

Blueberry establishment and production costs

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Blueberry production is capital intensive with high development and labour costs. However, the short time interval between establishment and first returns with Southern Highbush varieties coupled with high demand and reasonable prices will offset the high costs.

The figures used in these estimates apply to an average situation and production costs will vary according to the managerial skills of the owner.

The following calculations for northern NSW are based on the establishment and production costs for one hectare with 3700 plants for a farm of 4 ha of blueberries. In northern NSW, growers using Southern Highbush redevelop blueberry beds in year 8 so the production cycle is from year three to year 7 (5 years).

Southern Australian establishment and production costs are based on one hectare with 2000 plants for a farm of 4 ha of blueberries

Assumptions

All labour including the owner/manager has been costed at \$22.00/hr which is made up to include the NSW Horticultural Employees Award Rate plus leave loading, 9% superannuation and 6.9% workers compensation. In many situations the owner/manager or their family may choose to ignore their own labour cost but these costs should be included when calculating a whole enterprise budget.

All machinery variable costs have been included for each operation under Fuel, Oil, Repairs and Maintenance (FORM). It is assumed that the operator has a tractor (77–90 HP, 57–66 HP), slasher and air blast spray unit. The machine cost

for the tractor spray/slasher has been costed at \$44.00/hr plus labour cost. The larger bed former unit 125 HP (93 kW) tractor was also costed at \$44.00/hr plus labour costs.

The minimum size of an orchard necessary to achieve a reasonable scale of production is 4 ha.

In northern NSW there are 3700 plants per hectare in mounded rows 3 m apart. Plants are 0.8 m apart within the row. Each plant produces 2 kg of fruit per season which is a conservative figure. Many growers manage to regularly obtain yields of 2–3 kg per plant. Full production does not occur until year four but some production (0.5–1 kg/plant) will commence in year two (see sensitivity analysis).

In southern Australia there are 2000 to 2100 plants per hectare. Each plant produces 4 kg of fruit. Many growers in this region regularly produce 5 kg of fruit. Full production does not occur until year five.

Punnets are packed at 140 g, which allows for 8–10% shrinkage giving a nominal weight of 125 grams/punnet and an average price/tray of \$30 (12 punnets = 1.5 kg) over the season.

The plant rows are covered with a poly weedmat with two irrigation lines laid beneath the mat at the time of hilling. However, some growers prefer to use woodchip on the tops of mounds and have the sides covered with weedmat.

Southern growers install permanent drip irrigation lines suspended 300 mm above the beds attached to a wire trellis. Woodchip mulch is used instead of weedmat and is replaced annually. Costs include purchase and machine costs to spread the mulch.

Preliminary trials indicate that blueberries require 2–3 ML/ha water. Fertigation is the preferred method of supplying fertiliser to plants. The costs of building a dam, and providing liners, pumps, filters, mains etc. for a 4 ha orchard have not been included in the establishment costs due to the many variations that will be specific to a farm or site.



Costing for a packing shed and coolroom to handle the crop harvested from the 4 ha orchard is available in the establishment costs but they are not used for calculating the gross margin.

Chemical costs were collected from a local supplier and were correct at the time of publication.

Total exclusion netting is essential for blueberry production. The cost of netting one hectare is included in the gross margin, which is for permanent bird netting supplied and erected by a contractor. The netting costs could be delayed until year 3 or 4 but it is far more cost effective to erect netting before mounding and planting. Temporary netting will save in initial set up costs but there will be an additional annual cost of removing and re-netting the orchard each season.

These costs are only a guide. They do not include overhead, fixed costs or GST.

The management practices or products outlined in the budget does not imply a recommendation by

NSW Department of Primary Industries. The management practices and products outlined in the budget are only a guide to costs and practices currently used in the field.

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Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (November 2008). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of New South Wales Department of Primary Industries or the user's independent adviser.

Job number 8927

TABLES FOR SOUTHERN AUSTRALIA

Blueberry establishment costs (per ha)

Blueberry establishment costs	Operation	Unit	Units/ha	Unit cost	Total cost
				\$/unit	\$/ha
Site establishment costs					
Ground preparation machinery costs 77–90 HP (57–66 kW) tractor					
Fuel, oil, repairs, maintenance (FORM)	Herbicide application (FORM)	hours	2	\$44.00	\$88.00
	Herbicide cost	litres	4	\$11.30	\$45.20
	Herbicide labour	hours	2	\$22.00	\$44.00
	Deep ripping + plough (FORM)	hours	7	\$44.00	\$308.00
	Deep ripping labour	hours	7	\$22.00	\$154.00
	Sow green manure crop (FORM)	hours	1.5	\$44.00	\$66.00
	Green manure seed cost	kg	25	\$1.85	\$46.25
	Fertilise green manure	kg	100	\$0.40	\$40.00
	Labour for green manure fertiliser	hours	1.5	\$22.00	\$33.00
	Mark out rows	hours	4	\$22.00	\$88.00
	Rotary hoe rows (FORM)	hours	8	\$44.00	\$352.00
	Rotary hoe labour (2 people)	hours	16	\$22.00	\$352.00
	– 125 HP (93 kW) tractor & mound/bank former				
Planting preparation machinery costs					
	pH adjust sulfur contract spread	apply	1	\$1,066.00	\$1,066.00
	Rotary hoe sulfur (FORM)	hours	8	\$44.00	\$352.00
	Rotary hoe labour (2 people)	hours	16	\$22.00	\$352.00
	Bed mounding (labour)	hours	40	\$22.00	\$880.00
	Bed mounding (FORM)	hours	20	\$44.00	\$880.00
	Compost	m ³	60	\$30.00	\$1,800.00
	Labour for compost	hours	26	\$22.00	\$572.00
	Machinery for compost (FORM)	hours	13	\$44.00	\$572.00
	Hardwood mulch	m ³	60	\$30.00	\$1,800.00
	Vermin proof fencing	m	500	\$16.00	\$8,000.00
Planting costs					
	Plants (each) 2000/ha (5 inch pot)	each	2,000	\$5.50	\$11,000.00
	Replacement plants (5%)	each	100	\$5.50	\$550.00
	Planting labour (4 people 2 mins/plant)	hours	67	\$22.00	\$1,474.00
	Replacement labour (2 mins/plant)	hours	3.4	\$22.00	\$74.80
	Cutting and marking holes for plants (2 people)	hours	18	\$22.00	\$396.00
Irrigation costs					
	Steel posts wire and cross members		320	\$16.00	\$5,120.00
	Pressure comp. drip line above bed	m	3,000	\$0.70	\$2,100.00
	Labour for irrigation installation (2 people)	hours	32	\$22.00	\$704.00
Netting costs					
	Poles, cables, bedlogs, bird netting	m ²	10,000	\$4.00	\$40,000.00
				subtotal	\$79,309.25
New packing facilities					
	Packing shed (for 4 ha blueberries)				\$100,000.00
	Coolroom				\$50,000.00
	Air cond.				\$4,400.00
	Scales, tables				\$3,000.00
	Manual packing line				\$50,000.00
Total land preparation and establishment cost					\$286,709.25

Blueberry gross margin for 1 ha, based on a 4 ha blueberry orchard in southern Australia with 4 year-old bushes. Yield is estimated at 4 kg per plant.

Description	Operation	Number	Units	Units/ ha	Unit cost\$	Standard budget \$/ha	Your budget \$/ha
Income (A) sale of fruit		4706	trays		\$28.00	\$131,765	
Machinery operation (labour)							
	Mowing / slashing	10	hours	2	\$22.00	\$440.00	
	Pesticide application	12	hours	2	\$22.00	\$528.00	
	Fungicide application	10	hours	2	\$22.00	\$440.00	
	Herbicide application	4	hours	2	\$22.00	\$176.00	
	Weeding plant holes	3	hours	8	\$22.00	\$528.00	
	Machinery/pump maintenance	11	days	7	\$22.00	\$1694.00	
	Mulch prunings	2	hours	2	\$22.00	\$88.00	
Machinery (fuel, oil, repairs & maintenance) FORM							
	57–66 kW (77–90 HP) tractor/slasher and spray		hours	25	\$44.00	\$1,100.00	
Fertigation (25 kg bags)							
	Liquifert MAP	52	kg	5	\$1.89	\$491.40	
	Pinnacle (ammonium nitrate)	52	kg	2	\$0.88	\$91.52	
	Liquifert K spray	52	kg	2.5	\$1.50	\$195.00	
	Solubor	52	kg	0.05	\$4.34	\$11.28	
	Zinc sulfate	52	kg	0.065	\$1.81	\$6.12	
	Iron sulfate	52	kg	0.125	\$1.25	\$8.13	
	Magnesium sulfate	52	kg	2	\$1.15	\$119.60	
	Copper sulfate	52	kg	0.075	\$1.19	\$4.64	
	Manganese sulfate	52	kg	0.01	\$0.70	\$0.36	
	Calcium nitrate	26	kg	3	\$0.90	\$70.20	
	Leaf test	1	kit	1	\$120.00	\$120.00	
	Soil test	1	kit	1	\$120.00	\$120.00	
Plant protection (chemical costs)							
Insect control							
	Cockchafer beetle / Scarab beetle (Suscon Blue, Diazol 800 EC)	1	kg	11	\$ 13.00	\$ 143.00	
	Aphids (Aphidex 500)	1	kg	0.3	\$ 53.24	\$ 15.97	
	WFT (Spinosad)	1	litres	0.48	\$ 192.50	\$ 92.40	
	Lightbrown apple moth (Success)	2	litres	0.48	\$ 192.50	\$ 184.80	
Disease control (fungicides)							
	Rust fungicide (Mancozeb)	12	kg	2	\$9.68	\$232.32	
	Rust fungicide (Bravo, Tilt 250EC)	5	litres	0.192	\$48.26	\$46.33	
	Phytophthora (Ridomil Gold)	1	kg	1	\$147.30	\$147.30	
	Anthrachnose Rust (Captan, Euparen)	5	kg	0.75	\$17.50	\$65.63	
Pruning costs	Detail pruning & thinning	1	hours	185	\$22.00	\$4,070.00	
Weed control							
	Glyphosate	4	litres	4	\$11.30	\$180.80	
	Basta	2	litres	1.5	\$19.90	\$59.70	
	Hardwood woodchip mulch	1	annual		\$1,350.00	\$1,350.00	
Harvesting and packing	Picking & packing (incl. field sort)	1	tray	4,706	\$14.31	\$67,341.18	
Packing material costs							
	Punnets (125 g)	1	punnet	56,471	\$0.20	\$11,298.12	
	Trays (12 punnets)	1	tray	4,706	\$0.89	\$4,188.24	
Irrigation costs							
			ML	3	\$26.00	\$78.00	
Transport costs	Freight (248 trays/pallet)	1	tray	4706	\$0.70	\$3,294.12	
Commission and levies 12%	Sydney, Brisbane, Melbourne					\$15,811.76	
Total variable costs (B)						\$114,827.91	
Cost per tray (12 punnets)						\$24.40	
Gross margin (A–B)						\$16,936.80	

Sensitivity analysis for blueberries in southern Australia – effect of yield and price on gross margin/ha

Yield trays/ha	Crop price (\$/tray of 12 punnets)							
	\$20.00	\$25	\$30.00	\$35.00	\$40.00	\$45.00	\$50.00	\$60.00
2000	-\$ 74,827.91	-\$ 64,827.91	-\$ 54,827.91	-\$ 44,827.91	-\$ 34,827.91	-\$ 24,827.91	-\$ 14,827.91	\$ 5,172.09
3000	-\$ 54,827.91	-\$ 39,827.91	-\$ 24,827.91	-\$ 9,827.91	\$ 5,172.09	\$ 20,172.09	\$ 35,172.09	\$ 65,172.09
4000	-\$ 34,827.91	-\$ 14,827.91	\$ 5,172.09	\$ 25,172.09	\$ 45,172.09	\$ 65,172.09	\$ 85,172.09	\$ 125,172.09
5000	-\$ 14,827.91	\$ 10,172.09	\$ 35,172.09	\$ 60,172.09	\$ 85,172.09	\$ 110,172.09	\$ 135,172.09	\$ 185,172.09
6000	\$ 5,172.09	\$ 35,172.09	\$ 65,172.09	\$ 95,172.09	\$ 125,172.09	\$ 155,172.09	\$ 185,172.09	\$ 245,172.09
7000	\$ 25,172.09	\$ 60,172.09	\$ 95,172.09	\$ 130,172.09	\$ 165,172.09	\$ 200,172.09	\$ 235,172.09	\$ 305,172.09
8000	\$ 45,172.09	\$ 85,172.09	\$ 125,172.09	\$ 165,172.09	\$ 205,172.09	\$ 245,172.09	\$ 285,172.09	\$ 365,172.09

Cost summary / hectare / year – southern Australia

Cost summary	Total	Cost/tray (12)	% Cost
Irrigation	\$ 78.00	\$ 0.02	0.1%
Disease control fungicides	\$ 491.57	\$ 0.10	0.4%
Insect control insecticides	\$ 436.17	\$ 0.09	0.4%
Weed control herbicides	\$ 1,590.50	\$ 0.34	1.4%
Nutrition	\$ 1,238.25	\$ 0.26	1.1%
Pruning & thinning	\$ 4,070.00	\$ 0.86	3.5%
Machinery	\$ 4,994.00	\$ 1.06	4.3%
Marketing	\$ 19,105.88	\$ 4.06	16.6%
Packing materials	\$ 15,482.35	\$ 3.29	13.5%
Picking & packing	\$ 67,341.18	\$ 14.31	58.6%
Total	\$ 114,827.91	\$ 24.40	100.00%

TABLES FOR NORTHERN NSW

Blueberry establishment costs

Blueberry establishment costs	Operation	Unit	Units/ha	Unit cost	Total cost
Site establishment costs				\$/unit	\$/ha
Ground preparation machinery costs 77–90 HP (57–66 kW) tractor					
Fuel, oil, repairs, maintenance (FORM)	Herbicide application (FORM)	hours	2	\$44.00	\$88.00
	Herbicide cost	litres	4	\$11.30	\$45.20
	Herbicide labour	hours	2	\$22.00	\$44.00
	Deep ripping + plough (FORM)	hours	7	\$44.00	\$308.00
	Deep ripping labour	hours	7	\$22.00	\$154.00
	Sow green manure crop (FORM)	hours	1.5	\$44.00	\$66.00
	Green manure seed cost	kg	25	\$1.85	\$46.25
	Fertilise green manure	kg	100	\$0.40	\$40.00
	Labour for green manure fertiliser	hours	1.5	\$22.00	\$33.00
	Mark out rows	hours	4	\$22.00	\$88.00
	Rotary hoe rows (FORM)	hours	5	\$44.00	\$220.00
	Rotary hoe labour	hours	5	\$22.00	\$110.00
	– 125 HP (93 kW) tractor & mound/bank former				
Planting preparation machinery costs					
	Mounding (labour)	hours	35	\$22.00	\$770.00
	Weedmat laying & mounding (FORM)	hours	16	\$44.00	\$704.00
	Irrigation T tape (400 m roll)	m	6,600	\$261.00	\$4,306.50
	Weedmat cost (1800 mm wide) 50 m roll (OR hardwood mulch)	m	3,300	\$0.90	\$2,970.00
				\$1,800.00	\$1,800.00)
Planting costs					
	Plants (each) 3700/ha (5 inch pot)	each	3,700	\$5.50	\$20,350.00
	Replacement plants (5%)	each	185	\$5.50	\$1,017.50
	Planting labour (4 people 2 mins/plant)	hours	124	\$22.00	\$2,728.00
	Replacement labour (2 mins/plant)	hours	6.17	\$22.00	\$135.74
	Cutting and marking holes for plants (2 people)	hours	18	\$22.00	\$396.00
Netting costs					
	Poles, cables, bedlogs, bird netting	m ²	10,000.00	\$4.00	\$40,000.00
				subtotal	\$76,420.19
New packing facilities					
	packing shed				\$100,000.00
	coolroom				\$50,000.00
	air cond.				\$4,400.00
	scales, tables				\$3,000.00
	packing line				\$50,000.00
Total land preparation and establishment cost					\$283,820.19

Blueberry gross margin for 1 ha, based on a 4 ha blueberry orchard in northern NSW with 4 year-old bushes. Yield is estimated at 2 kg per plant.

Description	Operation	Number	Units	Units/ha	Unit cost\$	Standard budget \$/ha	Your budget \$/ha
Income (A) sale of fruit		4353		trays	\$30.00	\$130,588	
Machinery Operation	(labour)						
	mowing slashing	10	hours	2	\$22.00	\$440.00	
	pesticide application	12	hours	2	\$22.00	\$528.00	
	fungicide application	10	hours	2	\$22.00	\$440.00	
	herbicide application	4	hours	2	\$22.00	\$176.00	
	weeding plant holes	3	hours	8	\$22.00	\$528.00	
	machinery/pump maintenance	11	days	7	\$22.00	\$1,694.00	
	mulch prunings	2	hours	2	\$22.00	\$88.00	
Machinery (fuel oil repairs & maintenance) FORM							
	77–90 HP tractor/slasher and spray		hours	25	\$44.00	\$1,100.00	
Fertigation (25 kg bags)	Liquifert MAP	52	kg	5	\$1.89	\$491.40	
	Pinnacle (ammonium nitrate)	52	kg	2	\$0.88	\$91.52	
	Liquifert K spray	52	kg	2.5	\$1.50	\$195.00	
	Solubor	52	kg	0.05	\$4.34	\$11.28	
	Zinc sulfate	52	kg	0.065	\$1.81	\$6.12	
	Iron sulfate	52	kg	0.125	\$1.25	\$8.13	
	Magnesium sulfate	52	kg	2	\$1.15	\$119.60	
	Copper sulfate	52	kg	0.075	\$1.19	\$4.64	
	Manganese sulfate	52	kg	0.01	\$0.70	\$0.36	
	Calcium nitrate	26	kg	3	\$0.90	\$70.20	
	leaf test	1	kit	1	\$120.00	\$120.00	
	soil test	1	kit	1	\$120.00	\$120.00	
Plant protection (chemical costs)							
Insect control	Qfly (Dimethoate)	12	litres	0.75	\$12.02	\$108.18	
	Scarab (Suscon Blue, Diazol 800 EC)	1	kg	11	\$13.00	\$143.00	
	Aphids (Aphidex 500)	1	kg	0.3	\$53.24	\$15.97	
	Heliothis (Lannate)	1	litres	0.6	\$16.04	\$9.62	
	leaf roller (Lannate)	1	litres	0.6	\$16.04	\$9.62	
	Monolepta (Lannate)	1	litres	0.6	\$16.04	\$9.62	
	Scale (white petroleum oil)	1	litres	10.2	\$3.65	\$37.23	
	Red spider mites(dimethoate)	1	litres	0.8	\$12.02	\$2.92	
	Plague thrips (Lannate, Endo)	1	litres	0.6	\$16.04	\$9.62	
	WFT (Spinosad)	1	litres	0.48	\$192.50	\$92.40	
	Lightbrown apple moth (Success)	2	litres	0.48	\$192.50	\$184.80	
Disease control (fungicides)	Rust fungicide (Mancozeb)	12	kg	2	\$9.68	\$232.32	
	Rust fungicide (Bravo, Tilt 250EC)	5	litres	0.192	\$48.26	\$46.33	
	Phytophthora (Ridomil Gold)	1	kg	1	\$147.30	\$147.30	
	Anthracoze rust (Euparen, Captan)	5	kg	0.75	\$17.50	\$65.63	
Pruning costs	Detail pruning & thinning	1	hours	185	\$22.00	\$4,070.00	
Weed control	Glyphosate	4	litres	4	\$11.30	\$180.80	
	Basta	2	litres	1.5	\$19.90	\$59.70	
	Hardwood woodchip mulch	1	annual		\$1,350.00	\$1,350.00	
Harvesting and packing	picking & packing (incl. field sort)	1	tray	4,353	\$14.31	\$62,290.59	
Packing materials	punnets (125 g)	1	punnet	52,235	\$0.20	\$10,447.06	
	trays (12 punnets)	1	tray	4,353	\$0.89	\$3,874.12	
Irrigation costs	1 ha		ML	3	\$26.00	\$78.00	
transport costs	Freight (248 trays/pallet)	1	tray	4353	\$0.70	\$3,047.06	
Commission and levies 12%	Sydney, Brisbane, Melbourne					\$15,670.59	
Total Variable costs (B)						\$108,414.74	
Cost per tray (12 punnets)						\$24.91	
Gross margin (A–B)						\$22,173.50	

Sensitivity analysis for blueberries in northern NSW – effect of yield and price on gross margin/ha

Yield trays/ha	Crop price (\$/tray of 12 punnets)															
		\$20.00		\$25.00		\$30.00		\$35.00		\$40.00		\$45.00		\$50.00		\$60.00
2000	-\$	68,414.74	-\$	58,414.74	-\$	48,414.74	-\$	38,414.74	-\$	28,414.74	-\$	18,414.74	-\$	8,414.74	\$	11,585.26
3000	-\$	48,414.74	-\$	33,414.74	-\$	18,414.74	-\$	3,414.74	\$	11,585.26	\$	26,585.26	\$	41,585.26	\$	71,585.26
4000	-\$	28,414.74	-\$	8,414.74	\$	11,585.26	\$	31,585.26	\$	51,585.26	\$	71,585.26	\$	91,585.26	\$	131,585.26
5000	-\$	8,414.74	\$	16,585.26	\$	41,585.26	\$	66,585.26	\$	91,585.26	\$	116,585.26	\$	141,585.26	\$	191,585.26
6000	\$	11,585.26	\$	41,585.26	\$	71,585.26	\$	101,585.26	\$	131,585.26	\$	161,585.26	\$	191,585.26	\$	251,585.26
7000	\$	31,585.26	\$	66,585.26	\$	101,585.26	\$	136,585.26	\$	171,585.26	\$	206,585.26	\$	241,585.26	\$	311,585.26
8000	\$	51,585.26	\$	91,585.26	\$	131,585.26	\$	171,585.26	\$	211,585.26	\$	251,585.26	\$	291,585.26	\$	371,585.26

Cost summary/hectare/year – northern NSW

Cost summary	Total	Cost/tray (12)	% Cost
Irrigation	\$ 78.00	\$ 0.02	0.1%
Disease control fungicides	\$ 491.57	\$ 0.11	0.5%
Insect control insecticides	\$ 623.00	\$ 0.14	0.6%
Weed control herbicides	\$ 1,590.50	\$ 0.37	1.5%
Nutrition	\$ 1,238.25	\$ 0.28	1.1%
Pruning & thinning	\$ 4,070.00	\$ 0.94	3.8%
Machinery	\$ 4,994.00	\$ 1.15	4.6%
Marketing	\$ 18,717.65	\$ 4.30	17.3%
Packing materials	\$ 14,321.18	\$ 3.29	13.2%
Picking & Packing	\$ 62,290.59	\$ 14.31	57.5%
Total	\$ 108,414.74	\$ 24.91	100.00%