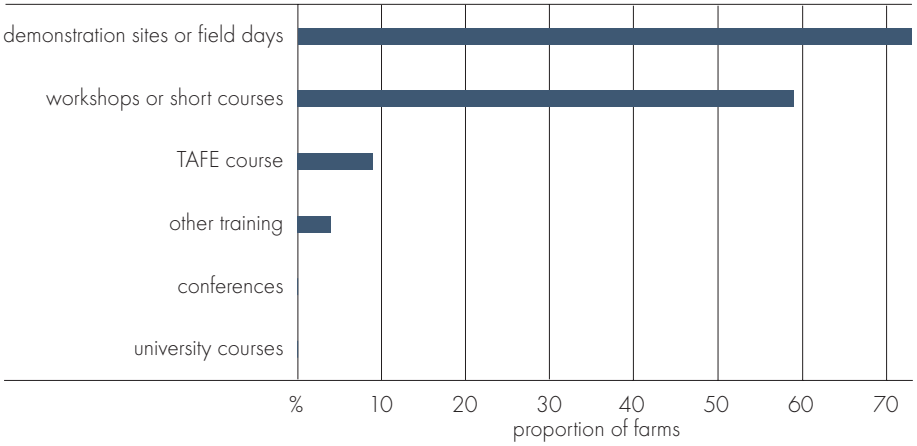
fig J **sources of information for farm management, 2005-06**



information from industry organisations such as cane growers associations and more than 60 per cent sourced information from the media.

In addition to the varied information sources used by sugar cane producers, a large proportion of producers reported that they participated in educational events to improve their farm management and technical skills between July 2004 and June 2006. Field days and workshops were the most important events used to obtain further training and development (figure K).

fig K **proportion of farmers who undertook activities to improve their management and technical skills, 2005-06**



A appendix

survey methodology and definitions

target populations

ABARE surveys are designed and samples selected on the basis of a framework drawn from the Business Register maintained by the Australian Bureau of Statistics (ABS). This framework includes agricultural establishments in each statistical local area classified by size and major industry. The estimates published in this report cover establishments with an estimated value of agricultural operations of $5000 or more. A definition of the estimated value of agricultural operations is given in Australian Standard Industrial Classification (ABS 1983, cat. no. 1201.0).

definition of the sugar growing industry

The sugar cane growing industry definition is based on the Australian and New Zealand Standard Industrial Classification (ANZSIC). This classification is consistent with an international standard that is applied comprehensively across Australian industry, permitting comparisons between industries, both within Australia and internationally. Farms assigned to a particular ANZSIC class have a high proportion of their total output characterised by that class. Further information on ANZSIC and on the sugar cane growing industry is provided in Australian and New Zealand Standard Industrial Classification (ABS 2006, cat. no. 1292.0).

For the purpose of this survey, farms in the sample were selected from units classified in ANZSIC 0151. This class consists of units mainly engaged in growing sugar cane. Primary activities include sugar cane growing.

survey design and sample weighting

The population was stratified by operation size using the estimated value of agricultural operations (EVAO). The size of each stratum was determined using

the Dalenius-Hodges method*. The sample allocation to each stratum was done using a mixture of the Neyman allocation, which takes into account variability within strata of the auxiliary variable, in this case EVAO, and proportional allocation, which only considers the population number in each stratum. The Neyman allocation allocates large proportions of sample to strata with large variability, in the case of this survey, strata of larger farms (Lehtonen and Pahkinen 2004).

The estimates presented in this report are calculated by appropriately weighting the data collected from each sample farm and then using the weighted data to calculate population estimates. Generally, larger farms have smaller weights and smaller farms have larger weights, reflecting the strategy of sampling a higher fraction of larger farms than of smaller farms (the former having a wider range of variability of key characteristics).

reliability of estimates

The reliability of the estimates of population characteristics presented in this report depends on the design of the sample and the accuracy of the measurement of characteristics for the individual sample farms.

sampling errors

Only a small number of farms out of the total number of farms in a particular industry are surveyed. The data collected from each sample farm are weighted to calculate population estimates. Estimates derived from these farms are likely to be different from those that would have been obtained if information had been collected from a census of all farms. Any such differences are called 'sampling errors'.

The size of the sampling error is most influenced by the survey design and the estimation procedures, as well as the sample size and the variability of farms in the population. The larger the sample size, the lower the sampling error is likely to be. Hence, national estimates are likely to have smaller sampling errors than industry and state estimates.

To give a guide to the reliability of the survey estimates, sampling errors have been calculated for all estimates in this report. These estimated errors, expressed as percentages of the survey estimates and termed 'relative standard errors', are given next to each estimate in parentheses.

* Lehtonen, R. and Pahkinen, E. 2004, *Practical Methods for Design and Analysis of Complex Surveys*. John Wiley and Sons, 2nd edition, Finland.

calculating confidence intervals using relative standard errors

Relative standard errors (RSE) can be used to calculate 'confidence intervals' that give an indication of how close the actual population value is likely to be to the survey estimate. To obtain the standard error, multiply the relative standard error by the survey estimate and divide by 100. For example, if average total cash receipts are estimated to be $100 000 with a relative standard error of 6 per cent, the standard error for this estimate is $6000. This is one standard error. Two standard errors is $12 000.

For a 66 per cent confidence interval, there is roughly a two in three chance that the 'census value' (the value that would have been obtained if all farms in the target population had been surveyed) is within one standard error of the survey estimate. This range of one standard error is described as the 66 per cent confidence interval. In this example, there is an approximately two in three chance that the census value is between $94 000 and $106 000 {$100 000 +/– $6000}

For a 95 per cent confidence interval, there is roughly a nineteen in twenty chance that the census value is within two standard errors of the survey estimates (the 95 per cent confidence interval). In this example, there is an approximately nineteen in twenty chance that the census value lies between $88 000 and $112 000, {$100 000 +/– $12 000}

The size of the RSE is mainly influenced by the design of the survey, the sample size and the variability in the population. For example; the larger the sample size, the lower the RSE is likely to be.

comparing estimates

When comparing estimates between two groups, it is important to recognise that the differences are subject to sampling error. As a rough rule of thumb, a conservative estimate (an overestimate) of the standard error of the difference can be constructed by adding the squares of the estimated standard errors of the component estimates and taking the square root of the result.

For example, if the estimates of farm cash income are $59 334 for sugar cane growers in region 1 and $51 664 for sugar cane growers in region 2, with the relative standard errors given as 38 and 42 per cent respectively, then the difference between these two estimates is $7670. The standard error of the difference can be estimated as:

$$(38 \times \$59\,334 / 100) + (42 \times \$51\,664 / 100) = \$31\,292$$

A 95 per cent confidence interval for the difference is:

$$\$7670 \pm 1.96 \times \$31\ 292 = (-\$53\ 662, \$69\ 002)$$

Hence, if 100 different samples are taken, in 95 of them, the difference between these two estimates is between –$53 662 and $69 002. Also, since zero is in this confidence interval, it is possible to say that the difference between the estimates is not statistically significantly different from zero at the 95 per cent confidence level.

definition of terms

owner manager	The primary decision maker for the business. This person is identified by discussion between interviewer and interviewee as (one of) the key decision maker(s). This person is usually responsible for the day to day operation of the business and may own or have a share in the business.
area of land at business premises	Includes all land operated by the business, whether owned or rented by the business.
labour	Measured in work-weeks, as estimated by the owner manager. It includes all work on the business by the owner manager, partners, family, hired permanent and casual workers, but excludes work done by contractors.
hired labour	Excludes the owner manager, partners and family labour, and work undertaken by contractors. Expenditure on contract services appears as a cash cost.
capital	The value of capital employed by the business is the market value of all the assets used including leased items but excluding machinery and equipment either hired or used by contractors. Market valuations are provided by the owner manager of surveyed businesses and include the market value of land and fixed improvements used by the business, excluding the value of the owner manager's house. The house value deducted from the total value of land and fixed improvements is the present day replacement cost, depreciated for age.
debt	Estimated as business debt. It includes all debts attributable to the business, excluding personal debt and underwritten loans. Information collected at the survey interview is supplemented by information in the business accounts.
total cash receipts	Total of revenues received by the business during the financial year, including revenues from the sale of sugar cane, other crops, livestock and livestock products. It includes revenue received from royalties, rebates, refunds, plant hire, contracts, insurance claims and compensation, and government assistance payments.
total cash costs	Payments made by the business for materials and services and for permanent and casual hired labour (excluding partner and other family labour). It includes the value of any lease

	payments on capital, produce purchased for resale, rent, interest, cropping and livestock related purchases. Capital and household expenditures are excluded from total cash costs. Handling and marketing expenses include commission, levies etc. for business produce sold. Administration costs include accountancy fees, banking and legal expenses, postage, stationery, subscriptions and telephone. Other cash costs include relatively small cost items such as stores, advisory services and travelling expenses.
depreciation	Estimated by applying the diminishing value depreciation method to the market value of capital items at 30 June 2006. Capital items are categorised into several groups and relevant depreciation rates are applied. The capital groups include vehicles; handling, harvesting and packing equipment; cultivation and sowing equipment; computers, electronic and communications equipment; other plant and equipment; and buildings on the business premises.
imputed labour cost	Payments for owner manager and family labour may bear little relationship to the actual work input. An estimate of the labour input of the owner manager, partners and their families is calculated in work-weeks and a value is imputed at the relevant Federal Pastoral Industry Award rates.
farm business profit	Cash operating surplus plus buildup in trading stocks, less depreciation, less the imputed value of the owner manager, partner(s) and family labour.
profit at full equity	Return to capital and management plus interest, rent and finance lease payments. It is the return produced by all the resources used in the business.
rate of return	The return to all capital used. It is computed by expressing farm business profit as a percentage of the total opening capital of the business.
equity ratio	Calculated as business equity as a percentage of owned capital at 30 June.
off-farm income	Income not derived from the surveyed farm business. It includes all off-farm income from wages and salaries, other businesses, other investments and Commonwealth social support payments. It is estimated for the owner manager and spouse only.

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07.07

Asia Pacific Economic Cooperation Secretariat

Association of Southeast Asian Nations – secretariat

AusAid

Australian Centre for Excellence in Risk Analysis

Australian Centre for International Agricultural Research

Australian Fisheries Management Authority

Australian Greenhouse Office

Australian Government Department of the Environment and Water Resources

Australian Government Department of Industry, Tourism and Resources

Australian Government Department of Prime Minister and Cabinet

Australian Government Department of Transport and Regional Services

CRC – Plant Biosecurity

CSIRO (Commonwealth Scientific and Industrial Research Organisation)

Dairy Australia

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Department of Primary Industries, Victoria

Fisheries Research and Development Corporation

Fisheries Resources Research Fund

Forest and Wood Products Research and Development Corporation

Grains Research and Development Corporation

Grape and Wine Research and Development Corporation

Independent Pricing and Regulatory Tribunal

International Food Policy Research Institute

Meat and Livestock Australia

Murray Darling Basin Commission

National Australia Bank

NSW Sugar

Rural Industries Research and Development Corporation

University of Queensland

Wheat Export Authority