



PLANNING FOR PROFIT



Ministry of Agriculture,
Food, & Fisheries

Transition To Certified Organic Apple Production - Southern Interior 20 Acre Farm

Winter 2002

This information is provided as a tool for projecting costs and returns for B.C. farm enterprises interested in certified organic apple production. The sample budget should be used as a guide only and should not be used for business analyses without adjustments to reflect individual situations. Each farm should develop their own budget to reflect their production goals, costs and market prices.

Information regarding financial planning and other enterprise budgets may be downloaded from the internet at B.C. Ministry of Agriculture, Food and Fisheries. Web (<http://www.agf.gov.bc.ca/busmgmt/>).

Key Success Factors

- High level of horticultural training and skills to ensure effective management of insects, weeds, diseases and fertility.
- Good site selection and preparation.
- Preplanning for yield and size variations associated with biennial production.
- Research varieties and make choices based on market returns, yield potentials, growth requirements, planting site and input costs. Higher density plantings of 1200-2000 trees/acre will optimize yield potentials and net returns.
- Identify your market prior to making any production changes.
- Reduce direct and indirect expenses as much as possible.

Market

Conventional

- Most growers in the Okanagan Valley belong to local Packinghouse cooperatives. Marketing is done through B.C. Tree Fruits. Only fresh market apples graded as Fancy or better provide a worthwhile price return. Commercial grade apples return on average \$0.04/lb or lower and cull grade apples return a negative price (ie.cost) to the grower.
- The market for apples is influenced by global supply and demand. Current world supply is in a surplus. The demand for traditional apple varieties is losing favour to the newer apple varieties.
- The potential for direct marketing is limited, although price returns per pound are generally greater than returns from packinghouses.

Certified Organic

- Many organic growers market through smaller independent packinghouses, with the fruit being sold to Canadian, U.S. and European markets. Only fresh market apples graded as Fancy or better provide a worthwhile price return. Commercial or cull grades provide either very poor or negative price returns.
- Wholesaled apples produced during the 3 year transition period are generally not paid any price premiums and in some instances, returns are poorer than for conventional apples. Some exceptions exist for some of the newest varieties, such as Pink Lady, Ambrosia, and Honeycrisp.
- There is a limited potential for direct marketing from the farmgate, farmers markets', restaurants or produce stands -
- Producers of organic apples are required to be certified. A13A list of COABC accredited certifying bodies is available from the Certified Organic Association of B.C. (see References)

Risk Factors and Strategies

Financial Risks -Capital investment in equipment, land, irrigation systems, trees and support systems is substantial for all production systems. With certified organic production additional capital investment is required for compost application and mechanical weeding. Higher labour requirements also increase the financial risk of certified organic apple orcharding. Equipment sharing or renting, contracting out certain jobs, leasing land, and replants grants can help offset the financial risk.

Production Risks - Insect,weed, and disease control along with effective fertility management are essential elements in ensuring high quality and high yields. These elements may pose major challenges to organic growers, as they switch from conventional production, since new techniques of control must be learned and biological systems require balancing. Organic insect control measures are available, such as mating disruption for codling moth and predator species for aphids. The degree of control is affected by such things as: overall pest pressure; location of the orchard; gaps between pest and predator population peaks(ie.predators need time to build up and balance); temperature, which affects feeding and hatching (ie.different temperature threshold for pest and predator); and ant populations, that tend to feed on predatory species while collecting the nectar of the aphids. Other insects that may not have been a problem for a conventional orchard may creep in from time to time and at times cause substantial losses. In general, many insect pests can be managed with biological controls or organic sprays. Insect damage can have adverse effects on fruit size, yield and tree growth of young trees, further reducing yield potential in subsequent years.

Diseases such as scab and powdery mildew in organic orchards can be well controlled organically in arid climates but in the moister regions of the North Okanagan, control is more difficult. In addition the total number of scab and mildew sprays may be more more frequent than for conventional orchards since the period of effectiveness is shorter for organic sprays than most conventionally applied sprays. Organic growers must also adopt a preventative scab program since there are no effective erradicant organic fungicides available.

Weeds are a constant battle on organic orchards, with control measures restricted to mechanical cultivation and manual removal. Weed control is especially vital in young plantings.

In organic production, soil fertility can be well managed by adding composts and planting legume species in the alleys between the tree rows. Foliar sprays can provide supplemental nutrients. Organic growers are restricted in foliar nitrogen sprays to such products as soluble fish fertilizers and kelp. Nutrient sprays, for zinc, boron, magnesium, and calcium are the same in conventional and organic production.

Some growers have found that weeds and fertility can be more of a problem in the second year of transition. Herbicide and fertilizer residues from the previous conventional farming practices may impart some measure of control during the first year of transition.

Biennial production is more of a problem in organic than conventional orchards. Without the ability to use blossom and fruit thinning sprays, organic growers are mainly restricted to hand thinning. Poorly timed fruit thinning and a lack of blossom thinning throws a tree into a biennial production cycle, with a low production year followed by a high

production year. In high production years, average fruit size tend to be smaller (resulting in lower \$/lb returns),while in low production years, average fruit size tends to be larger. Excessively large fruit also yields lower returns.

Adverse weather such as excess precipitation, excess heat, or hail can negatively impact marketable yields in both organic and conventional production. Increased disease pressure, sunburn, poor colour development, and marked fruit are some symptoms of adverse weather.

An effective irrigation program is also essential to both conventional and organic apple production.

Effort and time directed towards gaining a high level of horticultural knowledge and skill in both conventional and organic orcharding are essential in offsetting production risks. Remember to allow time to make mistakes and to learn new production techniques when switching from conventional to organic farming.

Programs available to offset production risks include NISA, crop insurance and whole farm insurance.

Handling Risks - Ensure crop is properly harvested and shipped to optimize marketable yields. Direct to consumer sales will require you to have a cooler. Handlings risks are generally the same for conventional and organic production.

Price and Market Risks - Fluctuations in prices which are influenced by the global marketplace are a major risk factor. Growers must be very conservative in assessing price returns when establishing financial plans. Make sure factors such as total production acreages, the biennial cycle, market demand and buyer profiles are considered when making price predictions. The consolidation of organic markets and increasing organic production acreages has led to a general decline in the overall price for organic apples. Conventional apple prices, primarily due to oversupply, have also been at all time lows in the past few years, although the newer varieties still provide better returns than the older varieties.

Generally, larger apples, in the 80 to 88 size category provide better returns than smaller apples. Be always vigilant of demand and supply factors. Currently, organic demand is up, but total organic production acreage is also up.

Sample Enterprise Budget and Worksheet

Transition to Certified Organic Apple Production - Southern Interior

The sample enterprise budget provided should be viewed as a first approximation only. Use the column "Your Farm" to add, delete, and adjust items to reflect your specific production situation and level of knowledge, skills, and experience. The budget is based on one acre of production for a 20 acre farm.

Projected Income	Conventional	TransitionCertified Organic.....		
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Price (\$/lb)	\$0.23	\$0.23	\$0.23	\$0.23	\$0.40	\$0.40	\$0.40
Total Yield	33600	28000	29600	32000	32000	32000	32000
Marketable Yield(>FCY)	28560	19600	22200	25600	27200	27200	27200
Projected Income	\$6,569	\$4,508	\$5,106	\$5,888	\$10,880	\$10,880	\$10,880

Projected Direct Exp

Labour	Conventional	TransitionCertified Organic.....		
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
.remove mildew infect		\$40	\$40	\$40	\$40	\$40	\$40
.band/isomate install		\$170	\$170	\$170	\$170	\$170	\$170
.hand weeding		\$200	\$200	\$200	\$200	\$200	\$200
.thinning (blossom/fruit)	\$420	\$1,470	\$1,554	\$1,680	\$1,680	\$1,680	\$1,680
.picking	\$630	\$525	\$555	\$600	\$600	\$600	\$600
.WCB&benefits(14.42%)	\$151	\$347	\$363	\$388	\$388	\$388	\$388
<i>Total labour costs</i>	\$1,201	\$2,752	\$2,882	\$3,078	\$3,078	\$3,078	\$3,078
Fertilizer							
.34-0-0(kg)	\$42						
.foliar nutrients	\$75	\$71	\$71	\$71	\$71	\$71	\$71
.compost		\$411	\$411	\$411	\$411	\$411	\$411
Pesticides							
.rodent bait	\$14						
.herbicides	\$93						
.insecticides	\$168	\$294	\$294	\$294	\$294	\$294	\$294
.fungicides	\$177	\$68	\$68	\$68	\$68	\$68	\$68
Thinning Sprays	\$34						
Hive Rental	\$50	\$50	\$50	\$50	\$50	\$50	\$50
Other	\$35	\$35	\$35	\$35	\$35	\$35	\$35
Farm Monitoring							
Hauling	\$163	\$136	\$144	\$156	\$156	\$156	\$156
Shipping					\$2,040	\$2,040	\$2,040
Crop Insurance	\$75	\$75	\$75	\$75	\$75	\$75	\$75
Irrigation Fees	\$55	\$55	\$55	\$55	\$55	\$55	\$55
Certification Fees		\$40	\$40	\$40	\$40	\$40	\$40
Tractor fuel	\$66	\$129	\$130	\$131	\$131	\$131	\$131
Tractor oil&lube	\$10	\$19	\$19	\$20	\$20	\$20	\$20
Repair & Maint.	\$326	\$338	-\$311	-\$323	-\$323	-\$323	-\$323
Total	\$2,584	\$4,482	\$3,963	\$4,160	\$6,200	\$6,200	\$6,200

Income-dir. expenses	\$3,985	\$26	\$1,143	\$1,728	\$4,680	\$4,680	\$4,680
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Projected Indirect Expenses

Depreciation
Interest
Insurance
Administration
Legal/accounting

Other
 Total

Indirect expenses do not vary with the level of output and are typically associated with inputs used in more than one enterprise. These expenses must be allocated appropriately (prorated) between uses.

Projected Net Income Projected Income
minus Projected Direct & Indirect Expenses
Projected Net Income

Sensitivity Analysis

The profitability of both conventional and organic apple operations are influenced by market prices and yield. The table below illustrates the changes to income less direct expenses as prices and yield vary.

Conventional

Price vs. Income-Direct Expenses	50% Target Price	75% Target Price	Target Price	115% Target Price	125% Target Price
Price (\$/lb)	\$0.12	\$0.17	\$0.23	\$0.26	\$0.29
Income-Direct Expenses	\$1,307	\$2,646	\$3,985	\$4,788	\$5,324

Yield vs. Income-Direct Expenses	75% Target Yield	85% Target Yield	Target Yield	115% Target Yield	125% Target Yield
Yield (lbs)	21,420	24,276	28,560	32,844	34,272
Income-Direct Expenses	\$2,646	\$3,182	\$3,985	\$4,788	\$5,324

Certified Organic

Price vs. Income-Direct Expenses	50% Target Price	75% Target Price	Target Price	115% Target Price	125% Target Price
Price (\$/lb)	\$0.20	\$0.30	\$0.40	\$0.46	\$0.50
Income-Direct Expenses	\$1,478	\$3,079	\$4,680	\$5,641	\$6,281

Yield vs. Income-Direct Expenses	75% Target Yield	85% Target Yield	Target Yield	115% Target Yield	125% Target Yield
Yield (lbs)	20,400	23,120	27,200	31,280	34,000
Income-Direct Expenses	\$3,079	\$3,720	\$4,680	\$5,641	\$6,281

Cash Flow Timing

The tables below indicates the monthly flow of income and direct expenses. After harvest, apples are shipped to a local packinghouse, put into storage, and packed and shipped according to market demands, fruit quality, etc. A complete projected cash flow should include indirect expenses, capital sales and purchases, loans and personal expense

Conventional	J	F	M	A	M	J	J	A	S	O	N	D
% Income		40		15		10		5		30		
% Expenses			20	15		10	25	5			25	

Certified Organic	J	F	M	A	M	J	J	A	S	O	N	D
% Income	13	13		13	13		13	5		10		10
% Expenses				8	10		20	40		6		16

Investment Capital Replacement Costs - Conventional vs. Organic Production

Item	Conventional	Cert.Organic	Net Change*
Buildings	\$40,000	\$40,000	\$0
Implements			
.tillers,blade,mower	\$11,500	\$11,500	\$0
.sprayers	\$17,500	\$15,000	-\$2,500
.loader&attachments	\$7,000	\$7,000	\$0
.bin lifters	\$1,000	\$1,000	\$0
.fertilizer spreader	\$2,500		-\$2,500
.manure spreader		\$6,000	\$6,000
.cultivator/weeder		\$7,000	\$7,000
Tractor(s)	\$50,000	\$50,000	\$0
ATV	\$8,000	\$8,000	\$0
Supplies (bins, boxes, etc.)	\$1,000	\$1,000	\$0
Small tools and equip.	\$8,500	\$8,500	\$0
Irrigation	\$45,000	\$45,000	\$0
Vehicle (s)	\$25,000	\$25,000	\$0
Trees/support system	\$215,596	\$215,596	\$0
Total	\$432,596	\$440,596	\$8,000

*change in investment capital between conventional and organic production

Hours of Labour Required - Conventional vs. Organic Production

Task Completed	Conventional	Transition			Certified		
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
compost application		3.5	3.5	3.5	3.5	3.5	3.5
remove mildew infections		4	4	4	4	4	4
banding/isomate install		17	17	17	17	17	17
herbicide spraying	2.25						
Ground fertilizer application	0.25						
Tree Spraying	6	5	5	5	5	5	5
Thinning	42	147	155.4	168	168	168	168
Hand weeding		20	20	20	20	20	20
Mechanical weeding		14	14	14	14	14	14
Mowing	3	5	5	6.25	6.25	6.25	6.25
Picking	63	52.5	55.5	60	60	60	60
Yarding bins	4.2	3.5	3.7	4	4	4	4
Total Labour	120.7	271.5	283.1	301.75	301.75	301.75	301.75

Conventional vs. Certified Organic Apple Production: Factors Affecting Production Costs

1. Labour: Labour requirements are considerably higher with certified organic than conventional apple production. More labour is needed for thinning and pest management, since spray options are limited. More time is required for nutrient (ie.compost) application and mowing, since the growth in the alleys between trees rows tends to be wider in organic orchards (ie.no herbicide band adjacent to trees) and mowing speed is reduced because operator has to get closer to the trees.

2.Equipment: Investment in equipment is somewhat higher in certified organic operations as a mechanical weeder and a manure/compost spreader is needed. Fertilizer spreaders and herbicide sprayers are not required on organic orchards, but the cost of these items is generally lower than the cost of weeders and manure spreaders. Renting or contracting jobs out will help offset costs associated with equipment purchases for both production systems.

3. Pest control: Options for pest control in certified organic apple production are entail biological control, approved organic sprays and manual control. Making the switch requires a degree of effort and time in learning the new technology. During the learning period, producers may face greater challenges in attaining yield, quality and size targets. The degree of challenge will depend on personal horticultural skills, practices in place prior to making the transition, pest pressures, location, and so on. Organic producers can offset the production risks by moving slowly and gradually switching the farm over to organic production. While still farming conventionally, begin to adjust farming practices to include some of the organic approved sprays and biological controls. This will not only provide you time to learn the system, but it will help to initiate the balancing of biological systems prior to fully adopting organic orcharding practices.

5. Certification fees: To maintain certified organic status, a farm must be registered with a certified organic or recognized association and have semi-annual audits completed of all farming practices. The fee rates vary widely from farm to farm and depend on the certifying body, the level of production, and the time required to complete audits.

6. Yield, Quality and Size: The transition period will see the greatest variability in yield, quality and size. Pest damage and imbalances in nutrition will cause yields and size to drop and result in a greater amount of culled fruit. As growers become more familiar with organic farming practices, yield, quality and size will begin to rebound.

In this budget it is assumed that biennial production is a factor and certified organic yields are 5% lower than yield in conventional systems. Under good management conditions, with optimum blossom and fruit thinning, biennial production is not a factor with most varieties. However, the organic apple industry as a whole is affected by biennial production fluctuations. If biennial production does occur in an orchard, there will probably be subsequent variations in apple size pack-outs. In high production years, apple size will be smaller, while in low production years, apple size will generally be larger. Again, effective fruit thinning can minimize size variations in the high production years.

Tree vigor as affected by pest damage or poor nutrition must also be considered. Mite and aphid outbreaks, for instance, can interfere with tree growth and vigor and ultimately affect the next year's crop. Poor vigor is especially problematic in young plantings, where inconsistent growth can increase the number of years to full production. Tree vigor concerns are an issue on both conventional and organic systems, but the issue is that if a grower is not equipped with a high enough level of skills and knowledge of organic pest control and nutrition, growth and health of the tree can suffer during the transition period of learning.

7. Marketing: When making business plans and predictions on price returns, the type of market (ie. indirect wholesale or direct retail/wholesale), location of market and costs associated with that market need to be considered. This sample budget assumed additional shipping costs for certified organic apples at \$0.075/lb. This amount will vary according to the packinghouse/broker, location of packinghouse, and the final destination of the fruit. Often grower returns are already adjusted for shipping costs.

If direct marketing, additional labour and packaging costs need to be considered, although prices tend to be higher than indirect wholesale marketing. Overall, organic production will require more time and effort for marketing than for conventional apple production, where growers ship to local packinghouse. The amount of time required for marketing is highly variable and therefore not accounted for in this sample budget.

8. Land Needs: The total land required for a certified organic orchard may be higher than for conventional orchards due to the potential requirement for buffer zones. If there is a concern that contamination from adjacent land, roadways, and so forth, could occur, then buffer zones need to be established. In addition, when replanting, a year of fallow may be necessary to reduce nematode and disease pressure.

References:

- COABC - 2001 - B - C - Certified Organic Production Operation Policies and Farm Management Standards (<http://www.certifiedorganic.bc.ca/Standards>).
- BCMAFF - Tree Fruit Production Guide -
- Linda Edwards - 1998 - Organic Tree Fruit Management - Certified Organic Associations of B.C.
- BCMAFF - Planning for Profit: Organic Apples - Okanagan Valley - Slender Spindle -1210 Trees/acre - Summer 2001.
- BCMAFF - Planning for Profit: Super Spindle Apples (1742trees/acre) - Okanagan Valley - Summer 2001.
- BCMAFF - Nov - 1999 - Assessing the Economic Impact and Establishment Costs - of Replanting Orchards.
- Okanagan Valley Tree Fruit Authority.1996Horticultural Management for Slender Spindle and Super Spindle Orchards
- J - P - Reganold, J - D - Glover,P - K - Andrews,H - R - Hinman - April 19, 2001 - Sustainability of Three *Apple Production Systems - Nature* **410** pp.926-930.
- Environment Canada & Manitoba Agriculture - October 1992 - Getting Started in Organic Farming (<http://www.gks.com/library>).
- Certified Organic Associations of B.C. 8A - 100 Kalamalka Lake Rd - , Vernon, B.C. V1T 9G1 - (250) 260-4429) email: coabc@bcgrizzly.com.
- BC certified organic industry information available at [www - certifiedorganic.bc.ca](http://www.certifiedorganic.bc.ca).

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- Rochelle Eisen, RARE Enterprises, Summerland, B.C. (editorial comments and final edit)
- certified organic apple growers

Assumptions:

The following assumptions were made in calculating the sample budget:

1. Planting Information:

- Projected income and expenses are based on 1 acre of a mature planting of apples (no variety specified) for all production systems. Total farm size is 20 acres.
 - 0 - 5 inch caliper trees are planted 3 feet apart in twelve rows 12 feet apart (1210trees/acre) at a cost of \$7 - 79/tree -
 - Support system for all production systems consists of
- | | |
|--|-------------------|
| pressure treated posts every 25 feet; 156 x 8ft 3to4inch posts; \$3.15/post; | \$491.40 |
| pressure treated end posts; 24 x 10ft 4-5inch posts; \$7.25/post; | \$174.00 |
| 3 high tensile 12.5 guage wires; 3 x 3750ft rolls; \$78.50/roll. | \$235.50 |
| 36 wire tighteners x \$2.50/tightener and 3 x 1210 metal tree ties x \$0.10/tie; | \$453.00 |
| <i>support system total:</i> | <u>\$1,353.90</u> |

It is assumed that the orchard was conventional prior to becoming organic. If starting an organic orchard from scratch, then steel (\$9.50/post) or split cedar posts must be used instead of pressure treated posts.

2. Fertilizer and Pesticide Information:

a. Ground fertilizer and foliar nutrient applications/costs are assumed as follows:

<u>conventional:</u>	100kg of 34-0-0 (34kg/acre N);	\$0.42/kg	\$42.00 per acre
	16.2kg of 16% zinc sulphate;	\$1.90/kg	\$30.78 per acre
	2x 0.400L of Zinctrac;	\$10.80/l	\$8.64 per acre
	1 x 2.2kg of solubor;	\$2.20/kg	\$4.40 per acre
	3 x 8kg of magnesium sulphate;	\$0.67/kg	\$16.08 per acre
	2 x 2.1kg of urea;	\$0.70/kg	\$2.94 per acre
	1 x 3.6kg of 20-20-20;	\$2.12/kg	\$7.63 per acre
	1 x 4.2kg of calcium chloride;	\$1.14/kg	\$4.79 per acre
	total foliar nutrients		\$75.26 per acre
<u>organic:</u>	0.02 yd compost/tree x 1210trees;	\$17.00/yd	\$411.40 per acre
	16.2kg of 16% zinc sulphate;	\$1.90/kg	\$30.78 per acre
	1 x 2.2kg of solubor;	\$2.20/kg	\$4.84 per acre
	3 x 8kg of magnesium sulphate;	\$0.67/kg	\$16.08 per acre
	2 x 2.1kg of calcium chloride;	\$1.14/kg	\$4.79 per acre
	4 x 0.45kg sol. fish fertilizer(12%N);	\$5.30/kg	\$9.54 per acre
	4 x 0.056kg soluble kelp;	\$22.00/kg	\$4.93 per acre
		total foliar nutrients	

b. Pesticide applications are assumed as follows:

<u>conventional:</u>	1 x 2kg rodent bait	\$7.07/kg	\$14.14 per acre	
	3 x 2.0l round-up;	\$10.05/l	\$60.30 per acre	
	1 x 1.68l prowl	\$12.62/l	\$21.20 per acre	
	1 x 0.75kg simazineDF	\$15.70/kg	\$11.78 per acre	
		total herbicides		\$93.28 per acre
	1 x 18.2l dormant oil	\$1.07/l	\$19.47 per acre	
	2 x 1.6l foray	\$26.80/l	\$85.76 per acre	
	1 x 0.91kg diazinon	\$21.76/kg	\$19.80 per acre	
	2 x 0.81l zolone	\$26.40/l	\$42.77 per acre	
		total insecticides		\$167.80 per acre
	1 x 1.6kg fixed copper	\$11.98/kg	\$19.17 per acre	
	4 x 2.4kg dithane	\$9.86/kg	\$94.66 per acre	
	2 x 0.14kg nova 40W	\$224.11/kg	\$62.75 per acre	
	total fungicides		\$176.57 per acre	
	1 x 1.6l ATS	\$0.87/l	\$1.39 per acre	
	1 x 1.8l sevin XLR	\$14.50/l	\$26.10 per acre	
	1 x 0.10kg NAA 5%	\$62.74/kg	\$6.27 per acre	
		total thinning sprays		\$33.77 per acre
<u>organic:</u>	1 x 18.2l dormant oil	\$1.07/l	\$19.47 per acre	
	2 x 0.7kg dipel 2X	\$71.96/kg	\$100.74 per acre	
	1 x 400 isomate C dispensers		\$173.80 per acre	
		total insecticides		\$294.02 per acre
	6 x 2.8kg kumulus 80DF	\$4.02/kg	\$67.54 per acre	
	total fungicides		\$67.54 per acre	

3. Marketing Information:

a. Costs

In this sample budget it is assumed that conventional and transitional apples are marketed through the same channels, namely the local packinghouse cooperative. Certified organic fruit is marketed through independent packing/brokerage house. Shipping costs for certified organic fruit are assumed at \$3.89/bin (bins in & out of packinghouse) plus \$0.075/lb for shipping of packed fruit. Bin hauling charges for conventional and transition fruit are assumed at \$3.89/bin. Shipping costs of packed conventional and transition fruit are worked into the price return to the grower and are not detailed as a separate cost in this budget.

b. Returns

- Total yields for conventional production are assumed at 42 bins/acre with 85% Fancy or better grades.
- Total yields for organic production are assumed at 35, 37 and 40 bins/acre with 70%, 75% and 80% Fancy or better for the 1st, 2nd and 3rd year of transition. Yields for the subsequent years of organic production are assumed at 40 bins per acre with 85% Fancy or better grades. Biennial production is not accounted for specifically, but rather the average final yield assumes an overall net yield reduction of 5% compared to conventional due to biennial highs and lows.
- Bin weight is assumed at 800lbs.
- Only Fancy or better grades receive a return - Therefore Marketable yields are calculated as % >Fancy x Total Yield -
- Returns for conventional, transition and certified organic apples are assumed at \$0.23/lb, \$0.23/lb and \$0.40/lb.

Note: these total yield and marketable yield assumptions are rough estimates but illustrate that the years of transition can be the most challenging. Yields and quality vary widely depending on previous farm practices, grower skills, location, weather, pest pressure, and so forth.

4. Certification Fees

Certification fees include membership fees for certifying body, Certified Organic Assoc. of B.C. (COABC) fees, certification fees, and farm inspection fees. These fees vary greatly according to the certifying body, the level of farm production and the time it takes to complete inspections. This budget assumes a total farm certification fee of \$800/year or \$40/acre for 20 acres of organic production. Certification fees for some farms can be as low as \$200/year.

5. Labour Requirements:

There *are no* differences with re: 2min/tree x 1210trees;

40.3 hrs/acre

.Pruning:

There *are* differences with respect to the following tasks between conventional, transition and certified organic.

- Compost application:	1 x 3.5hrs/acre	3.5 hrs/acre	transition & certified organic only
- Remove mildew infections:		4 hrs/acre	transition & certified organic only
Banding/Isomate install:		17 hrs/acre	transition & certified organic only
- Herbicide spraying:	3 x 0.75hr/acre	2.25 hrs/acre	conventional only
- Fertilizer application:	1 x 0.25hrs/acre	0.25 hrs/acre	conventional only
- Tree spraying:	12 x 0.5hr/acre	6 hrs/acre	conventional
	10 x 0.5hr/acre	5 hrs/acre	transition & certified organic
- Thinning:	42 bins; \$10/bin;\$10/hr;	42 hr/acre	conventional
	35 bins;\$42/bin;\$10/hr;	147 hr/acre	transition yr.1
	37 bins;\$42/bin;\$10/hr;	155.4 hrs/acre	transition yr.2
	40 bins;\$42/bin;\$10/hr;	168 hrs/acre	transition yr.3
	40 bins;\$42/bin;\$10/hr;	168 hrs/acre	certified organic
- Hand weeding:	1 x 20hrs/acre	20 hrs/acre	transition & certified organic
- Mechanical weeding:	4 x 3.5hrs/acre	14 hrs/acre	transition & certified organic
- Mowing:	5 x 0.75hrs/acre	3 hrs/acre	conventional
	5 x 1 - 25hrs/acre	5 hrs/acre	transition & certified organic
- Picking:	42 bins; 1.5hr/bin;	63 hrs/acre	conventional
	35 bins; 1.5hr/bin;	52.5 hrs/acre	transition yr.1
	37bins; 1.5hr/bin;	55.5 hrs/acre	transition yr.2
	40 bins; 1.5hr/bin;	60 hrs/acre	transition yr.3
	40 bins; 1.5hr/bin;	60 hrs/acre	certified organic
- Yarding bins:	42 bins; 10 bins/hr;	4.2 hrs/acre	conventional
	35 bins; 10 bins/hr;	3.5 hrs/acre	transition yr.1
	37 bins; 10 bins/hr;	3.7 hrs/acre	transition yr.2
	40 bins; 10 bins/hr;	4 hrs/acre	transition yr.3
	40 bins; 10 bins/hr;	4 hrs/acre	certified organic

Hired labour is paid at \$10/hr for all labour required for :removal of mildew infections; thinning; banding; hand weeding; picking.

6. Buildings/Equipment Costs:

a. Investment Capital

When switching from conventional to organic production, additional investment capital is required for compost application and weed cultivation. All capital investment costs assumed in this budget are outlined below:

	\$40,000.00	all production systems
- Buildings		
- Implements	\$4,000.00	all production systems
rotovator	\$500.00	all production systems
ripper	\$1,000.00	all production systems
blade	\$6,000.00	all production systems
mower	\$15,000.00	all production systems
sprayer	\$2,500.00	conventional only
weed sprayer	\$7,000.00	all production systems
loader & attachments	\$1,000.00	all production systems
2 bin lifters	\$2,500.00	conventional only
fertilizer spreader	\$6,000.00	transition & certified organic
manure spreader	\$7,000.00	transition & certified organic
cultivator/weeder	\$50,000.00	all production systems
- Tractor	\$8,000.00	all production systems
- ATV	\$1,000.00	all production systems
- Supplies (bins/boxes,etc -)	\$45,000.00	all production systems (\$2250/acre)
- Irrigation	\$8,500.00	all production systems
- Small Tools & Equip -	\$25,000.00	all production systems
- Vehicle (s)	\$215,596	all production systems
- Trees/support system		

b. Fuel Costs

- Tractor fuel costs are calculated by the no. of tractor hours x 8L/hr fuel consumption x \$0 .50/L fuel price.

The number of tractor hours assumed for all production systems ar Hours per Acre

Task	Convent'l	Transition			Certified Organic		
	Yr.0	Yr. 1	Yr.2	Yr.3	Yr.4	Yr.5	Yr.6
Task		3.5	3.5	3.5	3.5	3.5	3.5
compost application:		14	14	14	14	14	14
mechanical weeding:	0.25						
fertilizer application:	2.25						
herbicide spray:	6	5	5	5	5	5	5
tree spraying:	3.75	6.25	6.25	6.25	6.25	6.25	6.25
mowing:	4.2	3.5	3.7	4	4	4	4
yarding bins:	16.45	32.25	32.45	32.75	32.75	32.75	32.75
<i>Total</i>							

- Oil and lube costs are assumed at 15% of fuel costs.

- Repair and maintenance costs are calculated at 3% of investment capital replacement costs.