Loddon Murray Region Horticulture

Gross Margins 2005-06

Victoria
The Place To Be

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Note:
The booklet was last published as "Horticultural Gross Margins for the Loddon Murray Region 1999–2000" in 1999.

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1. Introduction

Purpose of the publication

This booklet outlines how to calculate and use gross margins for a range of horticultural enterprises. For each enterprise, example gross margins are calculated using typical cost and price information. These examples should not be interpreted as being a true reflection of what will be achieved on an individual property within the region. Rather, they should only be used to assist in calculating gross margins for a specific case, with costs, prices and management assumptions being changed accordingly.

Additional topics covered in the booklet include target pricing, tractor cost guide and calculating the cost of planting plums on different systems. This information has been provided to assist the reader in making farm management decisions.

Treatment of GST

All prices shown in gross margin calculations are exclusive of the Goods and Services Tax (GST). This is because most farmers have an Australian Business Number (ABN) and are registered for GST. In this case, the GST paid on input items will earn tax credits to offset against GST collected on sales for the Australian Tax Office (ATO). GST will therefore have no impact on the gross margin calculation. This assumption will not hold for businesses not registered for GST as they will not receive input tax credits on their purchases. In this case GST should be added back by inflating input prices by 10%. Irrespective of this, the tax implications of farm management decisions should be given consideration when planning changes on the farm.

2005-06 Gross Margin estimates

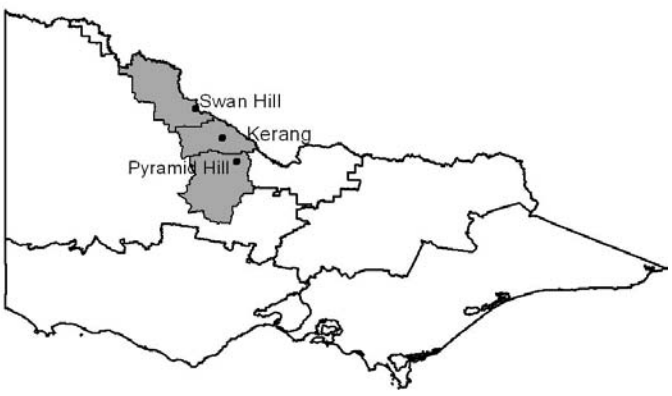
Prices used for the 2005-06 gross margins are based on price forecasts from industry experts. Information from growers, DPI specialists, Goulburn Murray Water and chemical and fertiliser companies has been used to update application rates and prices of inputs.

The gross margin figures are provided in terms of dollars per hectare ($/ha) and dollars per megalitre of irrigation water use ($/ML).

2. Horticulture in the Loddon Murray Region

The area recognised as the Loddon Murray horticultural district covers approximately 5,500 hectares in the Murray Valley of northern Victoria.

Figure 1 Locality guide, Loddon Murray Region



Traditionally a major producer of viticulture products (wine, table and dried), the region has seen significant increases in stonefruit, vegetable and nut production since the mid-1990s.

The Loddon Murray region currently boasts the largest almond and pistachio farms in the Southern Hemisphere, the largest Australian concentration of fresh stonefruit, some of Australia's largest carrot producers and, after Sunraysia, the second largest wine grape production region in Victoria.

The farm value of horticultural produce in the Loddon Murray region reached $99.3million in 2001 (ABS). The farms, packing sheds and wineries employ between 1,500 to 2,000 people on a full-time equivalent basis.

The Loddon Murray region is being recognised as one of the fastest growing horticulture regions in southern Australia and has great potential to expand even further due to favourable climate, soils, water supply, land and progressive growers.

The climate is hot and dry in summer (on average 120-mm rainfall and daily temperatures of 30°C), ensuring few problems with rot and fungal diseases and reducing the need for chemical sprays. Consequently fruit grown in the Loddon Murray region has a long shelf life.

Soil types in the Loddon Murray region consist of sandy loam to clay loam and are favourable for the production of a wide variety of horticultural crops.

The Loddon Murray horticultural industry is well serviced by the local business community, the Department of Primary Industries (DPI) and the shires of Swan Hill Rural City, Gannawarra and Loddon. Established orchards and vineyards are comparatively cheap and have high water security. There are also dryland properties that have potential for horticultural development.

Although the Loddon Murray region offers ideal growing conditions for most horticultural crops, there are many variables that can dramatically affect horticultural returns. Specific and intensive research on market supply and demand are required to run a successful business.

Traditionally, there are four main domestic markets for fresh produce: Melbourne, Sydney, Brisbane and Adelaide. Domestic consumers are increasingly sophisticated, demanding good quality products, with minimal chemical residue and a guarantee of satisfaction.

Export markets are offering new and exciting opportunities for horticulturalists. Asian markets are expanding, and improved transportation means most international markets are accessible. Exporting fruit requires growers to produce a premium product. Quality control is imperative to be a successful grower of exportable produce. Growers need to be aware of both the international consumers' demands and importers' specifications.

As a response to fluctuating prices throughout the season in both domestic and export markets, growers have proven varieties that enter the market place at different times. The emphasis is on quality - premium produce will gain premium prices.

Orchard management and marketing

Growers combine a variety of orchard management practices and marketing options to suit their enterprises. These include:

- employing contractors for thinning and pruning of fruit trees and vines (manual and/ or mechanical pruning);
- selling loose (unpacked) fruit to packing sheds;
- using shrouded controlled droplet applicator for spraying weeds. This system allows spraying around trees and reduces the amount of chemical they would normally use with a conventional spray system;
- packing fruit of different sizes/weights (3.2kg, 5.2kg and 10.2kg); and
- using different packing materials (black trays, cartons)

3. Calculating and Using Gross Margins

Gross margins provide a simple way for comparing the profitability of enterprises that have similar requirements for capital and labour.

A gross margin refers to the total income derived from an enterprise, less the variable costs incurred in the enterprise. To be useful this figure should be expressed in terms of the most limiting resource in the enterprise, such as hectares of land, water use or working capital.

$$\text{Gross Margin} = \frac{\text{Gross Enterprise Income - Enterprise Variable Costs}}{\text{Quantity of Most Limiting Resource (eg land, water)}}$$

For example, the gross margin for packed plums is calculated as follows:

A	Yield	20 tonnes/1,800 trays per ha			
B	Price (net of levy and commission)	$16.05 per tray			
C	Variable cost	$17,758 per hectare			
D	Irrigation water use	6 ML per hectare			
E	Enterprise Income	= **A x B**	= 1800 x $16.05	=	$28,890
F	Gross margin per hectare	= **E – C**	= $28,890- $17,758	=	$11,132
G	Gross margin per ML	= **F/D**	= $11,132/6	=	$1,855

Overhead (fixed) costs are excluded from gross margin calculations. These costs remain constant in the short term regardless of the level of output from the enterprise. Overhead costs include rates, insurance, permanent paid labour, administration and depreciation. The fixed cost of irrigation water is also not included.

Using gross margins

Gross margins are best used when deciding what crop to grow in a particular paddock or season, ie what will give the best return. Or, how much additional money will be earned from growing extra hectares of a particular crop. Also, gross margins can be analysed in collaboration with other farmers to compare how different management practices and timing of operations yield different returns (comparative analysis).

Limitations of gross margins

When gross margins are used as a guide to choosing enterprises, care must be taken where changes in farm plans involve changes in the amounts of capital invested or specialised labour is required. Where changes in capital, labour and other resources are needed, budgeting techniques (such as partial budgeting) are more appropriate than considering gross margins alone. Where changes take place over a number of years, such as planting new fruit varieties, development budgets rather than gross margin analysis would be more appropriate.

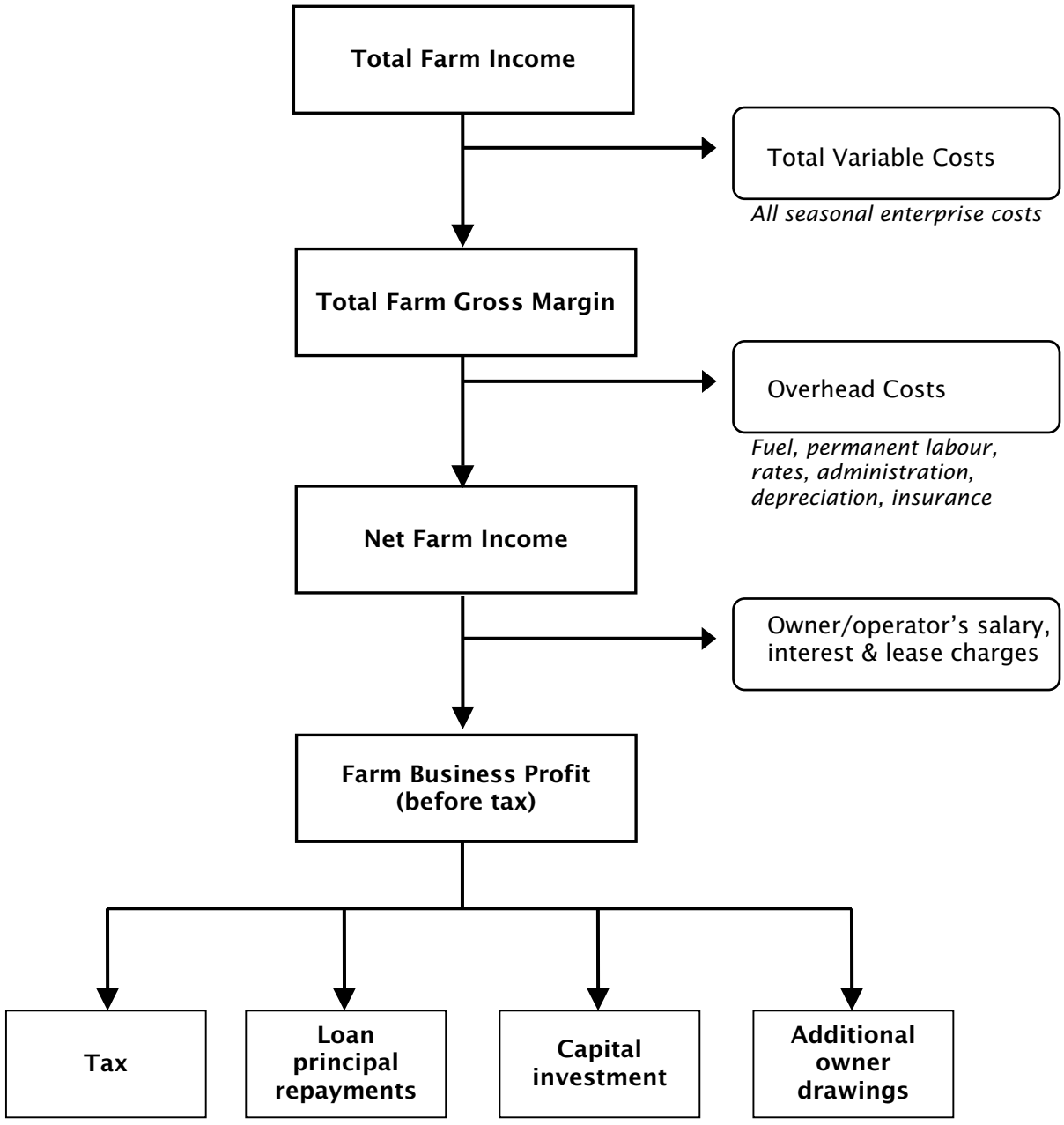
Risk is often difficult to account for when choosing between alternative enterprises. As gross margins are restricted by the information that is available at the time of preparation, examining a range of scenarios for price and yield can be helpful. Other considerations when deciding what to grow (other than gross margins alone) include the agronomic benefits one crop has on a subsequent crop.

Because the gross margin figures in this book are "average" figures, it is important to adjust them to make them applicable to your own farming operation.

How changes in gross margins affect your farm business profit

Gross margins are essentially the first step in deducting business costs from gross income when calculating total farm business profit. Farm business profit (before tax) is arrived at by adding gross margins from all enterprises and taking away overhead costs, interest, lease charges and owner's salary (Figure 2).

Figure 2 How total farm gross margin relates to farm business profit



4. Target Prices - Profitable Prices!

Marketing seems to be the buzzword of the moment but what does it mean for your farming operation in practical terms? Is it knowing the ins and outs of marketing your produce direct to end users or ringing up a winery a couple of days before harvest to see if they are open or a contract is available? Whatever the case, one thing is for sure - everyone is going to need to know more about it in the future.

A sensible marketing plan can benefit your bottom line in the same way as monitoring the trees' growth requirements. A key step in developing a marketing plan is knowing what price will produce a profit for your business. Without this knowledge marketing is based around trying to pick the top of the market, a hard thing to do as we have seen in recent years.

Marketing plans should be a balance between trying to achieve high prices and reducing the risk of receiving low ones. A key step in being able to achieve this balance is actually knowing what the fruit costs to produce and pick, or having a target price. A target price gives you a reference point, allowing you to lock in profits during the year and reduce your business risk. It fills in information gaps not supplied by gross margins, aiding your decision making and thus your business viability.

The calculation

By definition, if sales at the target price lead to a profit for your business then that price must cover all costs of the business, which consist of: commissions and levies, variable costs, overhead costs, reward for management and a margin for profit. Variable costs are used in the calculation of gross margins and include fuel, oil, chemicals, seed and fertiliser. Overhead costs include all other fixed costs of the business (except capital costs) including depreciation on machinery, rates and administration and are present no matter how much it costs to grow the crop. In addition, you must include other costs such as financing costs, living expenses, and a provision for investment so the business can grow.

An example target price calculation is found on page 6. All figures are converted into $/t and $/tray rather than $/ha, as you don't get paid by the hectare do you?

Variable cost per tonne

Converting the variable costs in the gross margin calculations from $/ha to $/t is simply done by dividing the cost per hectare ($/ha) by the expected yield (t/ha). You might have picked up a difficulty in using target prices. How do you know the yield when it isn't in the bin? This is where some guesswork comes into play. As with any plan it is ongoing and needs adjusting along the way. It is essential however, as it allows you to compare prices on offer to the price that will produce profit for the business. If the price on offer is greater than the target price then an opportunity exists to secure a profit for your business. Hence, the target price becomes the focus of marketing decisions over the course of the year.

Overhead cost per tonne

The example includes some fairly typical figures. As overheads are incurred by the business as a whole we need to apportion cost to the horticultural enterprise so it can be incorporated into the target price. Roughly, if fruit production accounts for 60% of your time, land and/or income then we should be trying to cover 60% of the overhead cost from horticultural returns. To apportion costs on a per tonne basis you need to know the total amount of fruit grown on the farm.

In other words, income from fruit production should cover a certain percentage of total overhead costs and profit margins. For example, an orchard with packing shed has a total business overhead cost of $90,000. Fruit production comprises 50% of the total business and the orchard's total crop is estimated at 400 tonnes. The income from fruit production that has to be made to cover overhead costs is 50% of $90,000 = $45,000. This $45,000 has to be made over 400 tonnes, so $113 has to be made on every tonne of fruit to cover overheads.

Profit margin per tonne

The same is done with the margin for profit. These overhead and profit margin figures will be the same for all of your crops, allowing you to work out the target price easily for all of your crops. This is the reason that we have left room for you to complete your own calculations. All businesses will be different so it is important that you go through and work out some rough figures to focus on during the marketing and growing year.

The production year consists of both marketing and growing your crop. You monitor the crop (hopefully!) so why not the markets? Not watching the market for risk management opportunities is like not watching what type of weeds that need to be controlled. Both impact on your bottom line. Go through and do the calculation for yourself; you'll find it useful. If you have any queries contact your local DPI economist or business adviser for information.

Target Price Calculation

Horticultural crop grown:		**Plums**							***Your figure***
			A	**Yield**	**20** t/ha		**10** kg/tray		
				Pack out	**90%**		**1,800** trays/ha		
VARIABLE COSTS								**$/ha**	
Fertiliser		*Urea*	0.217	kg/ha		@	$500 /t	**$100**	*0.217 x $500*	
		Double super	0.125	kg/ha		@	$530 /t	**$66**	*0.125 x $530*	
		Potassium nitrate	0.066	kg/ha	1	@	$1,200 /t	**$79**	*0.066 x 1 x $1200*	
		Zinc	1	l/ha	2	@	$12 /l	**$24**	*1 x 2 x $12*	
Chemicals		*Herbicide*	3	L/ha	1	@	$12.70 /L	**$38**	*3 x 1 x $12.70*	
		Spray seed	3	L/ha	5	@	$11.40 /L	**$171**	*3 x 5 x $11.40*	
		Pesticide					$383 /ha	**$383**	*estimate*	
Labour		*Thinning*	820	trees/ha		@	$2.50 /tree	**$2,050**	*820 x $2.50*	
		Pruning	820	trees/ha		@	$2.50 /tree	**$2,050**	*820 x $2.50*	
		Picking	12.2	hr/t		@	$17.50 /hr	**$4,270**	*12.2 x 20t x $17.50*	
		Packing	1,800	trays/ha		@	$0.92 /tray	**$1,656**	*1,800 x $0.92*	
		Other labour				@	$250 per ha	**$250**	*estimate*	
Shed cost		*Cooling*	1,800	trays/ha		@	$0.26 /carton	**$468**	*1,800 x $0.26*	
		Other shed costs	1,800	trays/ha		@	$0.16 /carton	**$288**	*1,800 x $0.16*	
Freight and packaging			1,800	trays/ha		@	$2.71 /carton	**$4,878**	*1,800 x $2.71*	
Irrigation and drainage		*Water*	6	ML/ha		@	$15 per ML	**$90**	*6 x $15*	
		Drainage	6	ML/ha		@	$15 per ML	**$90**	*6 x $15*	
		Power	6	ML/ha		@	$15 per ML	**$90**	*6 x $15*	
		Other water costs (Appendix B)				@	$286 per ha	**$286**	*estimate*	
Machinery	Slashing		1	hr/ha	4	@	$18.30 /hr	**$73**	*1 x 4 x $18.30*	
	Fertiliser application		0.6	hr/ha	3	@	$18.30 /hr	**$33**	*0.6 x 3 x $18.30*	
	Chemical applications		17	hr/ha		@	$18.30 /hr	**$311**	*17 x $18.30*	
Other	Levy					@	$0.01 per kg	**$180**	*1,800 x 10 x $0.01*	
	Commission	early season value	$19	per tray		@	15% gross value	**$5,130**	*1,800 x $19 x 15%*	
	Fuel and oil						$300 per ha	**$300**	*estimate*	

	B	**TOTAL VARIABLE COSTS/HA**		**$23,354**		
	C	**VARIABLE COSTS/TONNE**	***(B ÷ A)***	**$1,297**	*$23,354 / 20t*	
SCALE OF BUSINESS						
	D	Total fruit production (tonnes)		400	*estimate*	
	E	Fruit production as a proportion of total business		50%	*estimate*	
OVERHEAD COSTS						
Machinery Replacement Allowance (MRA)						
	F	Total clearing sale value of farm machinery		$500,000	*estimate*	
	G	Estimated useful life of machinery (years)		10	*estimate*	
	H	Annual MRA per tonne of fruit	***(F ÷ G) ÷ D***	**$125**	*($500,000 ÷10) ÷ 400t*	
Business overheads						
	I	Total business overheads		$90,000	*estimate*	
	J	Business overheads/t	***(I x E) ÷ D***	**$113**	*$90,000 x 50% ÷ 400*	
	K	**TOTAL OVERHEADS/TONNE**	***(H + J)***	**$238**	*$125 + $113*	
PROFIT MARGIN INCLUDING ANNUAL FINANCE AND LIVING COSTS						
Total debt **$250,000** Interest rate 12%						
Principal repayments (budget to pay off over seven years)				$35,714	*$250,000 ÷ 7 years*	
Interest (annual interest bill on debt)				$30,000	*$250,000 x 12%*	
Income tax (annual estimate)				$30,000	*estimate*	
Owner's salary (estimate of salary for each family on the farm)				$70,000	*estimate*	
Extra for further investment (expansion, off-farm investment, super etc.)				$120,000	*estimate*	
	L	**TOTAL PROFIT MARGIN NEEDED PER YEAR**		**$285,714**		
	M	**PROFIT MARGIN/TONNE**	***(L x E) ÷ D***	**$357**	*($285,714x50%) ÷ 400t*	
ON-FARM TARGET PRICE	**N**	per tonne	***(C + K + M)***	**$1,892**	*$1,297+$238+$357*	
		per tray **100 trays/t**	***(N ÷ 100)***	**$18.92**	*$1,892 ÷ 100*	

5. Gross Margins

5.1 Apples - Packed

							Your figures
INCOME						**$/ha**	
Marketable yield				2,885	cartons		
Price				$23.75	per carton	$68,519	
Less Levy				$0.0153	per kg	$574	
Less Commission				15%		$10,278	
Total Net Return						**$57,667**	
COSTS							
Soil management							
Slashing	4	1	hr/ha	@	$18.30 per hr	$73	
Herbicide							
Herbicide	1	3	l/ha	@	$12.70 per l	$38	
Sprayseed	5	3	l/ha	@	$11.40 per l	$171	
Application	6	2	hr/ha	@	$18.30 per hr	$220	
Water costs							
Infrastructure use fee		6	ML/ha	@	$15 per ML	$90	
Drainage		6	ML/ha	@	$15 per ML	$90	
Power		6	ML/ha	@	$15 per ML	$90	
Note: Details of other water costs are in Appendix B.							
Fertiliser							
Urea		0.177	t/ha	@	$500 per t	$89	
Double super		0.125	t/ha	@	$530 per t	$66	
Potassium nitrate		0.066	t/ha	@	$1,200 per t	$79	
Zintrac	2	1	l/ha	@	$12 per l	$24	
Application	3	0.6	hr/ha	@	$18.30 per hr	$33	
Calcium spray	5	10	kg/ha	@	$22 per kg	$1,100	
Isomate C		1000	ties	@	$180 per '000	$180	
Contract labour							
Thinning		1,480	trees/ha	@	$2.50 per tree	$3,700	
Pruning		1,480	trees/ha	@	$2.50 per tree	$3,700	
Pest/disease management							
Pesticide sprays						$450	
Application		12	hr/ha	@	$18.30 per hr	$220	
Other labour cost				@	$250 per ha	$250	
Fuel and oil				@	$300 per ha	$300	
Total production cost						**$10,963**	
Picking		6.9	hr/t	@	$17.50 per hr	$6,038	
Packing, cooling & boxes		2,885	cartons/ha	@	$7.48 per carton	$21,580	
Freight		2,885	cartons/ha	@	$1.31 per carton	$3,779	
Other shed costs		2,885	cartons/ha	@	$0.46 per carton	$1,327	
Total Variable Costs						**$43,687**	
GROSS MARGIN	per ha					**$13,980**	
	per ML					**$2,330**	

5.2 Apples – Loose

INCOME				**$/ha**	**Your figures**
Marketable yield			37.5 t		
Price			$950 per t	$35,625	
Less Levy			$0.0153 per kg	$574	
Less Commission			15%	$5,344	
Total Net Return				**$29,707**	
COSTS					
Total production cost				$10,963	
Picking cost	6.9 hr/t	@	$17.50 per hr	$6,038	
Total Variable Costs				**$17,001**	
GROSS MARGIN			***per ha***	**$12,706**	
			per ML	**$2,118**	

Specific assumptions - Apples	
Variety	Various
Yield	50 tonnes/ha; 75% pack out
Irrigation system	Trickle irrigation
Tree-row spacing	4.88m x 3.05m
Thinning/Pruning system	Manual (own labour or contractor)
Plant density	1,480 trees/ha
Market	Melbourne
Commission	15%
Package type	13 kg carton
Water use	6 ML/ha

Agronomic Notes

Commercial growing of apples is in its infancy in the Loddon Murray region. Careful consideration needs to be given to variety selection owing to the extreme temperature conditions experienced during summer. Warm climate varieties such as Pink Lady, Sundowner, and Royal Gala are being planted.

The final pack-out of apples was estimated at 75% of total yield. The reduced pack-out rate is owing to the characteristic of apples.

Effect of price and yield on gross margin per hectare - Packed

		Price ($ per carton)						
		$18	**$20**	**$22**	**$23.75**	**$26**	**$28**	**$30**
Yield (cartons per hectare)	**2,000**	($3,444)	($44)	$3,357	$6,332	$10,157	$13,557	$16,957
	2,200	($2,694)	$1,047	$4,787	$8,059	$12,267	$16,007	$19,747
	2,400	($1,943)	$2,138	$6,218	$9,788	$14,378	$18,458	$22,538
	2,885	($120)	$4,784	$9,689	$13,980	$19,498	$24,402	$29,307
	2,800	($443)	$4,318	$9,078	$13,243	$18,598	$23,358	$28,118
	3,000	$307	$5,408	$10,508	$14,970	$20,708	$25,808	$30,908
	3,200	$1,058	$6,498	$11,939	$16,699	$22,819	$28,259	$33,699

Notes: Shaded box denotes gross margin based on average yield and price.
Rounded off to the nearest dollar.

5.3 Apricots - Packed

INCOME						**$/ha**	**Your figures**
Marketable yield				1,800	cartons		
Price				$21.50	per carton	$38,700	
Less Levy				$0.01	per kg	$180	
Less Commission				15%		$5,805	
Total Net Return						**$32,715**	
COSTS							
Soil management							
Slashing	4	1	hr/ha	@	$18.30 per hr	$73	
Weed control							
Herbicide	1	3	l/ha	@	$12.70 per l	$38	
Sprayseed	5	3	l/ha	@	$11.40 per l	$171	
Application	6	1	hr/ha	@	$18.30 per hr	$110	
Water costs							
Infrastructure use fee		6	ML/ha	@	$15 per ML	$90	
Drainage		6	ML/ha	@	$15 per ML	$90	
Power		6	ML/ha	@	$15 per ML	$90	
Note: Details of other water costs are in Appendix B.							
Fertiliser							
Urea		0.199	t/ha	@	$500 per t	$100	
Double super		0.125	t/ha	@	$530 per t	$66	
Potassium nitrate		0.066	t/ha	@	$1,200 per t	$79	
Zintrac	2	1	l/ha	@	$12 per l	$24	
Spreading	3	0.8	hr/ha	@	$18.30 per hr	$44	
Contract labour							
Thinning		670	trees/ha	@	$2.50 per tree	$1,675	
Pruning		670	trees/ha	@	$2.50 per tree	$1,675	
Pest/disease management							
Pesticide sprays						$383	
Application		11	hr/ha	@	$18.30 per hr	$201	
Other labour cost				@	$250 per ha	$250	
Fuel and oil				@	$300 per ha	$300	
Total production cost						**$5,459**	
Picking		13.9	hr/t	@	$17.50 per hr	$4,865	
Packing		1,800	cartons/ha	@	$0.92 per carton	$1,656	
Cooling		1,800	cartons/ha	@	$0.26 per carton	$468	
Freight and packaging		1,800	cartons/ha	@	$2.71 per carton	$4,878	
Other shed costs		1,800	cartons/ha	@	$0.16 per carton	$288	
Total Variable Costs						**$17,614**	
GROSS MARGIN					***per ha***	**$15,101**	
					per ML	**$2,517**	

5.4 Apricots – Loose

INCOME					**$/ha**	**Your figures**
Marketable yield			18 t			
Price			$1,600	per t	$28,800	
Less Levy			$0.01	per kg	$180	
Less Commission			15%		$4,320	
Total Net Return					**$24,300**	
COSTS						
Total production costs					$5,459	
Picking	13.9 hr/t	@	$17.50	per hr	$4,865	
Total Variable Costs					**$10,324**	
GROSS MARGIN				***per ha***	**$13,976**	
				per ML	**$2,329**	

Specific assumptions - Apricots	
Variety	Various
Yield	20 tonnes/ha; 90% pack out
Irrigation system	Trickle irrigation
Tree-row spacing	4.88m x 3.05m
Thinning/Pruning system	Manual (own labour or contractor)
Plant density	670 trees/ha
Market	Domestic
Commission	15%
Package type	10 kg cartons
Water use	6 ML/ha

Agronomic Notes

Apricots have a similar advantage to plums in that they are generally more lime and salt tolerant than peaches or nectarines. Most of the apricot trees in the Loddon Murray region are older plantings and crop loads may vary from year to year.

Effect of price and yield on gross margin per hectare - Packed

		Price ($ per carton)						
		$16	**$18**	**$20**	**$22**	**$24**	**$26**	**$28**
Yield (cartons per hectare)	**1,500**	$4,656	$7,206	$9,756	$11,669	$14,856	$17,406	$19,956
	1,600	$5,339	$8,059	$10,779	$12,819	$16,219	$18,939	$21,659
	1,700	$6,004	$8,894	$11,784	$13,951	$17,564	$20,454	$23,344
	1,800	$6,686	$9,746	$12,806	$15,101	$18,926	$21,986	$25,046
	1,900	$7,369	$10,599	$13,829	$16,251	$20,289	$23,519	$26,749
	2,000	$8,034	$11,434	$14,834	$17,384	$21,634	$25,034	$28,434
	2,100	$8,716	$12,286	$15,856	$18,534	$22,996	$26,566	$30,136

Notes: Shaded box denotes gross margin based on average yield and price.
Rounded off to the nearest dollar.

5.5 Nectarines - Packed

INCOME						**$/ha**	**Your figures**
Marketable yield				2,340	cartons		
Price				$19.50	per carton	$45,630	
Less Levy				$0.01	per kg	$234	
Less Commission				15%		$6,845	
Total Net Return						**$38,551**	
COSTS							
Soil management							
Slashing	4	1	hr/ha	@	$18.30 per hr	$73	
Weed control							
Herbicide	1	4	l/ha	@	$12.70 per l	$51	
Sprayseed	5	3	l/ha	@	$11.40 per l	$171	
Application	6	2	hr/ha	@	$18.30 per hr	$220	
Water costs							
Infrastructure use fee		6	ML/ha	@	$15 per ML	$90	
Drainage		6	ML/ha	@	$15 per ML	$90	
Power		6	ML/ha	@	$15 per ML	$90	
Note: Details of other water costs are in Appendix B.							
Fertiliser							
Urea		0.307	t/ha	@	$500 per t	$154	
Double super		0.125	t/ha	@	$530 per t	$66	
Potassium nitrate		0.066	t/ha	@	$1,200 per t	$79	
Zintrac	2	2	l/ha	@	$12 per l	$48	
Application	3	1.8	hr/ha	@	$18.30 per hr	$99	
Trace element	2	1	kg/ha	@	$22 per kg	$44	
Contract labour							
Thinning		820	trees/ha	@	$3 per tree	$2,460	
Pruning		820	trees/ha	@	$3 per tree	$2,460	
Pest/disease management							
Pesticide sprays						$450	
Application		12	hr/ha	@	$18.30 per hr	$220	
Other labour cost				@	$250 per ha	$250	
Fuel and oil				@	$300 per ha	$300	
Total production cost						**$7,415**	
Picking		11.1	hr/t	@	$17.50 per hr	$5,058	
Packing		2,340	cartons/ha	@	$0.92 per carton	$2,153	
Cooling		2,340	cartons/ha	@	$0.26 per carton	$608	
Freight and packaging		2,340	cartons/ha	@	$2.71 per carton	$6,341	
Other shed costs		2,340	cartons/ha	@	$0.16 per carton	$374	
Total Variable Costs						**$21,949**	
GROSS MARGIN					***per ha***	**$16,602**	
					per ML	**$2,767**	

5.6 Nectarines – Loose

INCOME					**$/ha**	**Your figures**
Marketable yield			23.4 t			
Price			$1,400	per t	$32,760	
Less Levy			$0.01	per kg	$234	
Less Commission			15%		$4,914	
Total Net Return					**$27,612**	
COSTS						
Total production cost					$7,415	
Picking	11.1 hr/t	@	$17.50	per hr	$5,058	
Total Variable Costs					**$12,473**	
GROSS MARGIN				***per ha***	**$15,139**	
				per ML	**$2,523**	

Specific assumptions - Nectarines	
Variety	Various
Yield	26 tonnes per ha; 90% pack out
Irrigation system	Trickle irrigation
Tree-row spacing	4.88m x 2.5m
Thinning/Pruning system	Manual (own labour or contractor)
Plant density	820 trees/ha
Market	Domestic
Commission	15%
Package type	10 kg carton
Water use	6 ML/ha

Agronomic Notes

A mid-season variety was chosen in this study and the associated revenue and costs have been estimated accordingly. Differences in costs could occur, as certain varieties require more attention when pruning and the late season varieties require more water throughout the growing season.

There is a high cost of labour with nectarine trees. Nectarine trees require both summer and winter pruning and may be thinned several times.

Where possible fertiliser is put through the irrigation system - in this example both urea and potassium nitrate would be applied through fertigation. However, zinc must be foliar sprayed and superphosphate is spread along the tree line.

Effect of price and yield on gross margin per hectare - Packed

		Price ($ per carton)						
		$14	**$16**	**$18**	**$19.50**	**$22**	**$24**	**$26**
Yield (cartons per hectare)	**2,000**	$3,763	$7,163	$10,563	$13,113	$17,363	$20,763	$24,163
	2,100	$4,328	$7,898	$11,468	$14,146	$18,608	$22,178	$25,748
	2,200	$4,893	$8,633	$12,373	$15,178	$19,853	$23,593	$27,333
	2,340	$5,663	$9,641	$13,619	$16,603	$21,575	$25,553	$29,531
	2,500	$6,571	$10,821	$15,071	$18,258	$23,571	$27,821	$32,071
	2,600	$7,118	$11,538	$15,958	$19,273	$24,798	$29,218	$33,638
	2,700	$7,683	$12,273	$16,863	$20,306	$26,043	$30,633	$35,223

Notes: Shaded box denotes gross margin based on average yield and price.
Rounded off to the nearest dollar.

5.7 Peaches - Packed

INCOME					**$/ha**	**Your figures**
Marketable yield				5,625 trays		
Price				$9.25 per tray	$52,031	
Less Levy				$0.01 per kg	$225	
Less Commission				15%	$7,805	
Total Net Return					**$44,001**	
COSTS						
Soil management						
Slashing	4	1 hr/ha	@	$18.30 per hr	$73	
Weed control						
Herbicide	1	1 l/ha	@	$12.70 per l	$13	
Sprayseed	5	3 l/ha	@	$11.40 per l	$171	
Application	6	1 hr/ha	@	$18.30 per hr	$110	
Water costs						
Infrastructure use fee		6 ML/ha	@	$15 per ML	$90	
Drainage		6 ML/ha	@	$15 per ML	$90	
Power		6 ML/ha	@	$15 per ML	$90	
Note: Details of other water costs are in Appendix B.						
Fertiliser						
Urea		0.307 t/ha	@	$500 per t	$154	
Double super		0.125 t/ha	@	$530 per t	$66	
Potassium nitrate	1	0.066 t/ha	@	$1,200 per t	$79	
Zintrac	2	1 l/ha	@	$12 per l	$24	
Application	3	0.6 hr/ha	@	$18.30 per hr	$33	
Contract labour						
Thinning		820 trees/ha	@	$3 per tree	$2,460	
Pruning		820 trees/ha	@	$3 per tree	$2,460	
Pest/disease management						
Pesticide sprays					$450	
Application		12 hr/ha	@	$18.30 per hr	$220	
Other labour cost			@	$250 per ha	$250	
Fuel and oil			@	$300 per ha	$300	
Total production cost					**$7,133**	
Picking		8.9 hr/t	@	$17.50 per hr	3,903	
Packing		5,625 trays/ha	@	$0.75 per tray	$4,219	
Cooling		5,625 trays/ha	@	$0.26 per tray	$1,463	
Freight and packaging		5,625 trays/ha	@	$2.64 per tray	$14,850	
Other shed costs		5,625 trays/ha	@	$0.18 per tray	$1,013	
Total Variable Costs					**$32,581**	
GROSS MARGIN				***per ha***	**$11,420**	
				per ML	**$1,903**	

5.8 Peaches – Loose

INCOME				**$/ha**	**Your figures**
Marketable yield			22.5 t		
Price			$1,100 per t	$24,750	
Less Levy			$0.01 per kg	$225	
Less Commission			15%	$3,713	
Total Net Return				**$20,812**	
COSTS					
Total production cost				$7,133	
Picking cost	8.9 hr/t	@	$17.50 per hr	$3,903	
Total Variable Costs				**$11,036**	
GROSS MARGIN				**$9,776**	
				$1,629	

Specific assumptions - Peaches	
Variety	Various
Yield	25 tonnes/ha; 90% pack out
Irrigation system	Trickle irrigation
Tree-row spacing	4.88m x 2.5m
Thinning/Pruning system	Manual (own labour or contractor)
Plant density	820 trees/ha
Market	Domestic
Commission	15%
Package type	4 kg tray
Water use	6 ML/ha

Agronomic Notes

The peach used for this study is of the mid-season variety.

Peaches are handled in a similar manner to nectarines in respect to thinning and pruning. Fertilisers are applied through the irrigation system where possible, however zinc is foliar sprayed and superphosphate is spread into the tree line. Other fertilisers, for example calcium nitrate, may be applied on an irregular basis to promote tree vigour.

Effect of price and yield on gross margin per hectare - Packed

		Price ($ per tray)						
		$6	**$7**	**$8**	**$9.25**	**$10**	**$11**	**$12**
Yield (trays per hectare)	**4,000**	($4,978)	($1,578)	$1,822	$6,072	$8,622	$12,022	$15,422
	5,000	($4,448)	($198)	$4,052	$9,365	$12,552	$16,802	$21,052
	6,000	($3,901)	$1,199	$6,299	$12,674	$16,499	$21,599	$26,699
	5,625	($4,117)	$664	$5,445	$11,421	$15,008	$19,789	$24,570
	7,000	($3,371)	$2,579	$8,529	$15,967	$20,429	$26,379	$32,329
	8,000	($2,823)	$3,977	$10,777	$19,277	$24,377	$31,177	$37,977
	9,000	($2,293)	$5,357	$13,007	$22,570	$28,307	$35,957	$43,607

Notes: Shaded box denotes gross margin based on average yield and price.
Rounded off to the nearest dollar.

5.9 Plums - Packed

INCOME						$/ha	Your figures
Marketable yield				1,800	cartons		
Price				$19	per carton	$34,200	
Less Levy				$0.01	per kg	$180	
Less Commission				15%		$5,130	
Total Net Return						**$28,890**	
COSTS							
Soil management							
Slashing	4	1	hr/ha	@	$18.30 per hr	$73	
Weed control							
Herbicide	1	3	l/ha	@	$12.70 per l	$38	
Sprayseed	5	3	l/ha	@	$11.40 per l	$171	
Application	6	1	hr/ha	@	$18.30 per hr	$110	
Water costs							
Infrastructure use fee		6	ML/ha	@	$15 per ML	$90	
Drainage		6	ML/ha	@	$15 per ML	$90	
Power		6	ML/ha	@	$15 per ML	$90	
Note: Details of other water costs are in Appendix B.							
Fertiliser							
Urea		0.199	t/ha	@	$500 per t	$100	
Double super		0.125	t/ha	@	$530 per t	$66	
Potassium nitrate	1	0.066	t/ha	@	$1,200 per t	$79	
Zintrac	2	1	l/ha	@	$12 per l	$24	
Application	3	0.6	hr/ha	@	$18.30 per hr	$33	
Contract labour							
Thinning		820	trees/ha	@	$2.50 per tree	$2,050	
Pruning		820	trees/ha	@	$2.50 per tree	$2,050	
Pest/disease management							
Pesticide sprays						$383	
Application		11	hr/ha	@	$18.30 per hr	$201	
Other labour cost				@	$250 per ha	$250	
Fuel and oil				@	$300 per ha	$300	
Total production cost						$6,198	
Picking		12.2	hr/t	@	$17.50 per hr	$4,270	
Packing		1,800	cartons/ha	@	$0.92 per carton	$1,656	
Cooling		1,800	cartons/ha	@	$0.26 per carton	$468	
Freight and packaging		1,800	cartons/ha	@	$2.71 per carton	$4,878	
Other shed costs		1,800	cartons/ha	@	$0.16 per carton	$288	
Total Variable Costs						**$17,758**	
GROSS MARGIN					***per ha***	**$11,132**	
					per ML	**$1,855**	

5.10 Plums – Loose

INCOME				$/ha	Your figures
Marketable yield			18 t		
Price			$1,300 per t	$23,400	
Less Levy			$0.01 per kg	$180	
Less Commission			15%	$3,510	
Total Net Return				**$19,710**	
COSTS					
Total production cost				$6,198	
Picking cost	12.2 hr/t	@	$17.50 per hr	$4,270	
Total Variable Costs				**$10,468**	
GROSS MARGIN			***per ha***	**$9,242**	
			per ML	**$1,540**	

Specific assumptions - Plums	
Variety	Tegan Blue
Yield	20 tonnes/ha; 90% pack out
Irrigation system	Trickle irrigation
Tree-row spacing	4.88m x 3.05m
Thinning/Pruning system	Manual (own labour or contractor)
Plant density	820 trees/ha
Market	Melbourne
Commission	15%
Package type	10 kg carton
Water use	6 ML/ha

Agronomic Notes

The Tegan Blue variety of plums has been used for this study. Plums have historically been the most erratic croppers of all the stonefruit grown in the Loddon Murray region, with production from the same trees sometimes varying by 100% from one season to the next. Plums will continue to be part of the stonefruit crop in the Loddon Murray region owing to their advantage of being relatively salt and lime tolerant.

Effect of price and yield on gross margin per hectare - Packed

		Price ($ per carton)						
		$13	**$15**	**$17**	**$19**	**$21**	**$23**	**$25**
Yield (cartons per hectare)	**1,500**	$600	$3,150	$5,700	$8,250	$10,800	$13,350	$15,900
	1,600	$1,045	$3,765	$6,485	$9,205	$11,925	$14,645	$17,365
	1,700	$1,507	$4,397	$7,287	$10,177	$13,067	$15,957	$18,847
	1,800	$1,952	$5,012	$8,072	$11,132	$14,192	$17,252	$20,312
	1,900	$2,397	$5,627	$8,857	$12,087	$15,317	$18,547	$21,777
	2,000	$2,860	$6,260	$9,660	$13,060	$16,460	$19,860	$23,260
	2,100	$3,305	$6,875	$10,445	$14,015	$17,585	$21,155	$24,725

Notes: Shaded box denotes gross margin based on average yield and price.
Rounded off to the nearest dollar.

5.11 Table Grapes

INCOME					$/ha	Your figures
Marketable yield		1,680 boxes				
Price		$12.50 per box			$21,000	
Less Levy		$0.01 per kg			$168	
Less Commission		15%			$3,150	
Total Net Return					**$17,682**	
COSTS						
Soil management						
Rotary hoeing		3 hr/ha	@	$18.20 per hr	$55	
Discing		2 hr/ha	@	$18.20 per hr	$36	
Tyned cultivation	2	1 hr/ha	@	$18.20 per hr	$36	
Weed control						
Sprayseed	5	3 l/ha	@	$11.40 per l	$171	
Application	5	1 hr/ha	@	$18.20 per hr	$91	
Slashing and mulching		1 hr/ha	@	$18.20 per hr	$18	
Cover crop (ryecorn)						
Establishment					$227	
Water costs						
Infrastructure use fee		7.5 ML/ha	@	$15 per ML	$113	
Drainage		7.5 ML/ha	@	$15 per ML	$113	
Power		7.5 ML/ha	@	$15 per ML	$113	
Note: Details of other water costs are in Appendix B.						
Fertiliser						
Urea		0.125 t/ha	@	$500 per t	$63	
Triple super		0.1 t/ha	@	$364 per t	$36	
Spreading		0.6 hr	@	$18.20 per hr	$11	
Other management						
Pruning		56 hr	@	$17.50 per hr	$980	
Bunch thinning		40 hr	@	$17.50 per hr	$700	
Bunch trimming		40 hr	@	$17.50 per hr	$700	
GA treatments	5				$239	
Application		16.5 hr	@	$18.20 per hr	$300	
Plastic covers (3 yr life)		2964 m/ha	@	$1 per m	$988	
Labour (rollout & rollup)		38.8 hr/ha	@	$17.50 per hr	$679	
Pest/disease management						
Fungicide sprays					$362	
Application		8 hr/ha	@	$18.20 per hr	$146	
Total Production Cost					**$6,177**	
Picking		6 hr/t	@	$17.50 per hr	$1,960	
Packing		1,680 boxes/ha	@	$0.86 per box	$1,445	
Cooling		1,680 boxes/ha	@	$0.26 per box	$437	
Boxes		1,680 boxes/ha	@	$1.15 per box	$1,932	
Freight		1,680 boxes/ha	@	$0.98 per box	$1,646	
Other shed costs		1,680 boxes/ha	@	$0.09 per box	$151	
Total Variable Costs					**$13,748**	
GROSS MARGIN				***per ha***	**$3,934**	
				per ML	**$525**	

Specific assumptions - Table grapes	
Variety	Own-rooted Thompson seedless (sultana)
Yield	18.7 tonne/ha; 90% pack out
Irrigation system	Trickle irrigation
Vine-row spacing	3.66m x 2.44m
Pruning system	Cane pruning (own labour or contractor)
Cover crop	Ryecorn, sown at 70 kg/ha
Market	Melbourne
Commission	15%
Package type	10 kg open styrene, lidded and taped
Water use	7.5 ML/ha

Agronomic Notes

There are primarily ten varieties of table grapes grown in the Loddon Murray region. Returns for each variety vary greatly because of difference in yield, prices and costs of production. Sultana is an expensive variety to produce because it is cane pruned and is commonly sprayed with growth regulator to enlarge crop and improve the uniformity of crop size.

Effect of price and yield on gross margin per hectare

		Price ($ per box)						
		$6	**$8**	**$10**	**$12.50**	**$14**	**$16**	**$18**
Yield (cartons per hectare)	**1,100**	($5,628)	($3,758)	($1,888)	$450	$1,852	$3,722	$5,592
	1,300	($5,541)	($3,331)	($1,121)	$1,642	$3,299	$5,509	$7,719
	1,500	($5,437)	($2,887)	($337)	$2,851	$4,763	$7,313	$9,863
	1,680	($5,348)	($2,492)	$364	$3,934	$6,076	$8,932	$11,788
	1,800	($5,289)	($2,229)	$831	$4,656	$6,951	$10,011	$13,071
	2,000	($5,184)	($1,784)	$1,616	$5,866	$8,416	$11,816	$15,216
	2,200	($5,097)	($1,357)	$2,383	$7,058	$9,863	$13,603	$17,343

Notes: Shaded box denotes gross margin based on average yield and price.
Rounded off to the nearest dollar.

5.12 Winegrapes

INCOME					**$/ha**	**Your figures**
Marketable yield				22 t/ha		
Price				$500 per t	$11,000	
Less levies				$14.65 per t	$322	
Total Net Return					**$10,678**	
COSTS						
Soil management						
Rotary hoeing		3 hr	@	$18.20 per hr	$55	
Discing		2 hr	@	$18.20 per hr	$36	
Tyned cultivation		2 hr	@	$18.20 per hr	$36	
Weed control						
Herbicide	3	2.2 l/ha	@	$12.70 per l	$84	
Application - herbicide	3	1.25 hr	@	$18.20 per hr	$68	
Slashing and mulching	5	1 hr	@	$18.20 per hr	$91	
Cover crop (ryecorn)					$227	
Water costs						
Infrastructure use fee		6 ML/ha	@	$15 per ML	$90	
Drainage		6 ML/ha	@	$15 per ML	$90	
Power		6 ML/ha	@	$15 per ML	$90	
Note: Details of other water costs are in Appendix B.						
Fertiliser						
Urea		0.25 t/ha	@	$500 per t	$125	
Triple super		0.1 t/ha	@	$364 per t	$36	
Zintrac	2	2 l/ha	@	$12 per l	$48	
Other management						
Pruning - mechanical		3.5 hr	@	$80 per hr	$280	
Pest and disease management						
Fungicide/pesticide					$556	
Application		8 hr/ha	@	$18.20 per hr	$146	
Other labour cost				$250 per ha	$250	
Contract harvesting		6 t/hr	@	$431 per hr	$1,580	
Bin hire and local freight		22 t/ha	@	$17 per t	$374	
Freight to winery		22 t/ha		$45 per t	$990	
Total Variable Costs					**$5,252**	
GROSS MARGIN				***per ha***	**$5,426**	
				per ML	**$904**	

Specific assumptions - Wine grapes	
Variety	Various
Yield	24.4 tonne/ha; 90% marketable
Irrigation system	Trickle irrigation
Vine-row spacing	3.3m x 2.1m
Pruning system	Minimal (mechanical)
Cover crop	Ryecorn, sown at 70 kg/ha
Market	Wineries
Water use	6 ML/ha

Agronomic Notes

Winegrapes are a crop that can be produced with a high degree of mechanisation. Both pruning and harvesting in this manner can lower the labour requirement and therefore reduce the annual cost of production. There are different management practices employed in both the pruning and harvesting of the vines. These management practices can dramatically affect the costs of chemicals and the quality of the crop.

Pruning is done by hand and/or mechanical (in-house or by a contractor). A contractor charges about $80 per hour. If you are hand pruning, a total of 50 hours per hectare may be required costing about $875 per hectare. If mechanically pruning, there will still be a need for some hand pruning.

It is advised to contact a winery with a view to secure a contract.

ABARE (2005) projected that over the next five years production of premium red and white will increase by 5 per cent and 23 per cent, respectively. The prices of red wine grapes are expected to stabilise in the next 24 months as a result of a more balanced supply and demand situation. The indicator price of white wine grapes is forecast to slowly decline. Overall, the prices for both wine grapes are projected to gradually converge as the industry continues to mature and growth in the production stabilises.

Price variation

The price variation per tonne has ranged from **$200 - $800**, depending on quality and variety.

Effect of price and yield on gross margin per hectare

		Price ($ per tonne)						
		$200	**$300**	**$400**	**$500**	**$600**	**$700**	**$800**
Yield (tonnes per hectare)	**15**	($1,536)	($36)	$1,464	$2,964	$4,464	$5,964	$7,464
	17	($1,432)	$268	$1,968	$3,668	$5,368	$7,068	$8,768
	19	($1,329)	$571	$2,471	$4,371	$6,271	$8,171	$10,071
	22	($1,174)	$1,026	$3,226	$5,426	$7,626	$9,826	$12,026
	24	($1,072)	$1,328	$3,728	$6,128	$8,528	$10,928	$13,328
	26	($969)	$1,631	$4,231	$6,831	$9,431	$12,031	$14,631
	28	($865)	$1,935	$4,735	$7,535	$10,335	$13,135	$15,935

Notes: Shaded box denotes gross margin based on average yield and price.
Rounded off to the nearest dollar.

5.13 Rockmelons

INCOME						$/ha	Your figures
Marketable yield		2,000	boxes				
Price		$15	per box			$30,000	
Less Levy		0.50%	of gross value			$150	
Less Commission		15%				$4,500	
Total Net Return						**$25,350**	
COSTS							
Land preparation							
Deep Ripping		4	hr/ha	@	$26.10 per hr	$104	
Discing	1	3	hr	@	$26.10 per hr	$78	
Scarifying		1	hr/ha	@	$26.10 per hr	$26	
Rotary hoeing	2	2.5	hr	@	$26.10 per hr	$131	
Form beds		2	hr/ha	@	$26.10 per hr	$52	
Irrigation system - trickle		6,666	m	@	$0.13 per m	$867	
Plastic mulch		6,666	m	@	$0.10 per m	$667	
Laying mulch and trickle- labour		6	hr	@	$17.50 per hr	$105	
Laying mulch and trickle- tractor		2	hr	@	$26.10 per hr	$52	
Water costs							
Infrastructure use fee		4	ML/ha	@	$15 per ML	$60	
Drainage		4	ML/ha	@	$15 per ML	$60	
Power		4	ML/ha	@	$15 per ML	$60	
Note: Details of other water costs are in Appendix B.							
Fertiliser							
Urea		0.3	t/ha	@	$500 per t	$150	
Double super		0.125	t/ha	@	$530 per t	$66	
Potassium nitrate		0.15	t/ha	@	$1,200 per t	$180	
Calcium nitrate		0.1	t/ha	@	$800 per t	$80	
Application		1	hr	@	$26.10 per hr	$26	
Planting							
Seed		1.4	kg/ha	@	$1,200 per kg	$1,680	
Planting - labour and tractor		15	hr	@	$43.60 per hr	$654	
Pest/disease management							
Pesticide sprays						$282	
Application - tractor		8	hr/ha	@	$26.10 per hr	$209	
Picking		15	hr/t	@	$17.50 per hr	$8,663	
Bin pick up						$305	
Packing		2,000	boxes/ha	@	$1 per box	$2,000	
Cooling		2,000	boxes/ha	@	$0.26 per box	$520	
Boxes		2,000	boxes/ha	@	$2.40 per box	$4,800	
Freight		2,000	boxes/ha	@	$1.30 per box	$2,600	
Other shed costs		2,000	boxes/ha	@	$0.20 per box	$400	
Clean-up							
Mulch and trickle retrieval		10	hr/ha	@	$17.50 per hr	$175	
Mulch and trickle disposal		20	t/ha	@	$6 per tonne	$120	
Total Variable Costs						**$24,877**	
GROSS MARGIN					***per ha***	**$473**	
					per ML	**$118**	

Specific assumptions – Rockmelons	
Variety	Various
Yield	33 tonnes/ha; 97% pack out
Irrigation system	Trickle irrigation
Spacing	0.3m to 0.4m between plants x 1.5m beds
Planting system	Raised beds with plastic mulch
Market	Melbourne
Commission	15%
Package type	16-kg styrene
Water use	4 ML/ha

Agronomic Notes

Powdery mildew is one of the main disease problems but crops sown from September to early October can be grown without the need for fungicide sprays. Rockmelons sown from late November may require a number of sprays to control the disease.

Gypsum may be applied to improve soil structure at a rate of 2.5 tonnes per hectare.

Effect of price and yield on gross margin per hectare

		Price ($ per box)						
		$9.00	**$11.00**	**$13.00**	**$15.00**	**$17.00**	**$19.00**	**$21.00**
Yield (cartons per hectare)	**1,700**	($9,042)	($6,169)	($3,296)	($423)	$2,450	$5,323	$8,196
	1,800	($9,338)	($6,296)	($3,254)	($212)	$2,830	$5,872	$8,914
	1,900	($9,371)	($6,160)	($2,949)	$262	$3,473	$6,684	$9,895
	2,000	($9,667)	($6,287)	($2,907)	$473	$3,853	$7,233	$10,613
	2,100	($9,963)	($6,414)	($2,865)	$684	$4,233	$7,782	$11,331
	2,200	($9,996)	($6,278)	($2,560)	$1,158	$4,876	$8,594	$12,312
	2,300	($10,292)	($6,405)	($2,518)	$1,369	$5,256	$9,143	$13,030

Notes: Shaded box denotes gross margin based on average yield and price.
Rounded off to the nearest dollar.

5.14 Fresh market Tomatoes (Trellis)

INCOME					$/ha	Your figures
Marketable yield		6,000 cartons				
Average Price		$10 per carton			$60,000	
Less Levy		$0.03 per carton			$180	
Less Commission		15%			$9,000	
Total Net Return					$50,820	
COSTS						
Land preparation						
Deep Ripping		4 hr/ha	@	$26.10 per hr	$104	
Discing	1	3 hr/ha	@	$26.10 per hr	$78	
Contract lasering – 33% of cost			@	$2,000 per ha	$667	
Scarifying		1 hr/ha	@	$26.10 per hr	$26	
Rotary hoeing	2	2.5 hr	@	$26.10 per hr	$131	
Irrigation system - trickle		6,666 m	@	$0.13 per m	$867	
Form beds		2 hr/ha	@	$26.10 per hr	$52	
Plastic mulch		6,666 m	@	$0.10 per m	$667	
Laying mulch and trickle- labour		6 hr	@	$17.50 per hr	$105	
Laying mulch and trickle- tractor		2 hr	@	$26.10 per hr	$52	
Trellis preparation						
Trellis materials (posts, sticks, wire, etc)					$5,600	
Labour	2	20 hr	@	$17.50	$700	
Planting						
Seedlings		19,000 seedlings	@	$100 per '000	$1,900	
Transplanting - tractor		10 hr/ha	@	$26.10 per hr	$261	
Transplanting - labour	2	10 hr/ha	@	$17.50 per hr	$350	
Weed control						
Hand weed plug hole		5 hr/ha	@	$17.50 per hr	$88	
Pre-emergent knockdown					$18	
Post emergent weed control					$41	
Herbicide application - tractor		7 hr/ha	@	$26.10 per hr	$183	
Water costs						
Infrastructure use fee		6 ML/ha	@	$15 per ML	$90	
Drainage		6 ML/ha	@	$15 per ML	$90	
Power		6 ML/ha	@	$15 per ML	$90	
Note: Details of other water costs are in Appendix B.						
Fertiliser						
Urea		0.48 t/ha	@	$500 per t	$240	
Potassium nitrate		0.7 t/ha	@	$1,200 per t	$840	
Calcium nitrate		1 t/ha	@	$800 per t	$800	
Application		1 hr	@	$26.10 per hr	$26	
Pest/disease management						
Sprays					$518	
Application - tractor		7 hr/ha	@	$26.10 per hr	$183	
Casual labour						
Pruning and tying		20 hr/ha	@	$17.50 per hr	$350	
Other labour costs		40 hr/ha	@	$17.50 per hr	$700	
Fuel and oil				$300 per ha	$300	

Picking	4.8 hr/t	@	$17.50 per hr	$8,400	
Bin hire	0.45 t/bin	@	$5 per bin	$225	
Bin pick up				$653	
Packing	6,000 cartons/ha	@	$0.86 per carton	$5,160	
Cooling	6,000 cartons/ha	@	$0.26 per carton	$1,560	
Boxes	6,000 cartons/ha	@	$1.15 per carton	$6,900	
Freight	6,000 cartons/ha	@	$1 per carton	$6,000	
Other Shed Costs	6,000 cartons/ha	@	$0.20 per carton	$1,200	
Clean-up					
Mulch and trickle retrieval	10 hr/ha	@	$17.50 per hr	$175	
Mulch and trickle disposal	20 t/ha	@	$6 per tonne	$120	
Total Variable Costs				**$46,509**	
GROSS MARGIN			***per ha***	**$4,311**	
			per ML	**$718**	

Specific assumptions - Tomatoes	
Variety	Red Ruby
Yield	100 tonnes/ha; 60% pack out
Spacing	0.3m x 1.5m beds
Irrigation system	Trickle
Planting system	Trellis (seedlings)
Market	Fresh, Melbourne
Commission	15%
Package type	10kg carton
Water use	6 ML/ha

Agronomic Notes

Tomatoes are sensitive to a range of pests, with root-knot nematodes and wilt diseases being the main soil-borne problems. Tomatoes are also sensitive to attack by aphids, thrips and caterpillars, and a range of bacterial and fungal spots and specks.

Gypsum may be applied to improve soil structure at a rate of 2.5 tonnes per hectare.

The common varieties grown can be very productive if well grown, but poor irrigation management, inadequate nutrition or the presence of root-knot nematodes will drastically reduce the yield per hectare. Planting tomatoes on trellis requires additional cost of about $5,500 for trellis construction and $300 for pruning and tying the plants.

Effect of price and yield on gross margin per hectare

		Price ($ per carton)						
		$7	**$8**	**$9**	**$10**	**$11**	**$12**	**$13**
Yield (cartons per hectare)	**5,700**	($11,260)	($6,415)	($1,570)	$3,275	$8,120	$12,965	$17,810
	5,800	($11,201)	($6,271)	($1,341)	$3,589	$8,519	$13,449	$18,379
	5,900	($11,049)	($6,034)	($1,019)	$3,996	$9,011	$14,026	$19,041
	6,000	($10,989)	($5,889)	($789)	$4,311	$9,411	$14,511	$19,611
	6,100	($10,930)	($5,745)	($560)	$4,625	$9,810	$14,995	$20,180
	6,200	($10,777)	($5,507)	($237)	$5,033	$10,303	$15,573	$20,843
	6,300	($10,718)	($5,363)	($8)	$5,347	$10,702	$16,057	$21,412

Notes: Shaded box denotes gross margin based on average yield and price.
Rounded off to the nearest dollar.

5.15 Zucchini

INCOME						$/ha	Your figures
Marketable yield		2,160	boxes				
Price				$10	per box	$21,600	
Less Levy				0.50%	of GV	$108	
Less Commission				15%		$3,240	
Total Net Return						**$18,252**	
COSTS							
Land preparation							
Deep Ripping		4	hr/ha	@	$26.10 per hr	$104	
Discing	1	3	hr/ha	@	$26.10 per hr	$78	
Scarifying		1	hr/ha	@	$26.10 per hr	$26	
Rotary hoeing	2	2.5	hr	@	$26.10 per hr	$131	
Form beds		2	hr/ha	@	$26.10 per hr	$52	
Irrigation system - trickle		6,666	m	@	$0.13 per m	$867	
Plastic mulch		6,666	m	@	$0.10 per m	$667	
Laying mulch and trickle- labour		6	hr	@	$17.50 per hr	$105	
Laying mulch and trickle- tractor		2	hr	@	$26.10 per hr	$52	
Planting							
Seed		1.5	kg/ha	@	$250 per kg	$375	
Hand planting - labour		16	hr	@	$17.50 per hr	$280	
Planting - tractor		4	hr	@	$26.10 per hr	$104	
Water costs							
Infrastructure use fee		4	ML/ha	@	$15 per ML	$60	
Drainage		4	ML/ha	@	$15 per ML	$60	
Power		4	ML/ha	@	$15 per ML	$60	
Note: Details of other water costs are in Appendix B.							
Fertiliser							
Urea		0.3	t/ha	@	$500 per t	$150	
Potassium nitrate		0.15	t/ha	@	$1,200 per t	$180	
Calcium nitrate		0.1	t/ha	@	$800 per t	$80	
Manure		0.7	t/ha	@	$250 per t	$175	
Application		3	hr/ha	@	$26.10 per hr	$78	
Pest/disease management							
Pesticide sprays						$109	
Application		2	hr/ha	@	$26.10 per hr	$52	
Clean-up							
Mulch and trickle removal - labour and tractor		3	hr/ha	@	$43.60 per hr	$131	
Mulch and trickle retrieval - labour		6	hr/ha	@	$17.50 per hr	$105	
Mulch and trickle disposal		20	t/ha	@	$6 per tonne	$120	
Picking		9.1	hr/t	@	$17.50 per hr	$3,504	
Bin pick up						$242	
Packing		2,160	boxes/ha	@	$1.25 per box	$2,700	
Cooling		2,160	boxes/ha	@	$0.26 per box	$562	
Boxes		2,160	boxes/ha	@	$1.50 per box	$3,240	
Freight		2,160	boxes/ha	@	$1 per box	$2,160	
Other shed costs		2,160	boxes/ha	@	$0.20 per box	$432	
Total Variable Costs						**$17,040**	
GROSS MARGIN					***per ha***	**$1,212**	
					per ML	**$303**	

Specific assumptions - Zucchini	
Variety	Various
Yield	24 tonnes/ha; 98% pack out
Irrigation system	Trickle irrigation
Planting system	On the raised beds with plastic mulch
Market	Melbourne
Commission	15%
Package type	10-kg styrene
Water use	4 ML/ha

Agronomic Notes

Zucchinis can be grown as early as August for mid season harvest or as late as early January for late season harvest. Most zucchinis grown in the Loddon Murray region are sown for late harvest. The price of zucchinis can fluctuate according to market supply.

Gypsum may be applied to improve soil structure at a rate of 2.5 tonnes per hectare. Farmers use a combination of methods of applying fertiliser: band application, foliar spraying, fertigation, and side dressing.

The seed planting is assumed to be by hand. The time spent planting can be reduced by the use of precision seeders.

Effect of price and yield on gross margin per hectare

		Price ($ per box)						
		7	8	9	10	11	12	13
Yield (cartons per hectare)	**1,860**	($4,265)	($2,693)	($1,121)	$450	$2,022	$3,594	$5,165
	1,960	($4,265)	($2,608)	($952)	$704	$2,360	$4,016	$5,673
	2,060	($4,264)	($2,524)	($783)	$958	$2,698	$4,439	$6,180
	2,160	($4,264)	($2,439)	($614)	$1,212	$3,037	$4,862	$6,687
	2,260	($4,264)	($2,354)	($444)	$1,465	$3,375	$5,285	$7,194
	2,360	($4,265)	($2,270)	($276)	$1,718	$3,712	$5,706	$7,701
	2,460	($4,264)	($2,186)	($107)	$1,972	$4,050	$6,129	$8,208

Notes: Shaded box denotes gross margin based on average yield and price.
Rounded off to the nearest dollar.

6. References

Australian Bureau of Agriculture and Resource Economics, 2005. Outlook 2005 Conference Proceedings: Wine session papers.

Australian Bureau of Statistics, Value of Agricultural Commodities Produced, 2001.

7. Appendices

7.1 Appendix A Inputs and Prices

Production

	Production	Marketable yield		Weight per unit
	t/ha	tonnes	number of units	
Apples	50	37.5	2,885 cartons	13 kg/carton
Apricots	20	18	1,800 cartons	10 kg/carton
Nectarine	26	23.4	2,340 cartons	10 kg/carton
Peaches	25	22.5	5,625 trays	4 kg/tray
Plums	20	18	1,800 cartons	10 kg/carton
Table grapes	18.7	16.8	1,680 boxes	10 kg/box
Wine grapes	24.4	22		
Rockmelon	33	32	2,000 cartons	16 kg/carton
Tomatoes fresh	100	60	6,000 cartons	10 kg/carton
Zucchini	22	21.6	2,160 boxes	10 kg/box

Prices

Fruit	Packed ($/unit)		Loose ($/t)
Apples	$23.75	per carton	$950
Apricots	$21.50	per carton	$1,600
Nectarine	$19.50	per carton	$1,400
Peaches	$9.25	per tray	$1,100
Plums	$19.00	per carton	$1,300
Table grapes	$12.50	per carton	
Wine grapes	$500	per tonne	
Rockmelon	$15.00	per carton	
Tomatoes fresh	$10.00	per carton	
Zucchini	$10.00	per carton	

Post harvest costs ($ per carton, box or tray)

	Nectarine, Plums, Apricots	Peaches	Apples	Table grapes	Zucchini	Rock Melon	Tomato
Packing	$0.92	$0.75		$0.86	$1.25	$1.00	$0.86
Cooling	$0.26	$0.26	0.26	$0.26	$0.26	$0.26	$0.26
Freight			$1.31	$0.98			
Freight and packaging	$2.71	$2.64		$1.15	$1.50	$2.40	$1.15
Other shed costs	$0.16	$0.18	$0.46	$0.09	$0.20	$0.20	$0.20
Packing, cooling, packaging			$7.48				

Pesticide and water use

	Pesticide sprays ($/ha)	Water use (ML/ha)
Apricots	$383	6
Apples	$450	6
Nectarine	$450	6
Peaches	$450	6
Plums	$383	6
Table grapes	$362	7.5
Wine grapes	$556	6
Rockmelon	$282	4
Tomato (fresh)	$518	6
Zucchini	$109	4

Other costs

Labour	Casual labour	$17.50	per hr
	Other orchard labour	$250	per ha
	Picking (tomatoes)	$20	per t
Contract labour	Harvesting (winegrapes)	$431	per hr
	Lasering (tomatoes)	$2,000	per ha
Fertiliser	Urea	$500	per t
	Double super	$530	per t
	13-13-15	$600	per t
	Potassium nitrate	$1,200	per t
	Calcium nitrate	$800	per t
	Zintrac	$12	per l
	Trace element	$22	per kg
	Isomate	$180	per '000
	Fertiliser	$375	per t
	Triple super	$364	per t
	Muriate of potash	$480	per t
	Manure	$250	per t
Gypsum		$35	per t
Harvester (wine grapes)		$431	per hr
Irrigation system – trickle (T-tape)		$0.13	per m
Plastic mulch		$0.10	per m
Plastic mulch disposal		$6	per t
Trellis materials (posts, sticks, wire, etc)		$5,600	per ha
Thinning (apples, plums, apricots)		$2.50	per tree
Pruning (apples, plums, apricots)		$2.50	per tree
Thinning (nectarine, peaches)		$3	per tree
Pruning (nectarine, peaches)		$3	per tree
Fuel and oil		$300	per ha
Bin hire (tomatoes)		$5	per t
Bin hire and freight (wine grapes)		$17	per t
Seeds/seedlings	Rockmelon	$1,200	per kg
	Tomatoes	$100	per 000
	Zucchini	$250	per kg
Levies	Stone fruit & table grape	$0.01	per kg
	Apples	$0.0153	per kg
	Wine grape	$14.65	per t
	Rockmelon & Zucchini	0.50%	of gross value
	Tomato	$0.03	per carton
Commission		15%	of gross value

Freight and packaging costs that some growers incur

Packaging	Tray	Tray	Case	Black tray
Number of units per pallet	176	160	96	132
Weight (kg per unit)	3.2	3.2	10.2	5.2
Cost of packaging	$1.37	$1.37	$1.53	$1.60
Freight per tray/carton				
Melbourne	$0.63	$0.76	$0.66	$0.72
Adelaide	$1.03	$1.24	$1.08	$1.17
Sydney	$1.38	$1.66	$1.45	$1.56
Brisbane	$1.93	$2.34	$2.04	$2.20
Average	$1.24	$1.50	$1.31	$1.41

7.2 Appendix B Irrigation Tariff[1]

In 2001-02, Goulburn-Murray Water (GMW) started implementing tariff changes. The cost of supplying irrigation water is divided into fixed and variable costs.

The fixed cost includes:
- **Service Fee** – to recover fixed costs associated with administering water entitlements
- **Entitlement Storage Fee** – to recover fixed costs associated with harvesting and storing water entitlements
- **Infrastructure Access Fee** – to recover the fixed costs associated with providing access to the distribution system and is based on the proportion of peak daily capacity allocated to the property
- **Additional Service Point** – to recover the fixed costs associated with having more than one service point

An **Infrastructure Use Fee** will recover the variable cost of using the distribution system to deliver water. This variable charge will be paid only on water that is delivered.

The price of water varies greatly within the Loddon Murray region. The 2004-05 pricing schedule from the Goulburn Murray Water is shown below:

PUMPED IRRIGATION	Service fee	Entitlement Storage Fee $/ML	Infrastructure Access Fee $/ML /day	Additional Service Point Fee	Infrastructure Use Fee $/ML
	A	B	C	D	E
Woorinen	$100	$8	$2,531	$50	$20
Nyah	$100	$7	$2,697	$50	$15
Tresco	$100	$7	$4,168	$50	$10

Example:
For a 10-hectare orchard in Woorinen, the total cost of irrigation water is calculated as follows:

F	Property/orchard size	10 ha; 90% irrigated	
G	Water right	60 ML	
H	Water use	70 ML	
I	Capacity share	*10 ha x 90% irrigated area x 10 mm*	0.9 ML/d
J	Service fee	**column A**	$100
K	Additional service point fee	*assume no additional service point*	0
L	Entitlement storage fee	**G x column B** *60ML (water right) x $8*	$480
M	Infrastructure access fee	**I x column C** *0.9 capacity share x $2,531*	$2,278
N	**Sub-total fixed cost (whole orchard)**	**J + K + L + M**	**$2,858**
O	Plus Infrastructure use fee (variable, depending on volume of usage)	**H x column E** *70ML x $20 (Woorinen)*	$1,400
P	**Total cost (whole orchard)**	**N + O** *$2,858 + $1,400*	**$4,258**
Q	**Total cost per hectare**	**P / F** *$4,258 / 10 ha*	**$425.80**
R	**Total cost per ML water use**	**P / H** *$4,258 / 70ML*	**$60.83**

[1] Prepared by Olive Montecillo with the assistance of Leslie Thompson (Price Merrett Consulting, Kerang and Geoff Coburn (GMW, Tatura)

7.3 Appendix C Cost of Establishing Plums on Open Tatura Trellis, Tatura Trellis or Central Leader

Plum variety	Tegan Blue	
Row spacing	4.5m	
Number of rows	21	
Length of rows	118m	
Set up spacing – Open Tatura/ Tatura trellis	8	set ups/row
Set up spacing – Central Leader	7	set ups/row

	Central Leader	Tatura Trellis	Open Tatura
Tree spacing (m)	2.00	1.25	0.75
Number of trees per ha	1,113	1,781	2,968
MATERIALS			
Trees	$8,904	$14,248	$23,744
Posts	$1,558	$3,461	$3,461
Wire	$629	$2,674	$2,068
Staples	$19	$88	$44
Twitchers	$47	$205	$158
Anchors	$819	$819	$819
Milk carton	$223	$356	$594
Clips	$122	$196	$653
Sub-total, materials^	***$12,322***	***$22,047***	***$31,540***
Irrigation system	$7,000	$7,000	$7,000
Land preparation	$2,500	$2,500	$2,500
LABOUR			
Post ramming	$252	$565	$565
Pegging out	$245	$245	$245
Putting out posts	$70	$159	$159
Tying wire	$184	$796	$613
Tying anchor	$61	$61	$61
Putting in anchors	$245	$245	$245
Planting trees	$779	$1,246	$2,077
Putting out cartons	$156	$249	$415
Sub-total, labour^	**$1,992**	**$3,566**	**$4,380**
Total cost^	**$23,814**	**$35,113**	**$45,420**

^ Rounded-off to nearest dollar.

7.4 Appendix D Tractor Cost Guide

A figure of $15.30 per hour has been used for the variable cost of using a tractor. The cost is based on 65 - 75 HP tractors at a purchase price of $70,000. The figure outlined below covers fuel and repairs and maintenance, but does not include the operator's labour.

In addition to tractor variable costs, the cost of repairs and maintenance of implements has to be included. These costs vary from $2.90 per hour for vines to $10.80 per hour for vegetables. The difference is based on the number of implements used and the frequency of use.

Tractor variable costs

		Cost	Cost/hr
Fuel	l/hr	$1.00	$10.00
Batteries	2,000 hr	$250	$0.10
Tyres & Tubes	4,000 hr	$3,500	$0.90
Filters	500 hr	$275	$0.60
Oil Change	250 hr	$60	$0.20
General Repairs	1,000 hr	$3,500	$3.50
5% of new tractor price			

(A)	**Tractor variable costs/hour**	**$15.30**

Implement variable costs - Fruit trees

	Current value	Work (hours/yr)	Variable Cost ($/hr)
Slasher	$6,000	50	$6.00
Spray tank with Fan	$10,000	220	$2.30

(X)	**Average implement variable cost/hr**	**$3.00**
(A)	**Tractor variable costs/hour**	**$15.30**
(A+X=C)	**Total variable costs/hr – Fruit trees**	**$18.30**

Implement variable costs - Grapes

	Current value	Work (hours/yr)	Variable Cost ($/hr)
Slasher	$6,000	40	$7.50
Rotary Hoe	$3,000	150	$1.00
Spray tank with Fan	$10,000	120	$4.20
Off-set-disc	$2,000	20	$5.00
Chisel plough	$6,000	90	$3.30
Furrowing out	$2,500	90	$1.40

(Y)	**Average implement variable cost/hr**	**$2.90**
(A)	**Tractor variable costs/hour**	**$15.30**
(A+Y=D)	**Total variable costs/hr - Grapes**	**$18.20**

Implement variable costs - Vegetables

	Current value	Work (hours/yr)	Variable Cost ($/hr)
Deep Rip	$1,600	50	$1.60
Off-set-disc	$2,100	25	$4.20
Bed forming	$2,600	10	$13.00
Boom spray	$6,100	15	$20.30
Chisel plough	$6,000	25	$12.00
Cultivator bar	$1,600	10	$8.00

(Z)	**Average implement variable cost/hr**	**$10.80**
(A)	**Tractor variable costs/hour**	**$15.30**
(A+Z=E)	**Total variable costs/hr - Vegetables**	**$26.10**