



**wine grape growing farms
in the Riverland, South Australia**
financial performance of farms, 2005-06



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foreword

The Australian wine industry has been facing the challenge of maintaining profitability in a global market environment of relatively flat demand, increasing supply and declining prices. Understanding the physical, financial and environmental characteristics of wine grape growing farms as well as the management practices of farmers is important for strategic planning.

This report profiles wine grape growers in the Riverland region of South Australia and is the first in a new series of ABARE reports commissioned by the Grape and Wine Research and Development Corporation (GWRDC) for the period 2005-06 to 2007-08. The objective in these studies is to identify the distinguishing characteristics of farms of varying sizes in terms of management, production and financial practices that are likely to be critical for the long term viability of these farms.

This report contains detailed physical, financial, socioeconomic and environmental data collected from wine grape growers in the Riverland region. Growers in this region were surveyed to provide a snapshot of farm performance for the 2005-06 financial year, prior to the recent drought. ABARE and GWRDC are confident that the information in this report and future analyses of other key wine grape growing regions will provide an insight into the production and management issues faced by wine grape growers.



Phillip Glyde
Executive Director
ABARE
September 2007



Dr John Harvey
Executive Director
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acknowledgments

This report draws on data collected from a survey of wine grape producers in the Riverland region of South 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 authors wish to thank the farmers and accountants who participated in this survey. Without their assistance, the survey would not have been possible.

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summary

- » Between October and December 2006, ABARE conducted a survey of wine grape growers in the Riverland region of South Australia that was funded by the Grape and Wine Research and Development Corporation. Detailed information on the physical and financial characteristics of wine grape growing farms as well as management practices of producers were collected as part of this survey covering the 2005-06 wine grape growing season.

the Riverland region

- » The Riverland region of South Australia is a well established grape producing region located 250 kilometres north east of Adelaide. It extends for 330 kilometres along the Murray River from Paringa to Blanchetown. It is a warm climate wine grape growing region and is the largest wine producing region in Australia. Just over half of South Australia's crushed wine grapes were from the Riverland region in 2005, equating to a quarter of Australia's production in that year.
- » In 2005-06, the region had an estimated 1275 wine grape growing farms with an estimated value of agricultural operations (EVAO) greater than \$40 000. On average, each farm operated 39 hectares, of which around 17 hectares were planted to wine grapes.
- » The region is composed mainly of medium to small size farms. Over 75 per cent of farms had less than 20 hectares planted to wine grapes. However, around 66 per cent of the total wine grapes produced in the region in 2005-06 came from large farms (farms with more than 20 hectares of grape vines). The middle group (10-20 hectares) accounted for 20 per cent of total wine grape production and the small farms (under 10 hectares) accounted for 14 per cent.

financial performance

receipts

- » Total cash receipts for wine grape growing farms in the Riverland region averaged \$175 000 in 2005-06. On average, wine grape receipts accounted for 56 per cent of all farm receipts. Large farms averaged total cash receipts of \$451 000, middle size farms \$159 000 and small farms \$49 800.

costs

- » The largest cost items were interest payments, hired labour, repairs and maintenance, contracts, chemicals and fertilisers. Excluding 'other costs', interest payments accounted for the highest proportion of farm costs.

farm cash income and business profit

- » Large, medium and small farms generated farm cash income (receipts minus costs) averaging around \$222 000, \$46 100 and \$9600 respectively in 2005-06. Grape growers in the large farm category generated a sufficiently large cash surplus to record a farm business profit, on average, of \$139 000. (Farm business profit is a measure of farm cash income plus changes in trading stocks minus depreciation and imputed labour costs.) Medium size farms, on average, had a business loss of \$4200, whereas small farms, on average, had a loss of \$14 300.

farm financial performance, by size

- » Results from the survey revealed significant differences in rates of return to all capital used (excluding capital appreciation) between the three farm size groups. The scale of operation was the principal factor that influenced the level of farm cash income, and hence rates of return, earned by wine grape growing farms in the region. Large farms on average had rates of return of 4.8 per cent, medium farms 0.9 per cent and small farms had a negative rate of return of 1.2 per cent.
- » Although large farms had relatively lower costs and receipts per hectare than medium and small farms, they had much higher rates of return (excluding capital appreciation).

irrigation management

- » Reflecting the relatively dry climate of the Riverland region, wine grape producers rely heavily on irrigation. Over 90 per cent of producers in the Riverland region irrigated their farms in 2005-06. The most common methods used were low sprinklers and trickle or drip systems. Each of these irrigation methods was used by 45 per cent of producers. Most wine grape growers irrigated at night to avoid evaporation and varied the irrigation to suit weather conditions. Soil profile samplers and capacitance probes were the most common tools used for irrigation scheduling.

environmental issues

- » Around 12 per cent of wine grape producers in the Riverland region indicated that salinity was a significant environmental problem on their property in 2005-06. As part of normal farm management, almost 70 per cent of producers in the region undertook soil and plant tissue tests to determine fertiliser requirements, while a quarter of producers regularly monitored the quality of their irrigation water. While chemicals are important for maintaining the optimal condition of vines and fruit, more than 80 per cent of growers indicated that they were attempting to reduce chemical use.

farmer intentions

- » More than 50 per cent of wine grape producers in the Riverland region indicated that they did not expect to alter the level of involvement in their farming enterprise within the next five years. Only 6 per cent of wine grape producers planned to increase their level of involvement in their current farming enterprise within the next five years.
- » Around 27 per cent of wine grape producers in the Riverland region indicated that irrigation infrastructure was an impediment to farm expansion and more than 30 per cent of producers planned to invest in irrigation infrastructure within the next five years.

introduction

Remaining viable in an uncertain economic and climatic environment is a major challenge facing wine grape producers in the Riverland region of South Australia. In recent years the wine grape industry has faced weaker prices, market access issues and changes to the management of water resources. Of most concern to producers has been declining farmgate prices for wine grapes, which has affected incomes of individual growers. Between 2004-05 and 2005-06, prices for white wine grapes fell by 26 per cent and for red wine grapes by 12 per cent in warm climate regions (which includes the Riverland region) (Fletcher et al. 2007). Additionally, availability of irrigation water is now a crucial issue facing many wine grape growers.

This report profiles wine grape growers in the Riverland region in 2005-06 and is the first in a new series of ABARE reports commissioned by the Grape and Wine Research and Development Corporation (GWRDC) for the period 2005-06 to 2007-08. The objective in these studies is to identify the distinguishing characteristics – production, financial and management practices – of farms of varying sizes that are likely to be critical for the long term viability of these farms.

The studies will provide additional information to the wine grape industry on which to base assessments of strategic research and development decisions critical for future productivity growth and long term competitiveness of the Australian wine industry. The information will also contribute to GWRDC's market intelligence program.

This report contains detailed physical, financial, socioeconomic and environmental characteristics of wine grape farms in the Riverland region in 2005-06. The report also contains information on management practices used by wine grape growers in this region. The survey was conducted between October and December 2006 and involved face to face interviews with sixty wine grape growers in the region. It covered the 2005-06 wine grape growing season. Similar studies recently conducted on the Mildura-Wentworth region by ABARE include Oliver et al. (2006) on the McLaren Vale and Riverina regions and Mues and Boero-Rodriguez (2007) on the Mildura-Wentworth regions.

2

Riverland region

The Riverland region of South Australia is a well established warm climate grape producing region located 250 kilometres north east of Adelaide. It extends for 330 kilometres along the Murray River from Paringa to Blanchetown. The region has an elevation of between 50 and 150 metres above sea level. For the purpose of this analysis, the Riverland region is composed of the following ten statistical local areas: Berri, Barmera, Loxton Waikerie - East and West, Mid Murray, Renmark, Paringa, Murray Bridge, Karoonda East Murray and Southern Mallee (map 1).

Over 21 000 hectares were devoted to vineyards in 2005-06, and there were more than 1300 wine grape growers in the region in 2005-06 (RWIDC 2005). The Riverland wine industry is characterised by a large number of small to medium size independent vineyards, with a small number of large scale wine producers.

map 1 **Riverland region**



table 1 wine grape proportion of production, 2005-06

Riverland region

			proportion of			
			Riverland	South Australian production	Australian warm climate production	Australian production
			tonnes	%	%	%
premium	red	cabernet franc	223	14	23	7
		cabernet sauvignon	66 972	39	42	22
		malbec	621	31	73	19
		merlot	29 769	48	38	23
		petit verdot	14 726	84	67	58
		pinot noir	5 735	34	52	17
		ruby cabernet	9 742	95	37	35
		shiraz	104 738	41	44	24
		total red	232 530	44	43	24
	white	chardonnay	111 377	65	35	26
		chenin blanc	4 584	85	65	40
		colombard	34 564	98	44	44
		muscadelle (tokay)	299	58	80	29
		pinot gris	11	<1	<1	<1
		riesling	4 001	14	35	10
		sauvignon blanc	5 828	33	37	14
		semillon	11 671	45	17	11
traminer		2 888	71	34	27	
verdelho		3 037	64	28	15	
	total white	178 264	60	34	24	
nonpremium	red	grenache	9 172	43	84	40
		mataro (mourvedre)	6 521	74	77	59
		total	15 693	52	81	46
	white	crouchen	177	87	9	9
		doradillo	1 751	99	97	95
		palomino	494	77	93	71
		trebbiano	142	82	4	3
	total	2 565	92	31	30	
multipurpose	red	total	17	100	100	100
	white	total	27 990	100	36	36
minor varieties	red	total	3 268	63	18	13
	white	total	4 132	57	38	27
all wine grapes	red	total	251 509	44	44	25
	white	total	212 953	64	34	25
		total	464 463	51	39	25

Source: Fletcher et al. 2007

The Riverland is the largest wine producing region in Australia. Around half of South Australia's crushed wine grapes in 2005 were from the Riverland. This equates to a quarter of Australia's total crushed wine grapes. Around 64 per cent of South Australia's white wine grapes and 44 per cent of its red wine grapes came from the Riverland region in 2005-06.

wine grape production in 2005-06

The 2005-06 growing season in the Riverland region started with a wet spring. For the rest of the growing season the weather was dry and consequently there were few bunch rot and mildew problems (PGIBSA 2006). The growing season was also relatively cool, without periods of extreme heat, which helped growers to produce good quality wine grapes. However, around 10 per cent of wine grapes were not harvested across the region because of the oversupply of wine grapes in that year (PGIBSA 2006).

In 2005-06 the region produced the majority of South Australia's petit verdot and ruby cabernet (premium red wine grape varieties). The region also produced the majority of South Australia's chardonnay, chenin blanc, colombard, muscadelle (tokay), traminer, verdelho (premium white wine grape varieties) and the majority of the nonpremium varieties except grenache (table 1).

The region is also well known for its production of citrus, stonefruit, vegetables and almonds and is a major producer of olives, apples and cherries (RWIDC 2005).

wine grape prices in 2005-06

In 2005-06 the Australian wine industry as a whole was facing the challenge of maintaining profitability in a global market environment of relatively flat demand, increasing supply and declining prices (Sheales et al. 2006). Based on ABARE estimates, wine grape prices averaged \$380 a tonne in 2005-06 in warm climate regions, and \$1000 a tonne in cool climate regions across Australia, with little difference in the average prices of red and white grapes (Fletcher et al. 2007). Prices for wine grapes from the Lower Murray region (composed mainly of the Riverland region) averaged around \$380 in 2005-06 (table 2).

table 2 wine grape prices, 2005-06

	Lower Murray \$/t	warm climate regions of Australia \$/t
red		
cabernet franc	311	290
cabernet sauvignon	324	351
malbec	289	308
merlot	377	384
petit verdot	315	318
pinot noir	495	476
ruby cabernet	264	291
shiraz	425	411
all red grapes	377	381
white		
chardonnay	421	411
chenin blanc	290	319
colombard	279	289
muscadelle (tokay)	333	366
pinot gris	498	694
riesling	380	365
sauvignon blanc	553	512
semillon	361	359
traminer	531	430
verdelho	375	334
all white grapes	391	385
all wine grapes	383	383

Sources: ABS (2007); AWBC (2007).

3

results from the 2006 survey

The survey included only wine grape growing farms with an estimated value of agricultural operations (EVAO) greater than \$40 000. This threshold excluded noncommercial wine grape growing farms.

farm physical characteristics

Based on the 2005-06 ABARE survey, the Riverland region had approximately 1275 wine grape growing farms with an EVAO greater than \$40 000. On average, each farm operated 39 hectares in 2005-06, of which around 17 hectares were planted to wine grapes. Around 0.8 hectares of the area planted to wine grapes had nonbearing vines. Nonwine grapes on average occupied 0.6 hectares and citrus trees 1.4 hectares per farm (table 3). The average number of hectares planted to grapes in 2005-06 was similar to that in 2001-02 (Spencer and Ashton 2003).

As the region is composed of many small and medium size farms, the results are reported for the whole region and for three size groups based on the area planted to wine grapes in 2005-06. The 'small' group is composed of wine grape growing farms that had less than 10 hectares planted to wine grapes, the 'middle' group 10-20 hectares and the 'large' group 20 hectares or more. Of the farms, 51 per cent were small, 25 per cent were in the middle group and 24 per cent were large.

In the region, around 66 per cent of the total wine grapes were produced by the large farms. The middle group accounted for 20 per cent of wine grape production and the small farms accounted for 14 per cent of the total wine grapes. On average, large and medium farms produced a relatively balanced combination of red and white wine grape varieties, whereas small sized farms focused more on red wine grape varieties. Wine grape yield averaged around 23 tonnes per hectare.

Being a warm climate region, the Riverland region relies heavily on irrigation water from the Murray River. The average application rate for wine grapes across the whole region was 6.1 megalitres per hectare per farm. Small farms, on average, had the highest water application rates and medium size farms the lowest. Across all farms, less water was applied to red wine grape vines than white wine grape vines (table 3).

table 3 wine grape growers – key physical characteristics, by size of operation, 2005-06 Riverland region, average per farm

		all farms		large ^a		medium ^a		small ^a	
estimated population	no.	1 275		310		321		644	
total area operated	ha	38.7	(19)	118.7	(25)	24.3	(10)	7.5	(9)
wine grape areas									
red grapes bearing	ha	9.9	(13)	25.9	(20)	7.7	(12)	3.3	(9)
red grapes nonbearing	ha	0.3	(46)	0.8	(62)	0.3	(50)	0.0	(93)
total red grapes	ha	10.2	(13)	26.7	(19)	8.0	(11)	3.3	(8)
white grapes bearing	ha	6.8	(12)	18.4	(18)	5.7	(12)	1.7	(19)
white grapes nonbearing	ha	0.5	(36)	1.7	(41)	0.2	(63)	0.0	(100)
total white grapes	ha	7.2	(12)	20.1	(17)	5.9	(13)	1.7	(19)
total wine grapes bearing	ha	16.7	(9)	44.3	(14)	13.4	(6)	5.0	(9)
total wine grapes nonbearing	ha	0.8	(28)	2.5	(35)	0.5	(35)	0.1	(68)
total wine grapes	ha	17.4	(9)	46.8	(14)	13.9	(6)	5.1	(8)
other grape areas									
bearing	ha	0.6	(32)	1.1	(58)	0.9	(43)	0.2	(58)
nonbearing	ha	0.0	(100)	0.0	-	0.0	-	0.0	(100)
total	ha	0.6	(32)	1.1	(58)	0.9	(43)	0.2	(57)
citrus									
bearing	ha	1.3	(33)	1.6	(54)	3.5	(41)	0.0	(95)
nonbearing	ha	0.1	(64)	0.0	(97)	0.2	(99)	0.1	(85)
total	ha	1.4	(33)	1.6	(54)	3.7	(44)	0.1	(69)
total trees and vine areas									
bearing	ha	18.8	(9)	47.1	(14)	18.1	(10)	5.5	(10)
nonbearing	ha	0.9	(27)	2.6	(35)	0.7	(44)	0.2	(61)
total	ha	19.7	(9)	49.7	(14)	18.8	(11)	5.8	(9)
production									
red grape	t	215.0	(15)	575.9	(23)	151.7	(11)	73.0	(11)
white grape	t	170.1	(13)	469.5	(19)	154.8	(15)	33.8	(17)
total wine grape	t	385.1	(11)	1045.4	(16)	306.5	(9)	106.8	(9)
other grape	t	16.2	(35)	27.1	(61)	27.9	(50)	5.0	(68)
yield									
red wine grapes	t/ha	21.7	(5)	22.2	(6)	19.6	(7)	22.2	(8)
white wine grapes	t/ha	25.1	(4)	25.5	(5)	27.3	(8)	19.7	(11)
total wine grapes	t/ha	23.1	(4)	23.6	(5)	22.9	(7)	21.4	(7)
other grapes	t/ha	26.2	(11)	24.9	(18)	30.1	(14)	21.6	(28)
irrigation application rate									
red wine grapes	ML/ha	5.9	(7)	6.0	(8)	4.8	(19)	6.6	(11)
white wine grapes	ML/ha	6.5	(5)	6.6	(6)	5.8	(9)	7.5	(14)
total wine grapes	ML/ha	6.1	(5)	6.2	(7)	5.3	(13)	6.9	(11)
other grapes	ML/ha	5.6	(14)	6.5	(14)	5.9	(15)	3.3	(77)

^a Small - total area of wine grapes sown less than 10 hectares, medium - total area of wine grapes sown greater than 10 hectares but less than 20 hectares, large - total area of wine grapes sown greater than 20 hectares.

Note: Figures in parentheses are standard errors, expressed as percentages of the estimates. A guide to interpreting this measure of sample variation is included in the survey methods section. The survey only included grape growing farms with an estimated value of agricultural operation of more than \$40 000.

financial performance

Total cash receipts for grape growing farms in the Riverland region averaged \$175 000 in 2005-06. The average for large farms was \$451 000, \$159 800 for middle size farms and \$49 800 for small farms. Wine grape growing farms in the Riverland region depend heavily on income from wine grapes. On average, wine grape receipts accounted for 56 per cent of all farm receipts, citrus 4 per cent and other grapes 2 per cent. Wine grape receipts for large farms, on average, accounted for 57 per cent of total receipts and the proportions for medium and small farms were 45 per cent and 68 per cent respectively (table 4).

The 'other receipts' category accounts for a large proportion of farm cash receipts. This includes income from farm products and services not elsewhere reported, insurance claims and other rebates, off-farm contracts and an estimated market value for stocks transferred off the survey property to related holdings.

The major cost items were interest payments, hired labour, repairs and maintenance, contracts, and chemicals and fertilisers (table 4). On average, interest payments accounted for around 14 per cent of total cash costs for all wine grape growing farms.

Grape growers, on average, received \$70 300 in farm cash income (total receipts minus total cash costs). They also had positive farm business profit, averaging \$25 400 in 2005-06. Large, medium and small farms generated farm cash income of around \$222 000, \$46 100 and \$9600 respectively in 2005-06. Grape growers in the large size group generated an average farm business profit of \$139 000 per farm, while medium and small farms, on average, had business losses of \$4200 and \$14 300 respectively.

The average farm debt on wine grape growing farms in the region was just over \$291 000 at the end of 2005-06. However, notwithstanding the low prices received for wine grapes in 2005-06, all farm size groups generated sufficient cash surplus, on average, to make their interest payments and record positive farm cash incomes. Large farms on average reported higher farm debt and a lower equity ratio than medium and small farms. Large farms, on average, were able to service their debt because of high cash incomes.

Off-farm income helped to supplement the incomes of wine grape growers in the region. Among the three groups, small farms on average had the highest off-farm income (\$48 200).

table 4 **financial performance of wine grape growing farms, by size of operation, 2005-06** Riverland region, average per farm

	all farms		large ^a		medium ^a		small ^a	
estimated population	no.	1275	310	321	644			
cash receipts								
wine grapes	\$	97 769 (14)	257 732 (21)	71 300 (14)	34 068 (13)			
other grapes	\$	3 590 (44)	5 814 (72)	4 783 (84)	1 925 (69)			
citrus	\$	6 919 (33)	8 571 (49)	17 078 (46)	1 059 (85)			
other crops	\$	2 014 (48)	2 130 (97)	939 (52)	2 494 (65)			
other cash receipts	\$	64 434 (17)	177 123 (24)	64 544 (15)	10 204 (41)			
total cash receipts	\$	174 725 (12)	451 370 (18)	158 644 (11)	49 750 (12)			
cash costs								
hired labour	\$	11 234 (28)	27 526 (40)	12 371 (39)	2 835 (69)			
fertiliser	\$	3 803 (12)	8 864 (19)	4 303 (16)	1 120 (25)			
crop and pasture chemicals	\$	7 128 (23)	19 007 (35)	5 701 (23)	2 130 (20)			
fuel, oil and grease	\$	6 378 (14)	17 064 (21)	5 769 (17)	1 544 (18)			
repairs and maintenance	\$	9 463 (15)	21 938 (24)	8 021 (19)	4 185 (14)			
tree and vine replacement costs	\$	824 (37)	1 252 (76)	2 064 (38)	0 -			
contracts	\$	7 308 (17)	14 292 (30)	9 025 (28)	3 094 (22)			
interest	\$	14 556 (23)	31 343 (38)	13 238 (35)	7 143 (32)			
other costs	\$	43 687 (8)	88 201 (13)	52 011 (13)	18 136 (13)			
total cash costs	\$	104 380 (9)	229 485 (16)	112 503 (13)	40 186 (12)			
farm cash income	\$	70 345 (19)	221 885 (23)	46 141 (26)	9 564 (55)			
<i>plus</i> buildup in trading stocks	\$	-79 (95)	0 -	-314 (95)	0 -			
less depreciation	\$	17 173 (9)	36 295 (17)	18 203 (7)	7 468 (13)			
less imputed family labour	\$	27 697 (7)	46 882 (12)	31 788 (7)	16 433 (14)			
farm business profit	\$	25 396 (49)	138 708 (35)	-4 164 (331)	-14 337 (41)			
profit at full equity	\$	40 742 (31)	169 983 (29)	12 616 (105)	-7 364 (72)			
capital appreciation	\$	-76 863 (52)	-217 233 (71)	-28 739 (174)	-33 381 (36)			
profit at full equity								
- incl. capital appreciation	\$	-36 121 (104)	-47 250 (306)	-16 122 (286)	-40 744 (32)			
total capital value of 30 June	\$	1 455 345 (9)	3 333 463 (15)	1 371 965 (8)	594 038 (10)			
rate of return								
- excl. capital appreciation	%	2.7 (25)	4.8 (17)	0.9 (107)	-1.2 (74)			
- incl. capital appreciation	%	-2.4 (104)	-1.3 (305)	-1.2 (288)	-6.5 (30)			
total farm debt ^b	\$	290 845 (21)	763 172 (31)	193 644 (25)	112 252 (27)			
equity ratio ^b	%	80 (4)	76 (6)	84 (6)	81 (6)			
total liquid assets	\$	89 544 (21)	177 462 (29)	119 527 (37)	32 326 (52)			
off farm income	\$	38 759 (19)	36 521 (36)	22 086 (16)	48 150 (26)			

^a Small - total area of wine grapes sown less than 10 hectares, medium - total area of wine grapes sown greater than 10 hectares but less than 20 hectares, large - total area of wine grapes sown greater than 20 hectares. ^b Only includes farms that provided information on debt.

Note: Figures in parentheses are standard errors, expressed as percentages of the estimates. A guide to interpreting this measure of sample variation is included in appendix A. The survey included only grape growing farms with an estimated value of agricultural operation of more than \$40 000.

Farms across all size groups recorded negative capital appreciation (change in the value of land and improvements) in 2005-06. This mainly reflected the depreciation in the value of grape vines brought about by declining farmgate prices for wine grapes between 2004-05 and 2005-06 (Fletcher et al. 2007).

financial performance, by farm size

Results from the survey show significant differences in rates of return to all capital used (excluding capital appreciation) between the three farm size groups. The large farms, on average, had a rate of return of 4.8 per cent, medium farms 0.9 per cent and small farms a negative rate of return of 1.2 per cent. The observed differences mainly reflect the utilisation of capital and the cost structure of the farm. Large size farms had relatively lower costs per hectare than medium and small farms (table 5).

Small and medium size farms had higher average costs of production per hectare of vines compared with large farms. Hired labour was a large cost for small and medium size farms, reflecting that small and medium scale wine grape vineyards are less suited to mechanised production methods. However, the small and

table 5 **receipt and cost ratios of wine grape growing farms, by size of operation, 2005-06** Riverland region, average per farm

		all farms		large ^a		medium ^a		small ^a	
total area operated	ha	39	(19)	119	(25)	24	(10)	8	(9)
receipts per hectare operated	\$/ha	4 512	(17)	3 803	(22)	6 540	(9)	6 632	(15)
costs per hectare	\$/ha	2 695	(15)	1 933	(20)	4 638	(9)	5 357	(13)
hired labour costs									
- per hectare	\$/ha	290	(30)	232	(43)	510	(35)	378	(67)
- per tonne produced	\$/t	29	(25)	26	(37)	40	(33)	27	(66)
rate of return									
- excl. capital appreciation	%	2.7	(25)	4.8	(17)	0.9	(107)	-1.2	(74)

^a Small - total area of wine grapes sown less than 10 hectares, medium - total area of wine grapes sown greater than 10 hectares but less than 20 hectares, large - total area of wine grapes sown greater than 20 hectares.

Note: Figures in parentheses are standard errors, expressed as percentages of the estimates. A guide to interpreting this measure of sample variation is included in appendix A. The survey included only grape growing farms with an estimated value of agricultural operations of more than \$40 000.

medium size farms also recorded higher average receipts per hectare than large farms, which somewhat mitigated the effect of higher cost structures on farm financial performance.

Notwithstanding this, the margin between receipts and costs per hectare is positively associated with farm size. Also, large farms are able to spread their overhead costs over a larger capital base than medium or small farms. The margin between receipts and costs and the scale of operation are therefore the principal factors that influenced the level of farm cash income, and hence rates of return, earned by grape growing farms in the Riverland region.

4

management practices and environmental issues

irrigation management

Reflecting the relatively dry climate in the Riverland region, wine grape producers rely heavily on irrigation. Over 90 per cent of producers surveyed in the Riverland region used irrigation in 2005-06. On average, 6 megalitres of water per hectare were applied over an average area of around 16 hectares. The most common methods of irrigating wine grapes in the Riverland region were through low sprinklers and trickle or drip systems. Each of these methods was used by 45 per cent of producers. Around 30 per cent of producers used fixed overhead sprinklers. A number of producers used more than one method to irrigate their vines (table 6).

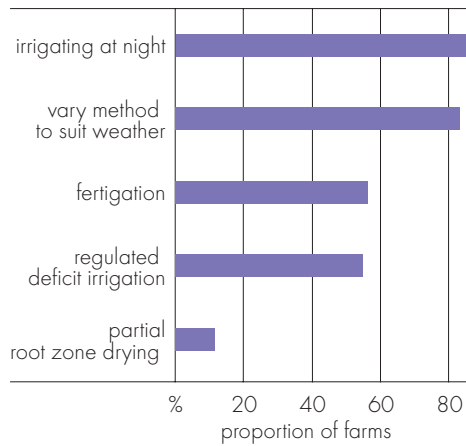
table 6 **irrigation characteristics, 2005-06**

Riverland region, proportion of farms

application methods	%	irrigation management practices	%
wine grape area irrigated using		proportion of farms using	
- flood	3 (69)	- regulated deficit irrigation	55 (13)
- fixed overhead sprinkler	27 (21)	- partial root zone drying	12 (42)
- low sprinkler	45 (16)	- fertigation	56 (12)
- microjet	2 (56)	- irrigating at night	87 (6)
- trickle/drip	45 (14)	- vary method to suit weather	83 (7)
- travelling irrigator	0 (0)	- other	13 (37)
- movable spray lines	0 (0)		
- other	9 (44)		
irrigation scheduling tools		disposal of drainage water	
proportion of farms using		proportion of farms using	
- neutron probes	3 (56)	- regional drainage system	65 (11)
- capacitance probes	34 (18)	- on-farm evaporation systems	2 (99)
- tensiometers	3 (69)	- regional evaporation system	3 (73)
- gypsum blocks	11 (44)	- reuse irrigation water	0 (0)
- time domain reflectometer	2 (99)	- other	5 (73)
- soil profile sampler	59 (12)	area drained by tile drains (ha)	12 (47)
- other	32 (22)		

Note: Figures in parentheses are standard errors, expressed as percentages of the estimates. A guide to interpreting this measure of sample variation is included in appendix A.

fig A **irrigation management practices, Riverland region, 2005-06**



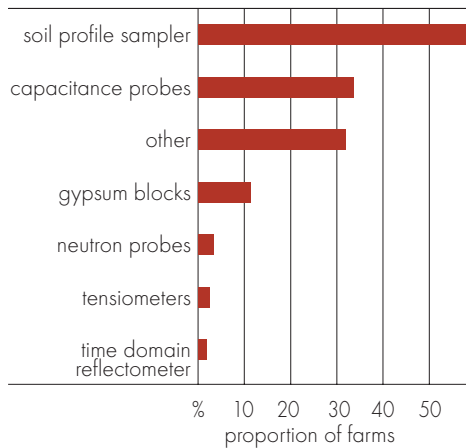
The most common method used to dispose of drainage water was a regional drainage system. On average, 12 hectares per farm were drained by tile drains (table 6).

Most wine grape growers irrigated at night to avoid evaporation, and varied the irrigation method to suit weather conditions (figure A). Other common practices included fertigation and regulated deficit irrigation – that is, withholding water from the vine to control vegetative and reproductive growth.

irrigation scheduling tools

Various irrigation scheduling tools are used by wine grape producers as part of their irrigation management practices (figure B). Irrigation scheduling involves the monitoring of soil moisture and/or plant water use to determine the optimal timing and volume of irrigation water applications.

fig B **producers using irrigation scheduling tools, 2005-06** Riverland region



The tools used tend to vary by soil and irrigation type, cost, and depth of measurement (RWIDC 2005).

Soil profile samplers (digsticks) and capacitance probes were the most common methods used for irrigation scheduling by wine grape producers in the Riverland region in 2005-06. These two tools were used largely because they allow continuous monitoring and greater depth of measurements in areas with well drained sandy soils. More than 30 per cent of producers

used methods other than those suggested in the survey questionnaire, including digging holes and checking test wells.

environmental issues

Around 12 per cent of wine grape producers in the Riverland region indicated that salinity was a significant environmental problem on their property (figure C). Other concerns for producers in the region were falling groundwater levels and loss of soil structure. Other environmental issues were considered to be relatively minor for most of the producers surveyed.

fig C farms reporting environmental problems, 2005-06 Riverland region

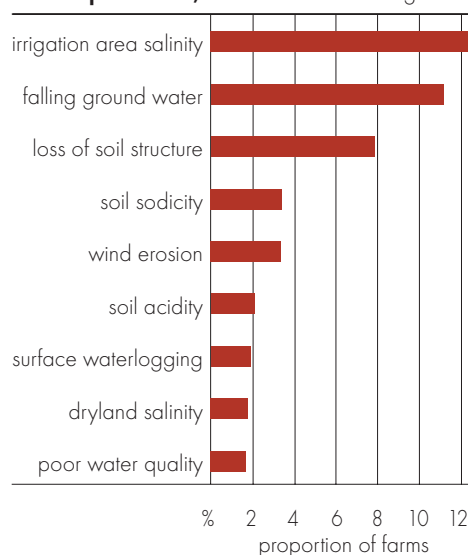


table 7 chemical use on grape growing farms, 2005-06

Riverland region

	%
proportion of farms attempting to reduce chemical use	84 (6)
- percentage reduction achieved	17 (13)
proportion of farms that undertook a chemical course in the past three years	72 (9)
proportion of farms mixing/applying sprays on the following basis:	
- per litre/100 litres	90 (5)
- per hectare	41 (16)
as part of normal farm management program, proportion of farms using	
- tissue or soil tests to determine fertiliser requirements	67 (10)
- irrigation water quality monitoring	24 (24)

Note: Figures in parentheses are standard errors, expressed as percentages of the estimates. A guide to interpreting this measure of sample variation is included in appendix A.

monitoring of environmental issues

table 8 **frequency of monitoring pests and diseases by grape growing farms, 2005-06** Riverland region

proportion of farms monitoring	%	
daily	27	(22)
every 2-7 days	44	(17)
every 1-2 weeks	22	(28)
every 2-3 weeks	3	(72)
every 3-4 weeks	0	(0)
more than 4 weeks	2	(98)

Note: Figures in parentheses are standard errors, expressed as percentages of the estimates. A guide to interpreting this measure of sample variation is included in appendix A.

table 9 **selected socioeconomic characteristics, 2005-06** Riverland region, average per farm

operator			
age	yrs	56	(3)
education:			
- primary school	%	6	(55)
- 1 to 4 years high school	%	45	(16)
- 5 to 6 years high school	%	30	(22)
- trade/technical/vocational	%	4	(73)
- university or other tertiary	%	15	(33)
spouse			
age	yrs	41	(9)
education:			
- primary school	%	4	(70)
- 1 to 4 years high school	%	44	(17)
- 5 to 6 years high school	%	25	(24)
- trade/technical/vocational	%	7	(65)
- university or other tertiary	%	20	(29)

Note: Figures in parentheses are standard errors, expressed as percentages of the estimates. A guide to interpreting this measure of sample variation is included in appendix A.

Almost 70 per cent of producers in the region undertook soil and plant tissue tests to determine fertiliser requirements. A quarter of producers regularly monitored the quality of their irrigation water (table 7).

While chemicals are important for maintaining the optimal condition of vines and fruit, many Riverland growers indicated that they want to reduce the amounts used in their vineyards. More than 80 per cent of growers indicated that they were attempting to reduce chemical use and 72 per cent of growers had undertaken a chemical course in the past three years (table 7).

More than 70 per cent of growers indicated that they monitored for pests and diseases at least once a week (table 8).

socioeconomic characteristics

The average age of producers was 56 years. Around 45 per cent of producers in the region had completed 1-4 years of high school and a further 30 per cent had completed 5-6 years of high school. Around 15 per cent of producers in the Riverland region had completed university or other tertiary education (table 9).

information sources

Wine grape growers' most common source of information on farm management practices was friends and neighbours. Around 88 per cent of wine grape producers in the region sourced information from wineries and 80 per cent sourced information from industry organisations (figure D).

In addition to the varied information sources used by growers in the Riverland region, a large proportion of growers reported that they participated in events to improve their management and technical skills. Field days, conferences and workshops were important sources of further training and development (figure E).

farmer intentions

More than 50 per cent of wine grape producers in the Riverland region indicated that they did not expect their level of involvement in their current farming enterprise to change within the next five years, while only 6 per cent of producers surveyed indicated that they planned to increase their level of involvement in their current farming enterprise within the next five years (figure F).

fig D **sources of information, 2005-06**
Riverland region

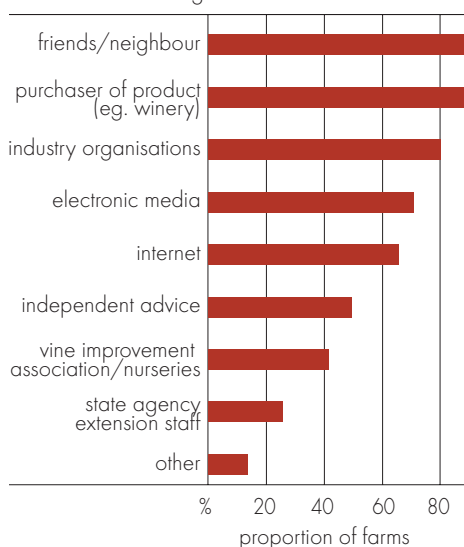


fig E **participation in activities to improve management and technical skills, 2005-06**
Riverland region

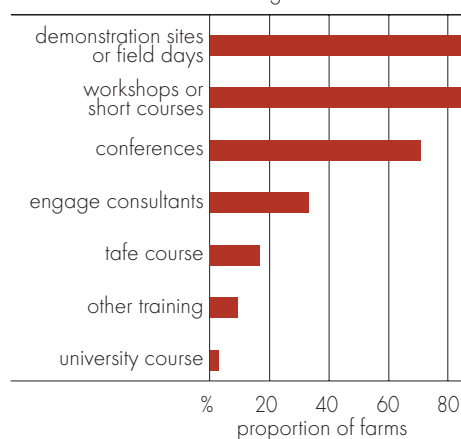
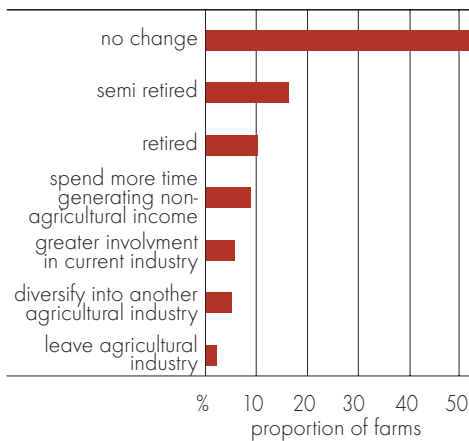


fig F expected level of involvement in current enterprise in 5 years time, 2005-06
Riverland region



More than a quarter of producers indicated that irrigation infrastructure was an impediment to farm expansion (figure G). The majority of these growers operated small farms. Land use planning and labour were also considered to be impediments to farm expansion in the Riverland region.

More than 30 per cent of wine grape producers in the Riverland region planned to invest in irrigation infrastructure within the next five years. Around 25 per cent of producers planned to change their enterprise mix and 27 per cent of producers planned to purchase land in the Riverland region within the next five years (figure H).

fig G impediments to farm expansion, 2005-06
Riverland region

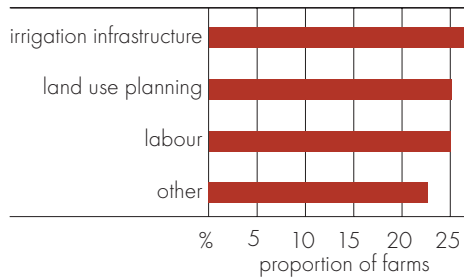
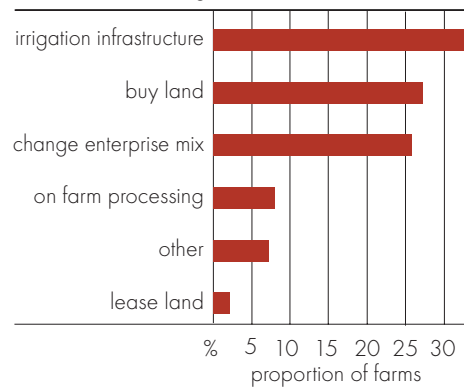


fig H grape producers' plans for capital investment in the next 5 years, 2005-06
Riverland region



expenditure by farm families

Expenditure by farm families in country towns and regional centres is an important source of income for many nonfarm businesses. Service industries such as retail and wholesale trade, transport and storage, finance and machinery repairs benefit from expenditure by farmers. Employment opportunities for town residents and off-farm employment for farmers are also linked to expenditure in country towns.

Expenditure by wine growers in the Riverland region on household items and various farm inputs in a local town, a local regional centre and outside the region are presented in table 10. The results show that local towns and regional centres supplied most of the listed inputs purchased by growers. On average, 61 per cent of total household expenditure of wine grape producers in the Riverland region was spent in the local town and district, while only 24 per cent was spent in the nearby regional centre and district in 2005-06. The remainder (15 per cent) of household expenditure occurred outside the local or regional district. On average, between 42 and 100 per cent of farm expenditure on most inputs took place in a local town and up to 23 per cent in a local regional centre.

table 10 **location of farm expenditure, 2005-06**

Riverland region: total household expenditure was \$32 474 (7)

	local town %	local regional centre %	elsewhere %
household expenditure	61 (9)	24 (21)	15 (15)
fertiliser expenditure	55 (16)	22 (30)	24 (30)
seed expenditure	100 (-)	0 (-)	0 (-)
chemicals expenditure	70 (15)	17 (41)	14 (47)
fuels expenditure	42 (23)	7 (46)	51 (20)
plant hire expenditure	100 (-)	0 (-)	0 (-)
plant repairs and maintenance expenditure	60 (19)	23 (35)	17 (66)
building repairs and maintenance expenditure	79 (11)	19 (43)	2 (90)

Note: Figures in parentheses are standard errors, expressed as percentages of the estimates. A guide to interpreting this measure of sample variation is included in appendix A.

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 \$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 grape growing industry

The grape 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 grape 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 0131. This class consists of units mainly engaged in growing table or wine grapes; or sun drying grapes. Primary activities include, grape growing and sun drying, table grape growing, vineyard operation and wine grape growing.

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 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 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.

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 italics inside parentheses.

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. An example is given below.

The estimates of farm cash income are \$59 334 for grapes growers and \$51 664 for citrus growers – a difference of \$7670 – and the relative standard errors are given as 38 and 42 per cent respectively. The standard error of the difference can be estimated as:

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

Then, it is possible to calculate a 95 per cent confidence interval for the difference as:

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

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 commissions, 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	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

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