



**australian vegetable  
growing industry**  
an economic survey 2005-06



**abare research report 07.17**

dale ashton

october 2007

**abare**

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## foreword

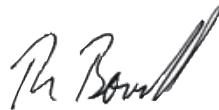
The Australian Vegetable Industry Development Group (AVIDG) was established in 2006 to provide an industrywide perspective on directions for sustainable growth of the vegetable industry. An initial task for the AVIDG was to develop a strategic plan for the industry, called Vegvision 2020. In developing this plan, the AVIDG recognised a need for the vegetable industry to have a better understanding of the key drivers of physical and financial farm performance for vegetable growers.

As a consequence, ABARE was commissioned by the Australian Government Department of Agriculture, Fisheries and Forestry to collect and disseminate representative data on the physical and financial performance of the Australian vegetable growing sector. Following discussions between ABARE and industry stakeholders about the information needs of the industry, an economic survey was designed to collect comprehensive production and financial performance data for 2005-06 and projections of production and receipts for 2006-07. In addition the survey collected information on water and chemical use, pests and diseases, farm production and sale points, sources of information, future intentions, constraints to growth and relationship of growers with main buyers.

The information contained in the report is expected to contribute to policy decisions affecting the future direction and growth of the Australian vegetable growing industry.



Phillip Glyde  
*Executive Director*  
ABARE  
October 2007



Richard Bovill  
*Chairman*  
AVIDG

## acknowledgments

This report draws on data collected from a survey of vegetable growers in Australia. Participation in ABARE farm surveys is voluntary. The success of these surveys depends on the cooperation of farmers and their accountants in providing data. The author wishes to thank the farmers and their accountants who participated in this survey. Without their assistance, the survey would not have been possible.

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## summary

- » In 2006, ABARE was contracted by the Australian Vegetable Industry Development Group (AVIDG) to collect and disseminate representative data on the physical and financial performance of Australian vegetable growing farms in 2005-06 and 2006-07.
- » The survey also collected information on water and chemical use, pests and diseases, farm production and sale points, sources of information, future intentions, constraints and the relationship of growers with their main buyers.

### profile of vegetable growers

- » In 2005-06, there were around 2822 commercial vegetable enterprises - defined as those with an estimated value of agricultural operations greater than \$40 000. Queensland, New South Wales and Victoria had the largest number of commercial vegetable growers, accounting for around two-thirds of vegetable growers across Australia.
- » Potatoes are grown commercially in all states and are the major vegetable crop in terms of area sown, value of production, and volume of consumption.

### farm performance to 2006-07

- » Reflecting widespread drought conditions, the average areas of vegetable crops sown and harvested per farm are estimated to have been lower in 2006-07 than in 2005-06. With average yields being generally lower in 2006-07 than in the previous year, the average quantity of vegetables produced per farm is estimated to have fallen in 2006-07.
- » On balance, the economic performance of vegetable growers in 2005-06 was superior to that of broadacre farmers (wool, beef and cropping farms) in that year. The average rate of return from capital (excluding capital appreciation) among vegetable growers was 3.2 per cent in 2005-06, compared with 0.6 per cent for broadacre farms. In addition, some vegetable growers (particularly those near urban fringes) experienced strong growth in land values during the year, leading to an average return to capital including capital appreciation of 9.2 per cent.

- » Growers in Victoria recorded the highest average farm business profit, estimated to have been around \$138 000 a farm in 2005-06. However, around half of all vegetable growers reported a farm business loss in 2005-06. Most farms that had a business loss were small. Growers in Tasmania recorded the largest farm business loss, averaging around \$72 900 a farm.

### other issues

- » More than two-thirds of vegetable growers indicated that they had undertaken a chemical course in the past three years. Participation rates were highest in New South Wales and Victoria, and lowest in Tasmania and the Northern Territory. The majority of growers had made an effort to reduce overall chemical use per hectare in the past three years.
- » More than three-quarters of growers indicated that they follow a set pest and disease monitoring program, although only 18 per cent of growers in the Northern Territory indicated that they followed such a program.
- » An estimated 18 per cent of vegetable growers produced their vegetable crop under some form of protection, such as a glass, poly, plastic or shade-cloth structure. For these growers, around 80 per cent of total vegetable revenue per farm was produced under protective cropping.
- » As part of the survey, vegetable growers were asked to indicate the priorities that they placed on various areas of research and development. Overall, pest and disease management had the highest proportion of growers indicating it to be of high priority.
- » The survey identified a generally positive outlook among growers, with an estimated 62 per cent of growers indicating that they expected to still be involved in vegetable production within the next five years. In addition, around 32 per cent of growers expected to expand the area of vegetable crops in the next three to five years, primarily by setting up additional vegetable growing areas within the existing farm area.
- » Nearly three-quarters of all vegetable growers across Australia rated the relationship with their main buyer as good or excellent. A similar proportion of growers felt that there was good or excellent cooperation with their main buyer, while 70 per cent of growers rated communication with their main buyer as good or excellent.

# 1

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## introduction

In 2006, the Australian Vegetable Industry Development Group (AVIDG) was established to provide an industrywide perspective on directions for sustainable growth of the industry. An initial task for the AVIDG was to develop a strategic plan for the industry, called *Vegvision 2020*. In developing this plan, the AVIDG recognised a need for the vegetable industry to have a better understanding of the key drivers of the physical and financial performance of vegetable farms.

As a consequence, ABARE was commissioned by the Australian Government Department of Agriculture, Fisheries and Forestry to collect and disseminate representative data on the physical and financial performance of the Australian vegetable growing sector. Following discussions between ABARE and industry stakeholders about the information needs of the industry, an economic survey was designed to collect comprehensive production and financial performance data for 2005-06 and projections of financial performance for 2006-07. In addition the survey collected information on water and chemical usage, pests and diseases, farm production and sale points, sources of information, future intentions, constraints and the relationship of growers with their main buyers.

Face to face interviews were conducted in April 2007 with 266 vegetable growers participating in the survey. For each state and territory a representative sample of farms were selected. A detailed explanation of the sample design is in appendix B.

# 2

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## overview of Australian vegetable production

### *relative importance of domestic vegetable production*

The Australian vegetable production sector is an important supplier of food to the domestic market, supplying most of the fresh vegetables consumed in Australia and also providing vegetable inputs for a large proportion of the processed vegetable products consumed in Australia.

However, despite the sector's importance in supplying food, in economic terms the vegetable production sector is relatively small. Over the period 1999-2000 to 2005-06, vegetable growing accounted for an average of around 6 per cent of the gross value of Australia's agricultural production.

The real gross value of vegetable production grew at an average rate of around 3 per cent a year between 1993-94 and 2001-02 before declining by 9 per cent in 2002-03 due to the effect of drought. The value of production recovered in the three years to 2005-06 to be around levels recorded in 2001-02.

### *industry structure*

Australian vegetable growing enterprises are geographically dispersed, with a presence in all states. The wide range of climate and soils in Australia enables many types of vegetables to be grown in various parts of the country. Potatoes are the major vegetable crop in terms of area sown, value of production, and volume of consumption, and are grown commercially in all states. Tomatoes, carrots, and onions are other major vegetable crops grown in Australia.

New South Wales and Victoria are the largest vegetable growing states in terms of total area sown, while the Northern Territory grew the smallest area of vegetable crops in 2005-06.

## *employment*

Vegetable growing in Australia is typically more labour intensive than other agricultural industries. However, the industry is relatively small in terms of total employment. Data from the Australian Bureau of Statistics indicate that in 2001-02 (2006 Census data unavailable at time of publication) vegetable production directly employed around 23 000 people in Australia, (including seasonal employees) equivalent to around 0.25 per cent of the total Australian employment.

Despite employing a relatively small proportion of the Australian labour force, the importance of vegetable growing varies across regions. For example, in 2001-02, employment in the vegetable growing sector in Tasmania was equivalent to 1.4 per cent of the state's workforce. In Tasmania's north west, however, vegetable growing provided 3 per cent of total employment according to the 2001 Census. These statistics may understate employment in vegetable growing, given that the timing of the Census meant that seasonal employment was not taken into account. In addition, when employment in vegetable processing is considered, the regional importance of vegetable growing is greater.

# 3

## profile of vegetable growers

In 2005-06, there were an estimated 2822 commercial vegetable farms in Australia – defined as farms with an estimated value of agricultural operations greater than \$40 000 and mainly engaged in growing vegetables (table 1). Queensland, New South Wales and Victoria had the largest numbers of commercial vegetable growers, accounting for around two-thirds of vegetable growers across Australia.

For the purpose of this survey, farms in the sample were selected from enterprises mainly engaged in growing vegetables, with primary activities including: capsicums, cucumbers, herbs, lettuces, sprouts, tomatoes, asparagus, beans, carrots, garlic, kumara, melons, onions, peas, potatoes, sugar beet, sweetcorn, and truffles.

The average area operated by vegetable growers in 2005-06 was estimated to have been around 304 hectares per farm. Of this area, around 36 hectares were sown to vegetables, with potatoes and tomatoes being the main crops, and relatively small areas sown to a range of other vegetables. On average, Victoria had the largest area sown to vegetables per farm and the Northern Territory the smallest area (table 2). However, these average sizes mask a wide dispersion of farm sizes and vegetable production activities. Appendix A in this report contains detailed results, by state. As part of the survey, growers were asked to specify

area sown, area harvested, quantity produced, and quantity sold for individual vegetables. However, there were a small number of growers in each state that were unable to separate their vegetables into individual crops. These are shown as 'unspecified vegetables' in this report.

The majority of vegetable growers are small in scale – in terms of area cropped – with relatively small numbers of large vegetable growers. A quarter of farms grew less than 4 hectares of vegetables in 2005-06, while a quarter grew

table 1 **vegetable growers, by state, 2005-06** <sup>a</sup>

	number of growers	survey sample
New South Wales	593	35
Victoria	575	54
Queensland	708	57
South Australia	305	30
Western Australia	256	32
Tasmania	346	50
Northern Territory	39	8
Australia	2 822	266

<sup>a</sup> Number of vegetable growers with an estimated value of agricultural operations greater than \$40 000.  
Source: ABS.

more than 46 hectares of vegetables. As a result, the average is often skewed by the large farms and a median (that is, the 50th percentile) may be a more appropriate statistical measure. For example, most vegetable growers in South Australia are relatively small, with half the farms in that state growing less than 4 hectares of vegetables. However, the average area of vegetables sown in South Australia is estimated to have been around 25 hectares in 2005-06. This average is skewed by a small number of very large vegetable growers in that state.

Most of the vegetable growers surveyed tended to specialise in single vegetable crops, with around two-thirds of growers producing one type of vegetable crop in 2005-06 (table 3). Growers in Tasmania were the most diversified, with around a third of growers in that state producing three or more types of vegetable crops.

table 2 **distribution of vegetable growing farms, by area sown to vegetables, by state, 2005-06**

		value below which specified percentage of farms lie			
		25 per cent	50 per cent	75 per cent	average
New South Wales	ha	4	8	72	44
Victoria	ha	12	24	65	52
Queensland	ha	4	15	44	29
South Australia	ha	1	4	11	25
Western Australia	ha	3	5	20	18
Tasmania	ha	10	19	38	31
Northern Territory	ha	2	2	9	5
Australia	ha	4	14	46	36

table 3 **distribution of vegetable growing farms, by number of vegetable crops, by state, 2005-06**

		1 crop	2 crops	3 crops	more than 3 crops
New South Wales	%	71	25	3	1
Victoria	%	80	12	5	3
Queensland	%	58	21	12	9
South Australia	%	63	22	11	4
Western Australia	%	62	10	16	12
Tasmania	%	41	26	15	18
Northern Territory	%	100	0	0	0
Australia	%	64	9	15	12

# 4

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## farm performance to 2006-07

### *farm physical performance*

In 2005-06, an estimated 56 per cent of vegetable growers reported experiencing drought or below average seasonal conditions (table 4). The states with the highest proportions of growers experiencing drought or below average seasonal conditions in 2005-06 included Queensland (77 per cent), Tasmania (76 per cent) and New South Wales (66 per cent).

Reflecting widespread drought or below average seasonal conditions, the average areas of vegetable crops sown and harvested per farm were estimated to have been lower in 2006-07 than in 2005-06 (table 5). With average yields being generally lower than or unchanged from the previous year, the average quantity of vegetables produced per farm is also estimated to have fallen in 2006-07.

The largest percentage fall in average production per farm was estimated to have been for beans (down by around 52 per cent in 2006-07), with the largest decline occurring in Tasmania (down by around 70 per cent). Tasmania is the main producer of beans in Australia, accounting for nearly 60 per cent of total bean production in 2005-06.

The smallest percentage fall in average production per farm was estimated to have been for carrots (down by around 1 per cent in 2006-07), with increased

table 4 **vegetable growers' assessment of seasonal conditions, by state, 2005-06**

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		<b>average</b>	<b>above average</b>	<b>average</b>	<b>below drought</b>
New South Wales	%	2	31	31	35
Victoria	%	11	57	25	5
Queensland	%	3	14	21	56
South Australia	%	17	53	27	3
Western Australia	%	15	55	30	0
Tasmania	%	5	20	76	0
Northern Territory	%	9	42	49	0
Australia	%	7	35	33	23

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table 5 **area sown, quantity produced and yield, by vegetable crop**  
average per farm

	area sown		quantity produced		crop yield	
	2005-06	2006-07	2005-06	2006-07	2005-06	2006-07
	ha	ha	t	t	t/ha	t/ha
potatoes	12	11	431	391	37	37
pumpkins	1	1	12	11	16	15
green peas	1	1	6	4	6	5
beans	1	1	6	3	5	5
tomatoes	4	2	282	194	80	81
onions	2	2	83	81	54	53
carrots	1	1	47	44	54	52
cauliflowers	2	1	23	22	20	21
other vegetables	6	6	103	97	17	19
unspecified vegetables	7	7	186	303	27	40
total	37	33	1 179	1 150	32	35

carrot production in Western Australia partly offsetting lower production in the other carrot producing states. In Western Australia – the main carrot producing state, accounting for around 40 per cent of total carrot production – carrot production per farm is estimated to have increased by around 7 per cent in 2006-07, because of an increase in the area sown. In Tasmania and Queensland, carrot production per farm fell by an estimated 12 per cent and 13 per cent respectively.

## *farm financial performance*

### **receipts**

On average, receipts from the sale of vegetables accounted for around 87 per cent of total cash receipts for vegetable growing farms in 2005-06. The remainder was largely from the sale of crops other than vegetables. Vegetable growers in Victoria and New South Wales were the most reliant on income from vegetables, with total vegetable receipts accounting for around 93 per cent and 92 per cent respectively of total cash receipts for growers in those states. Vegetable growers in the Northern Territory were the least reliant on income from vegetables.

Overall, potatoes and tomatoes were the major vegetable crops, accounting for an estimated 25 per cent and 18 per cent respectively of total vegetable receipts in 2005-06 (table 6). Income from the sale of potatoes was the major source of

table 6 **contribution of vegetables to total vegetable receipts, by state, 2005-06** average per farm

	NSW	Vic	Qld	SA	WA	Tas	NT	Aust
	%	%	%	%	%	%	%	%
potatoes	19	21	21	39	37	64	0	25
pumpkins	1	0	1	0	0	0	47	1
green peas	1	2	0	0	0	3	0	1
beans	3	1	0	0	0	5	0	1
tomatoes	11	19	30	1	9	2	0	18
onions	4	2	4	15	9	9	0	5
carrots	0	0	8	0	19	5	0	4
cauliflowers	8	2	1	1	3	4	0	3
other vegetables	37	1	23	30	11	7	53	18
unspecified vegetables	15	53	10	12	11	1	0	24
total	100	100	100	100	100	100	100	100

vegetable receipts in South Australia (39 per cent), Western Australia (37 per cent), and Tasmania (64 per cent). In New South Wales, potatoes accounted for 19 per cent of total vegetable receipts, while the category 'other vegetables' accounted for around 37 per cent of receipts. Tomatoes were the major source of vegetable receipts in Queensland, accounting for around 30 per cent of total vegetable receipts in that state. In Victoria, potatoes accounted for around 21 per cent of total vegetable receipts, while a further 53 per cent of receipts could not be separated into individual vegetables by the survey farms in that state. In the Northern Territory, the major source of vegetable receipts was the category 'other vegetables', which accounted for around 53 per cent of receipts with pumpkins accounting for the remaining 47 per cent of receipts.

Total receipts from the sale of vegetables are estimated to have increased by around 2 per cent in 2006-07, with higher vegetable receipts in Victoria, Queensland, Western Australia and the Northern Territory being partly offset by lower receipts in the other states. With production of most vegetable crops declining in 2006-07, the increases in cash receipts were largely the result of higher vegetable prices (table 7).

Total cash receipts for vegetable growers were, on average, around \$638 000 a farm in 2005-06 (table 8). Growers in Victoria had the largest average total cash receipts of all states, estimated to have been around \$878 000 a farm in 2005-06. Vegetable growers in Tasmania had the lowest total cash receipts on average, estimated to have been around \$290 000 a farm in 2005-06.

table 7 **total vegetable receipts and prices received**  
average per farm

	total receipts		price received	
	2005-06 \$	2006-07 \$	2005-06 \$/t	2006-07 \$/t
potatoes	140 530	133 668	336	350
pumpkins	3 965	4 105	337	380
green peas	5 122	6 603	919	1 799
beans	7 743	5 682	1 212	1 676
tomatoes	100 120	109 108	354	561
onions	27 760	29 023	357	372
carrots	23 523	24 568	521	573
cauliflowers	14 701	15 025	664	684
other vegetables	98 922	93 414	901	960
unspecified vegetables	130 385	140 714	710	466
total	552 771	561 910	475	495

### costs

Total cash costs for vegetable growers were, on average, around \$485 000 a farm in 2005-06 (table 8). Largely reflecting the scale of operations, total cash costs were highest for vegetables growers in Queensland (averaging around \$681 000 a farm) and lowest in Western Australia (averaging around \$281 000

table 8 **financial performance estimates for vegetable growers, by state, 2005-06** average per farm

	total cash receipts \$	total cash costs \$	farm cash income \$	farm business profit \$	rate of return <sup>a</sup> %
New South Wales	499 030	359 810	139 210	53 760	2.5
Victoria	878 270	641 420	236 850	137 740	5.0
Queensland	843 280	681 260	162 020	71 140	3.2
South Australia	512 630	396 910	115 720	44 670	4.2
Western Australia	495 180	280 880	214 300	130 970	4.3
Tasmania	289 970	284 620	5 350	-72 930	-1.7
Northern Territory	503 330	342 220	161 110	105 570	7.5
Australia	638 170	485 210	152 960	66 410	3.2

<sup>a</sup> Excluding capital appreciation.

a farm). Across all states (except Tasmania), hired labour was the largest cost item, accounting for around 21 per cent of total cash costs at the national level. Other major cost items included fertiliser and payments to contractors.

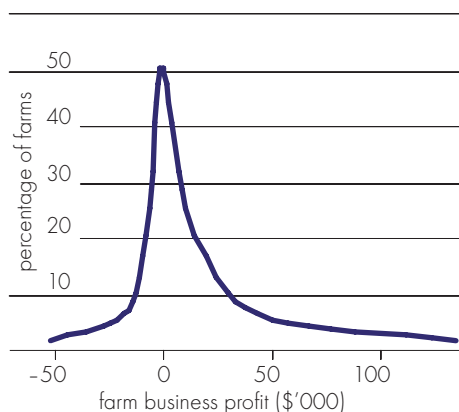
### farm cash income

Growers in Western Australia had the highest ratio of total receipts to costs, although growers in Victoria recorded the highest average farm cash income (total cash receipts minus total cash costs) across all states, estimated to have been around \$237 000 a farm in 2005-06 (table 8). Overall, farm cash income for vegetable growers averaged \$153 000 a farm in 2005-06; however, an estimated 24 per cent of growers reported negative farm cash incomes. Tasmania and the Northern Territory had the highest proportions of growers reporting negative farm cash incomes in 2005-06, estimated to have been 46 per cent and 43 per cent respectively. It appears from the data that the key reason for the low incomes in Tasmania was because growers in that state received prices that were considerably lower than the average prices received by growers in other states.

### farm business profit

Reflecting the above, average farm business profit (farm cash income plus buildup in trading stocks, minus depreciation and unpaid family labour) is estimated to have been \$66 000 in 2005-06. However, around half the farms are estimated to have had negative farm business profits in 2005-06 (figure A). Most of these were

fig A **distribution of vegetable farms, by farm business profit, 2005-06**



small size farms. Growers in Victoria reported the highest average farm business profit in 2005-06, estimated to have been around \$138 000 a farm, while vegetable growers in Tasmania reported an average farm business loss of around \$72 900 a farm in 2005-06 (table 8).

### return on capital

When profits at full equity are taken into account, growers in the Northern Territory had the highest rate of return on capital, excluding capital appreciation, estimated to have been around

7.5 per cent a farm in 2005-06. On balance though, the economic performance of vegetable growers in 2005-06 was generally superior to that of broadacre farms (wool, beef and cropping farms) in that year. For example, the average rate of return to capital (excluding capital appreciation) among vegetable growers was 3.2 per cent in 2005-06, compared with 0.6 per cent for broadacre farms (table 8). In addition, some vegetable growers (particularly those near urban fringes) experienced strong growth in land values during the year, leading to an average return to capital including capital appreciation of 9.2 per cent at the national level.

### new investment

New investment is an important means of boosting farm productivity and incomes, with productivity growth providing better prospects for farm business viability in the longer term. In 2005-06, vegetable growers invested an estimated \$14 500 a farm in acquiring land and expanding the scale of their farm operation. Investment in plant, machinery, vehicles and improvements was also made in 2005-06. Provided these investments are well directed and contribute to further productivity growth and income generating capacity in the future, this level of investment in the industry should be a positive for industry viability.

### financial performance, by area cropped

The survey results indicate that financial performance improved as the scale of vegetable production increased. For example, small farms (those with less than 5 hectares cropped) recorded a rate of return (excluding capital appreciation) of around 0.8 per cent a farm, compared with a rate of return of 4.7 per cent for

table 9 **selected financial performance estimates for vegetable growers, by total area cropped, 2005-06** average per farm

		less than 5 hectares	5-20 hectares	20-70 hectares	more than 70 hectares
farm cash income	\$	48 610	80 570	154 080	336 050
farm business profit	\$	-1 200	24 320	52 910	188 660
rate of return <sup>a</sup>	%	0.8	1.7	2.2	4.7
farms with negative farm cash income	%	20	31	15	27
farm business debt	\$	66 280	91 260	231 640	562 380
debt servicing ratio	%	3	3	2	3

<sup>a</sup> Excluding capital appreciation.

large producers (those with an area cropped of more than 70 hectares) (table 9). Also, a previous study of the vegetable industry by ABARE (Apted et al. 2006) found that larger growers tend to have lower unit costs of production.

### farm business debt and equity

Despite the large number of vegetable growers with poor incomes in 2005-06, most growers entered 2006-07 with relatively high farm equity. Average farm equity ratios ranged from 91 per cent in Western Australia to an estimated 62 per cent in Queensland. However, the relatively high proportion of farms recording negative cash incomes in 2005-06 is likely to have resulted in a significant increase in farm business debt. Many farmers may need to increase borrowings for working capital, particularly those who had low reserves of liquid assets. There may also have been less debt financed investment in land and nonland capital in 2006-07, as farmers are likely to have chosen to defer these types of investments until their incomes improve.

The ability of farmers to service debts from their revenue stream is an important aspect of farm viability. The debt servicing ratio shown in table 9 measures the ratio of interest payments to total farm cash receipts. In most states and across all size groups the debt servicing ratio is relatively low, averaging around 3 per cent at the national level.

In order to better understand the financial situation of vegetable growers, a classification of farms based on the combination of equity and cash flow has been

table 10 **distribution of vegetable growers, by equity ratio and farm cash income, 2005-06** percentage of farms

	farms with low equity		farms with high equity	
	negative cash income %	positive cash income %	negative cash income %	positive cash income %
New South Wales	0	0	18	82
Victoria	0	10	9	81
Queensland	4	3	22	71
South Australia	0	0	22	78
Western Australia	0	9	9	81
Tasmania	0	0	45	55
Northern Territory	0	0	48	52
Australia	1	4	21	74

developed. Farms have been separated into one of four groups according to whether their equity ratio is above or below 70 per cent, and their farm cash income is positive or negative (table 10).

The proportion of vegetable growers reporting low equity ratios was estimated to be around 5 per cent in 2005-06. Farms with low equity and negative cash incomes may have greater difficulty obtaining additional credit, or may be reluctant to take on more debt, to finance recovery from the drought in the short term. For farms with negative cash incomes and low equity, the average debt servicing ratio in 2005-06 was estimated to have been 13 per cent, compared with 2 per cent for farms with positive cash incomes and high equity (table 11).

table 11 **selected estimates, by equity ratio and farm cash income, 2005-06** average per farm

		farms with low equity and negative cash income	farms with high equity and positive cash income
area cropped	ha	68	63
<b>area harvested</b>			
potatoes	ha	26	12
pumpkins	ha	0	1
green peas	ha	0	1
beans	ha	0	1
tomatoes	ha	0	2
onions	ha	1	1
carrots	ha	0	1
cauliflowers	ha	0	2
other vegetables	ha	2	5
unspecified vegetables	ha	7	6
total cash receipts	\$	367 240	653 420
total cash costs	\$	492 160	437 930
<b>farm cash income</b>	\$	-124 930	215 490
<b>farm business profit</b>	\$	-203 360	129 020
debt servicing ratio	%	13	2
rate of return <sup>a</sup>	%	-6.2	5.4

<sup>a</sup> Excluding capital appreciation.

## financial performance of potato and tomato growers

Table 12 shows selected estimates for growers specialising in tomatoes compared with estimates for growers specialising in potatoes. For this analysis, specialists have been defined as those farms growing either potatoes or tomatoes, but not both. Overall, specialist potato growers operate larger farms and grow a broader range of vegetables than specialist tomato growers. Reflecting the relative scale of each type of operation, specialist tomato growers have much higher cash receipts and costs than specialist potato growers. Both groups of growers generated similar receipts per dollar of input costs in 2005-06. However, average rates of return to capital for specialist tomato growers (5.5 per cent in 2005-06) were much higher than returns for specialist potato growers (1.7 per cent). In comparison, the average rate of return for the remaining vegetable growers surveyed (that is, those that weren't specialist potato or tomato growers) was 4.2 per cent in 2005-06.

table 12 **selected estimates, specialist potato and tomato growers, 2005-06** average per farm

		specialist tomato growers	specialist potato growers
area operated	ha	207	534
area vegetables cropped	ha	27	40
<b>area harvested</b>			
potatoes	ha	0	32
pumpkins	ha	0	0
green peas	ha	0	1
beans	ha	0	1
tomatoes	ha	24	0
onions	ha	0	2
carrots	ha	0	1
cauliflowers	ha	0	2
other vegetables	ha	1	1
unspecified vegetables	ha	2	0
total cash receipts	\$	811 200	530 570
total cash costs	\$	632 460	415 400
<b>farm cash income</b>	\$	178 740	115 170
<b>farm business profit</b>	\$	103 990	20 530
debt servicing ratio	%	2	5
rate of return <sup>a</sup>	%	5.5	1.7

<sup>a</sup> Excluding capital appreciation.

### *comparison of results with previous survey*

In 2005 ABARE undertook a survey of vegetable growers in northern Tasmania, Victoria, south east Queensland and Western Australia. The results of this survey were published in Apted et al. (2006). The target populations for this survey were narrower than for the 2006 survey, being limited to growers of any of the following vegetables: carrots, cauliflowers, onions, peas, potatoes and tomatoes.

Overall, the economic performance of vegetable growers in the 2006 survey was largely the same as the performance of survey farms in 2005. For example, the average rate of return to capital (excluding capital appreciation) among vegetable growers in the 2006 survey was 3.2 per cent, compared with 3.1 per cent in 2005. However, any comparisons between the two surveys should be treated with caution because of the narrower focus of the 2005 survey.

Nevertheless, a key result arising from both surveys is the generally positive relationship between unit production cost and economic performance. For example, low cost growers in both years were found to be larger in terms of capital invested and areas cropped and irrigated, and generated higher levels of profit and rates of return to capital. Also, while low cost farms have significant levels of debt, they typically generate incomes high enough to service that debt effectively.

# 5

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## other issues

The survey also provided an opportunity to collect additional information from vegetable growers relating to other aspects of their businesses. Questions asked included information on water and chemical use, pests and diseases, farm production and sale points, sources of information, future intentions, constraints and the relationship of growers with main buyers. Key results are presented below.

### *irrigation*

Irrigation water is an important input to vegetable production. An estimated 82 per cent of vegetable farms irrigated their vegetable crops in 2005-06. In general, nearly the entire area of each vegetable crop sown was irrigated on these farms in 2005-06. Farms that did not irrigate in 2005-06 were generally small sized farms, with an average area of vegetables sown of around 1 hectare. In comparison, the average area of vegetables sown on irrigating farms was around 41 hectares in 2005-06.

New South Wales irrigators had, on average, the largest area of vegetable crops irrigated, while Northern Territory growers had the smallest, generally reflecting the distribution of farms by area operated. In all states, potatoes were the main vegetable crop irrigated in 2005-06 (table 13).

The main sources of irrigation water used by vegetable growers in 2005-06 were groundwater bores, farm storage dams and irrigation scheme supplies, accounting for 31 per cent, 28 per cent and 26 per cent respectively of total water use (table 14). Groundwater was the most common source of irrigation water in Queensland, South Australia, Western Australia and the Northern Territory. Farm storage dams were the most common source of irrigation water in New South Wales and Tasmania, while irrigation scheme supplies were the most common source of irrigation water in Victoria.

Around 55 per cent of growers indicated their intention to increase the amount of irrigation water available to their farm, primarily by increasing the size of on-farm storages (table 15). Around 16 per cent of growers intended to purchase additional water entitlements.

table 13 **area irrigated, crop yield and water applied, by vegetable crop, 2005-06** <sup>a</sup> average per farm

	area irrigated	production	crop yield	water applied
	ha	t	t/ha	ML
potatoes	13	453	36	56
pumpkins	1	12	15	3
green peas	1	5	6	1
beans	1	6	5	2
tomatoes	4	302	79	22
onions	2	88	53	7
carrots	1	50	48	3
cauliflowers	2	24	15	2
other vegetables	7	108	16	14
unspecified vegetables	7	198	27	21
total	39	1 246	32	131

<sup>a</sup> Farms that irrigated vegetable crops in 2005-06.

 table 14 **source of irrigation water, by state, 2005-06** average per farm

	NSW	Vic	Qld	SA	WA	Tas	NT	Aust
	%	%	%	%	%	%	%	%
irrigation scheme	35	35	19	24	23	15	0	26
groundwater bore	6	24	52	56	35	7	90	31
diversion from river/stream	1	5	3	0	0	8	10	3
town water (mains supply)	5	10	7	14	7	2	0	7
farm storage dam	40	20	17	3	33	67	0	28
treated or reclaimed water	0	1	0	3	0	0	0	1
other	3	1	3	0	2	0	0	2

 table 15 **farms intending to increase irrigation water use, by state, 2005-06**  
percentage of farms

	NSW	Vic	Qld	SA	WA	Tas	NT	Aust
	%	%	%	%	%	%	%	%
intending to increase irrigation water use	59	61	55	39	39	72	15	55
<b>source of additional water</b>								
- increase on-farm storage	39	19	19	6	13	60	0	26
- increase water reuse	0	3	5	2	3	5	0	3
- purchase entitlements	22	22	17	5	5	16	9	16
- access treated water	0	8	8	20	0	3	0	6

## chemical use

Over two-thirds of vegetable growers indicated that they had undertaken a chemical course in the past three years (table 16). Participation rates were highest in New South Wales and Victoria, and lowest in Tasmania and the Northern Territory. The majority of farms (around 84 per cent) had made an effort to reduce overall chemical usage per hectare in the past three years. Similarly, most farms in each state except New South Wales and the Northern Territory tested produce for chemical residues to verify that chemicals were applied correctly or that maximum allowable residue level levels were not exceeded.

table 16 **chemical use, by state, 2005-06**  
percentage of farms

	NSW %	Vic %	Qld %	SA %	WA %	Tas %	NT %	Aust %
growers undertaking chemical course in the past 3 years	80	78	63	68	57	50	46	68
growers reducing chemical use per ha in the past 3 years	80	84	89	87	73	87	88	84
growers testing for chemical residues	31	70	72	73	63	67	34	61

## pests and diseases

Over three-quarters of vegetable growers indicated that they follow a set pest and disease monitoring program, although only 18 per cent of growers in the Northern Territory followed such a program (table 17). Most of those growers that did not follow a set pest and disease monitoring program undertook routine surveillance for pests and diseases. The Northern Territory was the exception where casual

table 17 **pests and diseases, by state, 2005-06**  
percentage of farms

	NSW %	Vic %	Qld %	SA %	WA %	Tas %	NT %	Aust %
farms following a pest and disease monitoring program	85	90	73	76	64	70	18	77
support for a growers levy	61	76	69	95	77	78	88	74
support for grower compensation	86	69	63	79	69	83	84	74

surveillance (around 44 per cent of growers) and intermittent surveillance (around 17 per cent of growers) were the main methods for monitoring pests and diseases.

In the survey, growers were asked to consider whether, in the event of an exotic pest or disease outbreak, they would support a grower levy that would be matched by government funding to meet the costs of eradication. Growers were also asked whether they would support using the proceeds from an industry levy and joint government funding to compensate growers for lost income if crops were destroyed as part of the eradication effort. In both cases, nearly three-quarters of growers indicated their support for a levy to be used for such purposes.

### vegetable production and selling methods

An estimated 18 per cent of vegetable growers produced their vegetable crop under some form of protection – such as glass, poly, plastic or a shade cloth structure – in 2005-06 (table 18). For these growers, around 80 per cent of total vegetable revenue per farm, on average, was produced under protective cropping.

Vegetable growers typically sell their outputs into one of three different markets or segments: the fresh vegetable market; the processed vegetable market; and the export market. In 2005-06, an estimated 53 per cent of vegetable growers sold on average 62 per cent of the value of their output to the fresh vegetable market in their local capital city wholesale market (table 19). This was the most common selling method in each state except Tasmania and the Northern Territory. In the Northern Territory, all growers surveyed sold their produce interstate. In Tasmania, an estimated 95 per cent of growers sold their produce directly to a processor.

For other selling methods, around 31 per cent of growers sold their outputs interstate, with these sales accounting for around 62 per cent of the value of outputs from these farms. A further 31 per cent of growers sold their outputs directly to a processor, with these sales accounting for around 84 per cent of the value of output from these farms.

table 18 **vegetable production methods, 2005-06** average per farm or percentage of farms

	<b>Australia</b>
	%
proportion of growers producing vegetables under protection	18
share of vegetable revenue produced under protection <sup>a</sup>	80

<sup>a</sup> Average for those farms producing vegetable crops under protection.

table 19 **vegetable selling methods, by state, 2005-06**

average per farm or percent of farms

	NSW	Vic	Qld	SA	WA	Tas	NT	Aust
	%	%	%	%	%	%	%	%
<b>proportion of growers selling</b>								
- for export	2	5	7	5	13	5	0	6
- direct to food services	5	8	1	0	6	2	0	4
- interstate	21	29	50	42	12	6	100	31
- local capital wholesale	61	41	70	65	72	7	0	53
- local market	45	23	18	9	18	2	0	21
- direct to processor	21	39	13	19	15	95	0	31
- direct to retail	21	17	16	4	32	5	0	16
<b>proportion of produce sold (by volume)</b>								
- for export	0	3	1	2	3	1	0	2
- direct to food services	2	6	0	0	0	0	0	2
- interstate	17	15	30	27	5	1	100	19
- local capital wholesale	38	21	39	47	61	2	0	33
- local market	23	7	11	7	8	0	0	11
- direct to processor	15	33	8	15	10	92	0	26
- direct to retail	4	14	11	1	13	3	0	8
- total	100	100	100	100	100	100	100	100

## education and training

Growers were asked to indicate their participation in a variety of courses or training activities during the two years to June 2006 to improve their farm management and technical skills. The most popular events in which growers participated were field days (67 per cent of growers) and workshops (50 per cent of growers) (table 20).

table 20 **education and training, by state, 2005-06**

	NSW	Vic	Qld	SA	WA	Tas	NT	Aust
	%	%	%	%	%	%	%	%
<b>proportion of growers attending</b>								
- conferences	23	35	27	38	37	58	24	34
- field days	61	76	56	65	62	96	34	67
- TAFE	24	6	3	9	0	12	6	9
- university	0	0	0	0	0	0	0	0
- workshops	53	49	34	67	63	59	34	50
- other	14	0	3	7	4	4	0	5

## use of computers

Nearly two-thirds of vegetable growers across Australia use a computer to manage their vegetable business (table 21). The majority of these growers also made use of the internet in managing their business. The most common use of the internet was to assist vegetable growers with managing their financial affairs, including account keeping, banking, and paying accounts.

table 21 **use of computers in vegetable business, by state, 2005-06**

	NSW %	Vic %	Qld %	SA %	WA %	Tas %	NT %	Aust %
<b>proportion of growers using a computer</b>								
in their business:	55	88	58	54	61	76	55	65
- internet use	52	85	56	54	61	76	55	64
- education resources	27	28	16	31	24	37	49	26
- financial affairs	47	72	53	54	48	65	55	57
- industry links	37	46	30	26	38	61	55	39
- market information	36	47	18	27	33	43	49	34
- media releases	21	27	17	25	24	22	14	22
- weather information	42	71	41	45	49	69	34	52
- purchasing farm inputs	16	20	24	15	22	28	14	21
- other	14	0	0	9	7	2	0	5

## research and development priorities

As part of the survey, vegetable growers were asked to indicate the priorities they placed on various areas of research and development, including pest and disease management; obtaining more productive or higher yielding varieties; improving farm productivity in general (apart from higher yielding varieties); marketing and market development; chilling and storage technology; and environmental sustainability. Overall, the area of research and development with the highest proportion of growers indicating it to be of high priority was pest and disease management (table 22). The area of research and development given the lowest overall priority by vegetable growers was improvements in chilling and storage technology.

table 22 **research and development priorities, by state, 2005-06**  
percentage of farms

	NSW	Vic	Qld	SA	WA	Tas	NT	Aust
	%	%	%	%	%	%	%	%
<b>pest and disease management</b>								
very high	72	46	54	59	48	49	58	56
high	20	38	31	22	40	42	42	32
medium	7	13	12	19	11	9	0	11
low	1	3	1	0	0	0	0	1
none	0	0	2	0	0	0	0	0
<b>higher yielding varieties</b>								
very high	40	30	38	50	22	50	5	38
high	26	50	17	23	36	37	84	31
medium	24	18	19	18	26	13	0	19
low	11	0	20	4	12	0	12	9
none	0	1	5	0	2	0	0	2
<b>farm productivity</b>								
very high	28	39	16	23	13	35	22	26
high	57	43	44	39	47	48	46	47
medium	13	13	18	21	26	17	33	17
low	3	5	17	4	7	0	0	7
none	0	0	2	0	7	0	0	1
<b>market development</b>								
very high	49	41	25	50	18	32	0	36
high	32	16	33	22	42	46	20	31
medium	15	28	14	15	15	16	66	18
low	3	12	20	7	19	4	14	11
none	2	3	3	5	5	2	0	3
<b>storage technology</b>								
very high	33	17	14	21	10	10	21	19
high	13	24	25	23	7	28	54	21
medium	36	24	22	22	21	48	20	28
low	17	31	33	25	31	11	0	25
none	1	3	6	5	26	3	5	6
<b>environmental sustainability</b>								
very high	59	46	30	38	34	21	31	39
high	24	37	32	40	23	46	69	34
medium	11	7	24	22	27	25	0	18
low	0	9	10	0	12	6	0	6
none	0	0	5	0	4	2	0	2

Percentages may not add to 100 due to rounding.

## marketing and value adding

Growers were asked to indicate the level of value adding they conduct on their farm. Around half of all growers across Australia indicated that they undertook some value adding in 2005-06, with around a quarter of growers undertaking a high or very high level of value adding (table 23). Around 43 per cent of growers expected to undertake more value adding on their farm in the future, while 41 per cent of growers expected to get more involved in marketing and supply chain relationships in the future.

table 23 **marketing and value adding, by state, 2005-06**  
percentage of farms

	NSW %	Vic %	Qld %	SA %	WA %	Tas %	NT %	Aust %
<b>level of value adding</b>								
very high	12	14	4	10	3	0	0	8
high	5	28	20	9	28	11	33	17
medium	25	30	16	14	21	38	5	24
low	35	22	24	38	31	30	53	29
none	23	5	35	27	18	22	9	22
expect more value adding	48	37	42	42	43	46	47	43
expect more marketing	44	31	45	51	32	49	14	41

## future in vegetable growing

Growers were asked to indicate what they expected to be doing in five years time. An estimated 62 per cent of growers indicated that they expected to still be involved with vegetable production within the next five years (table 24). In addition, around 32 per cent of growers expected to expand the area of vegetable crops in the next three to five years, primarily by setting up additional vegetable growing areas within the existing farm area.

Growers were asked to indicate a range of management practices that would improve the productivity of their farm business. The most common responses were to introduce more productive or higher yielding vegetable varieties (59 per cent of growers), and to introduce or expand mechanisation (54 per cent of growers). Around 13 per cent of growers believed that they were already as productive as possible.

table 24 **future in vegetable growing, by state, 2005-06**

percentage of farms

	NSW	Vic	Qld	SA	WA	Tas	NT	Aust
	%	%	%	%	%	%	%	%
<b>intentions in five years</b>								
vegetable production	66	62	71	72	65	25	76	62
other agricultural production	21	28	11	2	10	47	0	20
leave agriculture	13	10	18	25	25	27	24	18
<b>intention to expand vegetable production in next 3-5 years</b>								
- use land more intensively <sup>a</sup>	77	65	24	52	33	30	18	47
- additional vegetable area <sup>a</sup>	85	53	57	83	66	48	46	64
- purchase more land <sup>a</sup>	54	58	33	17	49	52	54	44
- lease more land <sup>a</sup>	64	33	28	38	14	62	0	37
- sharefarming arrangement <sup>a</sup>	51	16	11	0	15	36	0	20
<b>management practices to improve farm productivity</b>								
expand mechanisation	62	61	48	56	46	38	95	54
introduce new technology	43	34	28	45	14	49	11	35
increase scale of operation	7	0	8	0	22	4	0	6
higher yielding varieties	61	62	50	66	56	63	68	59
introduce gm vegetables	35	15	19	35	29	19	6	24
do nothing	19	3	14	14	30	8	10	13
other	71	70	56	72	47	61	63	64
<b>major growth opportunity</b>								
exports	11	13	13	21	43	25	10	17
selling direct to retail	18	41	35	22	37	24	10	30
direct to food services sector	14	23	22	15	18	7	10	17
niche products	48	32	34	41	30	33	21	37
high quality produce	65	61	49	42	52	75	35	57
value adding on farm	22	33	18	21	35	24	36	25
under protective cropping	18	12	9	13	11	5	21	12
hydroponics	14	6	7	13	2	5	0	8
other	11	1	7	4	18	4	5	7
<b>constraints to changing vegetable mix</b>								
physical	59	40	57	48	37	51	9	50
knowledge/experience	10	17	24	9	40	29	5	20

<sup>a</sup> Percentage of farms expecting to expand area of vegetables in the next three to five years.

Growers were also asked to indicate the major growth opportunity for the vegetable growing business. The most common response was to produce high quality products (57 per cent of growers). However, around half of all vegetable growers indicated there were physical constraints (such as soil type, topography, climate, or water availability) that may prevent them from changing their vegetable crop mix, while 20 per cent of growers felt that a lack of knowledge or experience may prevent them from changing their vegetable crop mix.

Growers were also asked to indicate whether there were major impediments preventing them from developing export markets (table 25). The most common responses were that prices were not high enough to warrant the additional investment required (47 per cent of growers) and that it would be too time consuming (44 per cent of growers).

Increased farm input costs were cited by the majority of vegetable growers across Australia as a major threat to the future viability of the vegetable growing business. Other key threats included low prices (68 per cent), availability of irrigation water (63 per cent), and increased marketing costs (60 per cent).

table 25 **impediments to developing vegetable business, by state, 2005-06**  
percentage of farms

	NSW	Vic	Qld	SA	WA	Tas	NT	Aust
	%	%	%	%	%	%	%	%
<b>impediments to developing export markets</b>								
no local agents	13	7	7	9	9	8	0	9
prices not high enough	51	41	39	41	60	68	9	47
shipping costs too high	44	19	15	33	5	24	5	24
transport not available	15	7	11	14	2	3	0	9
infrastructure on farm needed	39	19	18	19	6	30	0	23
too time consuming	39	48	40	55	32	53	54	44
<b>threats to business viability</b>								
increased farm input costs	95	93	88	94	75	92	95	91
increased marketing costs	57	70	60	56	50	56	68	60
low prices	65	75	58	73	49	91	59	68
availability of irrigation water	75	64	68	71	35	55	0	63
environmental sustainability	36	20	32	25	12	26	32	27
urban expansion	25	21	22	32	43	6	21	23
closure of local processing	15	18	7	2	5	34	0	13
access/cost of labour	62	42	56	32	54	55	20	51
other	24	3	3	18	21	2	5	11

## relationship with main buyer

Nearly three-quarters of all vegetable growers across Australia rated the relationship with their main buyer as being good or excellent (table 26). A similar proportion (72 per cent) of growers felt that there was good or excellent cooperation with their main buyer, while 70 per cent of growers rated communication with their main buyer as good or excellent. An estimated 69 per cent of growers felt the feedback they received from their main buyer regarding products and product qualities expected from consumers was good or excellent.

table 26 **relationship with main buyer, by state, 2005-06**  
percent of farms

	NSW %	Vic %	Qld %	SA %	WA %	Tas %	NT %	Aust %
<b>rating of relationship with main buyer</b>								
excellent	18	40	52	37	31	15	14	34
good	47	35	29	44	43	48	65	39
satisfactory	11	19	15	14	12	24	0	15
poor	11	7	4	0	2	13	22	7
none	14	0	0	5	12	0	0	5
<b>level of cooperation with main buyer</b>								
excellent	14	34	51	28	26	8	35	29
good	53	43	27	52	58	42	39	43
satisfactory	23	17	15	14	10	29	16	19
poor	0	5	7	4	0	21	10	6
none	10	0	0	2	6	0	0	3
<b>rating of communications with main buyer</b>								
excellent	16	36	48	25	26	8	41	29
good	47	38	34	57	41	40	33	41
satisfactory	22	22	10	14	14	41	26	20
poor	2	4	9	4	14	11	0	7
none	14	0	0	0	6	0	0	3
<b>feedback from main buyer</b>								
excellent	24	26	42	35	13	6	20	27
good	34	50	42	29	53	45	66	42
satisfactory	13	19	5	23	9	28	5	15
poor	13	5	11	14	20	19	10	12
none	16	0	0	0	6	2	0	4

## selected estimates, by state

- A1 cash receipts, by state
- A2 cash costs, by state
- A3 financial performance, by state
- A4 area of vegetable sown and harvested, by state
- A5 vegetable production, by state
- A6 quantity of vegetables sold, by state
- A7 area irrigated and irrigated vegetable production, by state
- A8 volume of irrigation water applied, by state

table A1 cash receipts – vegetable growers, by state

average per farm

	New South Wales		Victoria		Queensland		South Australia	
	2005-06	2006-07	2005-06	2006-07	2005-06	2006-07	2005-06	2006-07
cash receipts	\$	\$	\$	\$	\$	\$	\$	\$
potatoes	86 970	53 440	168 440	136 980	148 380	187 010	171 920	162 470
pumpkins	6 000	7 560	250	540	7 230	7 450	590	1 750
green peas	5 080	7 810	13 230	18 580	1 260	2 630	900	1 200
beans	14 480	15 060	11 260	5 890	3 310	2 420	1 500	210
tomatoes	52 200	36 230	152 310	227 140	212 580	199 380	5 160	6 080
onions	18 390	8 140	16 650	17 130	29 120	36 420	66 480	64 950
carrots	0	0	0	0	58 850	64 650	0	0
cauliflowers	36 610	36 680	14 000	15 090	5 440	4 880	5 060	5 550
other vegetables	166 910	167 880	6 990	3 580	164 400	138 140	131 040	126 490
unspecified	67 980	81 180	430 250	468 330	71 410	74 480	54 450	41 440
other cash receipts	44 420	na	64 890	na	141 310	na	75 530	na
total cash receipts	499 030	na	878 270	na	843 280	na	512 630	na

table A1 cash receipts – vegetable growers, by state  
average per farm continued

	Western Australia			Tasmania			Northern Territory			Australia		
	2005-06	2006-07	2005-06	2005-06	2006-07	2005-06	2005-06	2006-07	2005-06	2006-07	2005-06	2006-07
cash receipts	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
potatoes	164 660	185 640	140 290	107 890	0	0	0	0	140 530	133 668	140 530	133 668
pumpkins	1 880	1 130	0	0	0	0	43 670	17 850	3 965	4 105	3 965	4 105
green peas	110	70	7 650	3 100	0	0	0	0	5 122	6 603	5 122	6 603
beans	420	910	11 210	4 940	0	0	0	0	7 743	5 682	7 743	5 682
tomatoes	39 430	42 330	5 410	5 830	0	0	0	0	100 120	109 108	100 120	109 108
onions	38 060	57 600	20 890	19 930	0	0	0	0	27 760	29 023	27 760	29 023
carrots	83 030	80 800	10 070	8 390	0	0	0	0	23 523	24 568	23 523	24 568
cauliflowers	14 070	17 180	7 900	7 030	0	0	0	0	14 701	15 025	14 701	15 025
other vegetables	49 050	54 320	15 320	20 940	0	0	49 090	113 870	98 922	93 414	98 922	93 414
unspecified	48 460	54 030	2 170	1 620	na	na	0	0	130 385	140 714	130 385	140 714
other cash receipts	56 010	na	69 060	na	na	na	410 550	na	85 399	na	85 399	na
total cash receipts	495 180	na	289 970	na	na	na	503 330	na	638 170	na	638 170	na

na Not available.

table A2 cash costs – vegetable growers, by state, 2005-06  
average per farm

	New South Wales		Victoria	Queensland		South Australia		Western Australia		Tasmania		Northern Territory		Australia	
	\$	\$		\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
hired labour	85 920		158 670	139 650	73 500	49 140	28 100	73 220	102 270						
produce purchased	2 060		5 270	13 730	3 630	0	0	0	5 340						
fertiliser	35 960		52 690	34 100	29 180	45 040	34 630	61 600	39 180						
seed	20 280		37 240	42 960	38 120	18 220	28 360	31 280	32 310						
crop and pasture chemicals	13 430		27 310	39 250	30 080	19 520	24 080	13 060	26 390						
fuel, oil and grease	30 490		44 370	26 640	32 170	23 310	20 200	23 990	30 530						
electricity	4 870		11 290	10 640	6 970	7 790	11 980	4 600	8 990						
packing materials	22 210		29 710	61 120	25 280	20 680	380	42 670	31 300						
repairs															
- buildings and structures	9 220		21 630	15 740	5 930	1 410	9 850	2 490	12 310						
- motor vehicles and plant	15 160		22 300	34 730	22 420	20 970	16 870	15 830	23 050						
contracts paid	11 680		49 890	74 940	17 790	3 940	36 900	11 880	38 390						
lease payments	4 030		1 610	14 900	8 390	580	0	0	5 870						
packing charges	23 620		40 880	19 850	220	2 060	0	0	18 480						
administration	6 100		12 400	20 030	7 090	6 520	8 670	6 030	11 340						
insurance	5 750		8 310	5 070	3 650	6 980	6 180	2 390	5 990						
motor vehicle expenses	4 850		7 170	4 970	4 280	1 520	1 870	3 280	4 600						
plant hire	3 900		2 610	3 990	6 280	1 820	1 690	6 080	3 490						
rates	4 080		12 730	3 740	6 000	5 000	3 910	500	5 980						
interest paid	9 550		23 360	23 500	21 290	16 290	24 990	9 510	19 640						
land rent	3 760		5 400	9 700	11 260	6 090	8 080	0	7 080						
other cash costs	42 890		66 580	82 010	43 380	24 000	17 880	33 810	52 680						
total cash costs	359 810		641 420	681 260	396 910	280 880	284 620	342 220	485 210						

table A3 financial performance – vegetable growers, by state, 2005-06  
average per farm

	New South Wales		Victoria	Queensland	South Australia	Western Australia	Tasmania	Northern Territory	Australia
	\$	%	\$	\$	\$	\$	\$	\$	\$
total cash receipts	499 030	21	878 270	843 280	512 630	495 180	289 970	503 330	638 170
total cash costs	359 810		641 420	681 260	396 910	280 880	284 620	342 220	485 210
<b>farm cash income</b>	<b>139 210</b>		<b>236 850</b>	<b>162 020</b>	<b>115 720</b>	<b>214 300</b>	<b>5350</b>	<b>161 110</b>	<b>152 960</b>
proportion of farms with negative farm cash income		21	13	25	29	12	46	43	24
buildup in trading stocks	1 490		-390	7 050	-170	0	340	0	2 030
depreciation	31 470		49 330	40 810	27 310	29 040	34 320	18 620	36 950
operator and family labour	55 470		49 380	57 120	43 570	54 290	44 310	36 920	51 620
<b>farm business profit</b>	<b>53 760</b>		<b>137 740</b>	<b>71 140</b>	<b>44 670</b>	<b>130 970</b>	<b>-72 930</b>	<b>105 570</b>	<b>66 410</b>
<b>profit at full equity</b>									
- excl. capital appreciation	69 530		165 210	108 730	82 460	153 340	-40 020	115 080	95 030
- incl. capital appreciation	131 790		272 910	327 120	134 010	884 707	56 470	214 960	270 010
age of operator/manager/years	51		49	54	50	51	53	44	51
<b>rate of return</b>									
- excl. capital appreciation%	2.5		5.0	3.2	4.2	4.6	-1.7	7.5	3.2
- incl. capital appreciation%	4.8		8.3	9.8	6.7	15.0	2.3	13.9	9.2
change in farm debt during the year									
\$	-3 550		-32 330	12 040	10 530	13 830	-24 760	76 510	-2 400
total farm debt at 30 june	68 550		284 160	310 880	167 640	213 290	276 840	290 050	224 950
total farm capital at 30 june	2 872 190		3 451 910	3 567 920	2 084 290	3 570 610	2 541 110	1 644 510	3 084 000
farm equity ratio	%	82	63	62	66	91	84	82	72
debt servicing ratio	%	2	3	3	4	3	9	2	3

table A4 area of vegetables sown and harvested – vegetable growers, by state  
average per farm

	New South Wales		Victoria		Queensland		South Australia		Western Australia		Tasmania		Northern Territory	
	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006
	ha	ha	ha	ha	ha	ha	ha	ha	ha	ha	ha	ha	ha	ha
<b>area of vegetables sown</b>														
potatoes	10	7	16	16	9	8	17	17	9	9	12	11	0	0
pumpkins	1	1	0	0	2	2	0	0	0	0	0	0	2	1
green peas	1	0	1	1	0	0	0	0	0	0	5	2	0	0
beans	1	1	2	1	1	1	0	0	0	0	4	2	0	0
tomatoes	5	2	9	6	3	2	0	0	0	0	0	0	0	0
onions	1	1	1	1	1	2	4	4	1	1	3	3	0	0
carrots	0	0	0	0	2	2	0	0	3	3	2	1	0	0
cauliflowers	4	4	0	0	0	0	0	0	1	1	5	1	0	0
other vegetables	19	19	1	0	7	6	2	2	2	2	1	1	4	2
unspecified	4	4	24	25	4	4	3	3	2	3	0	0	0	0
<b>area of vegetables harvested</b>														
potatoes	10	7	15	15	8	8	17	17	9	9	12	10	0	0
pumpkins	1	1	0	0	2	2	0	0	0	0	0	0	2	1
green peas	1	0	1	1	0	0	0	0	0	0	5	2	0	0
beans	1	1	1	1	1	1	0	0	0	0	4	1	0	0
tomatoes	5	2	9	6	3	2	0	0	0	0	0	0	0	0
onions	1	1	1	1	1	2	4	4	1	1	3	2	0	0
carrots	0	0	0	0	2	2	0	0	3	3	2	1	0	0
cauliflowers	4	4	0	0	0	0	0	0	1	1	1	1	0	0
other vegetables	18	15	1	0	6	6	1	1	2	2	1	1	4	2
unspecified	3	4	23	24	4	6	3	3	2	3	0	0	0	0

table A5 vegetable production – vegetable growers, by state

	New South Wales		Victoria		Queensland		South Australia		Western Australia		Tasmania		Northern Territory	
	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006
	-06	-07	-06	-07	-06	-07	-06	-07	-06	-07	-06	-07	-06	-07
quantity produced	†	†	†	†	†	†	†	†	†	†	†	†	†	†
potatoes	261	194	559	457	251	274	685	673	470	478	671	591	0	0
pumpkins	26	20	0	1	21	25	1	4	5	2	0	0	36	15
green peas	10	6	4	4	1	1	0	0	0	0	20	9	0	0
beans	2	2	6	6	5	3	0	0	0	0	29	8	0	0
tomatoes	302	173	873	585	151	142	4	4	24	21	2	2	0	0
onions	46	36	19	16	57	77	215	198	84	87	196	174	0	0
carrots	0	0	0	0	53	46	0	0	208	222	119	105	0	0
cauliflowers	28	30	43	49	11	10	4	5	18	14	26	17	0	0
other vegetables	182	173	6	4	212	199	28	28	49	50	16	12	55	76
unspecified	92	117	609	1 166	131	126	44	46	42	42	11	7	0	0

average per farm

table A6 quantity of vegetables sold – vegetables growers, by state

quantity sold	New South Wales		Victoria		Queensland		South Australia		Western Australia		Tasmania		Northern Territory	
	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006
	-06	-07	-06	-07	-06	-07	-06	-07	-06	-07	-06	-07	-06	-07
	†	†	†	†	†	†	†	†	†	†	†	†	†	†
potatoes	251	189	589	472	258	274	658	648	398	438	603	551	0	0
pumpkins	26	20	0	1	21	23	1	4	5	2	0	0	36	15
green peas	10	6	4	4	1	1	0	0	0	0	20	9	0	0
beans	2	2	6	6	5	3	0	0	0	0	29	8	0	0
tomatoes	303	175	873	585	152	142	4	4	24	23	2	2	0	0
onions	46	35	19	16	57	77	215	198	74	88	163	152	0	0
carrots	0	0	0	0	51	46	0	0	218	223	102	91	0	0
cauliflowers	28	30	43	49	9	8	4	5	18	14	26	17	0	0
other vegetables	213	172	6	4	211	198	36	34	49	50	16	10	55	76
unspecified	87	113	603	1 161	129	127	46	47	41	42	10	7	0	0

average per farm

table A7 area irrigated and irrigated vegetable production – vegetables growers, by state, 2005-06  
average per farm

		New South Wales		Victoria	Queensland	South Australia	Western Australia	Tasmania	Northern Territory	Australia
<b>area irrigated</b>										
potatoes	ha	11	17	10	17	8	13	0	13	
pumpkins	ha	1	0	2	0	0	0	2	1	
green peas	ha	1	0	0	0	0	5	0	1	
beans	ha	1	2	1	0	0	3	0	1	
tomatoes	ha	6	10	3	0	0	0	0	4	
onions	ha	1	1	1	4	1	3	0	2	
carrots	ha	0	0	2	0	3	2	0	1	
cauliflowers	ha	4	0	0	0	1	5	0	2	
other vegetables	ha	21	1	7	2	2	1	4	7	
unspecified vegetables	ha	4	25	4	3	2	0	0	7	
<b>production</b>										
potatoes	t	296	609	261	685	425	685	0	453	
pumpkins	t	29	0	21	1	5	0	36	12	
green peas	t	11	1	1	0	0	19	0	5	
beans	t	2	7	5	0	0	26	0	6	
tomatoes	t	343	951	163	4	25	2	0	302	
onions	t	52	21	61	215	88	193	0	88	
carrots	t	0	0	57	0	219	122	0	50	
cauliflowers	t	32	47	12	4	19	27	0	24	
other vegetables	t	196	6	228	28	52	16	55	108	
unspecified vegetables	t	104	657	141	44	45	11	0	198	

table A8 volume of irrigation water applied, vegetable growers, by state, 2005-06  
average per farm irrigating

	New South Wales		Victoria		Queensland		South Australia		Western Australia		Tasmania		Northern Territory		Australia		
	ML	ML	ML	ML	ML	ML	ML	ML	ML	ML	ML	ML	ML	ML	applied ML	rate ML/ha	crop yield t/ha
potatoes	61	62	28	108	58	48	0	0	0	0	0	0	0	0	56	4	36
pumpkins	7	0	3	1	3	0	8	0	8	0	0	0	0	0	3	3	15
green peas	0	0	0	0	0	7	0	0	0	0	0	0	0	1	1	1	6
beans	0	4	2	0	0	7	0	0	0	0	0	0	0	2	2	2	5
tomatoes	36	58	11	1	4	0	0	0	4	0	0	0	0	22	6	6	79
onions	5	3	4	23	7	8	0	0	7	8	0	0	0	7	4	4	53
carrots	0	0	3	0	21	5	0	0	0	5	0	0	0	3	3	3	48
cauliflowers	1	1	1	0	10	3	0	0	0	3	0	0	0	2	2	1	15
other vegetables	31	3	20	6	6	2	14	0	6	2	2	14	0	14	14	2	16
unspecified vegetables	25	48	13	18	15	1	0	0	15	1	1	0	0	21	3	3	27
total	166	179	85	157	124	81	22	22	124	81	22	22	22	131	29	29	300

## survey method and definitions

### *target populations*

ABARE surveys are designed and samples selected on the basis of a framework drawn from the Australian Business Register maintained by the Australian Bureau of Statistics (ABS). This framework is a list of 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 \$40 000 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 vegetable growing industry*

The vegetable growing industry definition is based on the Australian and New Zealand Standard Industrial Classification 2006 (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 vegetable 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 0122 and 0123. This class consists of units mainly engaged in growing vegetables, with primary activities including capsicums, cucumbers, herbs, lettuces, sprouts, tomatoes, asparagus, beans, carrots, garlic, kumara, melons, onions, peas, potatoes, sugar beet, sweetcorn, and truffles.

### *survey design and sample weighting*

The population was stratified by operation size using the estimated value of agricultural operation (EVAO). The size of each stratum was determined using the Dalenius-Hodges method (Lehtonen 2004). The sample allocation to each

stratum was done using a mixture of the Neyman allocation, which takes into account the variability within strata of the auxiliary variable, in this case EVAO, and proportional allocation, which only considers the population 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 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 small weights and smaller farms have larger weights, reflecting the strategy of sampling a higher fraction of the larger farms than of small 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.

## *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 were provided by the owner manager of surveyed businesses and included 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 was 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 was 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 like 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**

Is 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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Dairy Australia  
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Fisheries Resources Research Fund  
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Grains Research and Development Corporation  
Grape and Wine Research and Development Corporation  
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