



PLANNING FOR PROFIT



Ministry of Agriculture,
Food, & Fisheries

Transition To Certified Organic Potatoes Production - North Okanagan 10 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 potato 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, such as varieties grown, growing region, grower skills, and so forth. Each farm should develop their own budget to reflect their own 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

- Effective weed, disease and insect control, in addition to a well managed soil fertility program.
- Adequate labour resources and skill base to implement the necessary pest control and fertility management programs.
- Good site selection and preparation.
- Appropriate timing of planting to optimize weed control measures and avoid adverse weather.
- Identify your market prior to planting and ensure access to organic storage if needed.
- Reduce direct and indirect expenses as much as possible.

Market

- The market for potatoes in Southern B.C. is regulated by the B.C. Vegetable Marketing Commission. A producer must obtain a Producer licence from the Commission and pay commission fees on all wholesaled product. For up to date information on licencing and fees growers should contact the B.C. Vegetable Marketing Commission (see References).

Conventional

- Production quota for conventionally produced potatoes is determined by the producers past delivery averages.
- Generally, washed, graded, and packed potatoes are delivered to a Commission Agency that has a licence to market potatoes. In the Lower Mainland, for instance, most of the conventionally produced potatoes are shipped to the Lower Mainland Vegetable Distributors, Inc.. From the marketing agency, potatoes are sold to the fresh table market or to processors. Market returns are variety and season dependent.

Certified Organic

- Certified organic potatoes are marketed in several ways. Potatoes can be directly retailed at farmers' markets or the farmgate and directly wholesaled to local produce outlets or restaurants.
- Certified Organic potatoes can also be indirectly wholesaled to organic produce distributors. The local market is a niche market. Producers with large volumes of organic potatoes can sell into the U.S. market, with returns near and sometimes lower than conventional potato prices.
- Potatoes produced during the 3 year transition period cannot be indirectly wholesaled to the organic produce distributors. These distributors will only accept certified organic produce. There is some potential for direct sales of transition product at premium prices (ie. equal or close to certified organic price) via farmgate or farmers' market sales, but this market is fairly small and requires additional labour to sell the product. If a direct market is not established for potatoes produced during the transition, then the conventional marketing channels can be used.
- As with conventional potatoes, returns are variety and season dependent -
- Producers of organic potatoes are required to be certified - A list of certifying bodies is available from the Certified Organic Association of B.C. (see References)

Risk Factors and Strategies

Financial Risks - Certified organic producers must generally assume more financial risk due to the need for washing, grading and packing equipment and cooler facilities. Producers may also need to purchase additional weed cultivation, cover crop seeding and compost application equipment. Capital investments in equipment can be offset by moving slowly and cautiously and purchasing used, sharing, or renting equipment.

Certified organic producers must also permit for buffer zones and crop rotation. This may increase the total farm acreage requirements in order to meet a set production acreage, and thereby increasing the land investment.

Production Risks - Disease, weed, and insect control along with effective fertility management are essential elements in ensuring high quality and high yields. Pest control can pose major challenges to organic growers. For instance, late blight, a major disease threat in potato production, may be controlled by fungicides. Conventional producers have a number of fungicide products to choose from, but certified organic producers can only use copper sprays, which are not very effective after continued use. In certified organic production, fertility may be well managed with composts, rotating with legume crops and the addition of products such as rock phosphate, elemental sulfur and and biodynamic preparations.

As with conventional production, certified organic growers must make variety selections based on individual climate, topography, and soil conditions. Certified organic growers in certified seed potato growing regions, for instance, are required to top plants early to control late blight. This will generally restricts production to nugget potatoes.

Adverse weather conditions, such as excess precipitation, can markedly reduce yield and quality due to increased disease pressure (ie. blight; rot). Disease control options are very limited in certified organic potato production and heavy rains are particularly devastating.

Disposal of diseased tubers and tops, cultivation of soil immediately following harvest, and crop rotation are important techniques, particularly in organic potato production, to help offset potential production losses. At planting, ensure that all seed potatoes are clean and visibly free of diseases.

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

Handling Risks - These are about the same in certified organic production as conventional production. In both systems, ensure crop is properly harvested, packaged, stored and shipped to optimize marketable yields. Certified organic producers will generally require their own on-farm cooler facility.

Price Risks - Local market prices remain fairly stable although potential competition from other direct marketers should continually be monitored when directly retailing or wholesaling certified organic potatoes. Wholesale prices from conventional packer/distributor agencies are fairly stable. Locally marketed certified organic potatoes with the current level of supplies are also fairly stable. The U.S. export prices for certified organic potatoes, however, can be more unstable with the producer making buyer contacts in a larger, more variable marketplace. Producers must be conservative in making price predictions for any large scale operation, as most of the production will be destined for the export market.

Market Risks - This will depend upon your marketing strategy. Direct marketing has different risks than indirect wholesale marketing. The local market is different than the export market. In all cases do your research. Ensure the varieties grown have a high demand and be aware of other growers/distributors that may impact the market.

The local fresh table potato market is a niche market. Further market development is required before any large scale production can be absorbed locally. Associated with the certified organic export market are increased costs due to shipping.

Sample Enterprise Budget And Worksheet

Transition To Certified Organic Potatoes Production - North Okanagan

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. Projected income and direct expenses are highly dependent on variety, marketing strategies, production factors, growing region, grower experience, and so forth.

Projected Income (per acre)

	Conventional	.....	Transition	.....	.....Certified Organic.....		
Marketable Yield	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Price (\$/lb)	11	4	5.5	7	8	8	8
Total Income	\$0.17	\$0.17	\$0.17	\$0.17	\$0.26	\$0.26	\$0.26
	\$3,740	\$1,360	\$1,870	\$2,380	\$4,160	\$4,160	\$4,160

Projected Direct Expenses (per acre)

Labour	Conventional	.....	Transition	.....	.....Certified Organic.....		
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
.hand weeding							
.harvesting		160	160	160	160	160	160
.wash/grade	\$144	\$144	\$144	\$144	\$144	\$144	\$144
.pack					\$384	\$384	\$384
.WCB&benefits(15.14%)					\$192	\$192	\$192
Total labour costs	\$22	\$46	\$46	\$46	\$133	\$133	\$133
Seeds	\$166	\$350	\$350	\$350	\$1,013	\$1,013	\$1,013
.conventional							
.certified	\$300						
.cover crop		\$500	\$500	\$500	\$500	\$500	\$500
Fertilizer		\$13	\$13	\$13	\$13	\$13	\$13
.8-20-20							
.compost	\$158						
Pesticides		\$175	\$175	\$175	\$175	\$175	\$175
.insecticides							
.fungicides	\$1						
.herbicides	\$177	\$114	\$114	\$114	\$114	\$114	\$114
pest, etc.monitorin	\$74						
Tractor fuel	\$40	\$40	\$40	\$40	\$40	\$40	\$40
Tractor oil&lube	\$59	\$81	\$82	\$84	\$84	\$84	\$84
Marketing	\$9	\$12	\$12	\$13	\$13	\$13	\$13
.packaging(50lb boxes)							
.hauling					\$560	\$560	\$560
.custom wash/grade	\$110	\$40	\$55	\$70			
.custom pack	\$605	\$220	\$303	\$385			
.warehouse/handlin	\$968	\$352	\$484	\$616			
.BC Veg.Commissi	\$154	\$56	\$77	\$98			
.industry devel./revi	\$31	\$11	\$15	\$20	\$22	\$22	\$22
.BC Ag.Coucil fees	\$14	\$5	\$7	\$9	\$10	\$10	\$10
.marketing fees (con	\$0.61	\$0.22	\$0.30	\$0.39	\$0.44	\$0.44	\$0.44
.marketing fees (cer	\$154	\$56	\$77	\$98			
Certification Fees					\$624	\$624	\$624
Repair & Maint.		\$80	\$80	\$80	\$80	\$80	\$80
Total	\$416	\$428	\$428	\$428	\$503	\$503	\$503
	\$3,436	\$2,533	\$2,812	\$3,091	\$3,751	\$3,751	\$3,751
Income-Direct Expenses							
	\$304	-\$1,173	-\$942	-\$711	\$409	\$409	\$409

Projected Indirect Expenses

Depreciation	
Interest	.....
Insurance	.....
Administration	.....
Legal/accounting	.....
Other	.....
Total	<u>.....</u>

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	<u>.....</u>
	Projected Net Income

Sensitivity Analysis

The profitability of both conventional and organic potato operations are influenced by market prices and yield. The table below illustrates the changes to income margin (income-direct expenses) as prices and yield vary.

Conventional

Price vs. Income - Direct Expenses

	50% Target Price	80% Target Price	Target Price	110% Target Price	120% Target Price
Price (\$/lb)					
Income less Direct Expenses	\$0.09	\$0.14	\$0.17	\$0.19	\$0.20
	-\$1,566	-\$444	\$304	\$678	\$1,052

Yield vs. Income - Direct Expenses

	75% Target Price	85% Target Price	Target Price	115% Target Price	125% Target Price
Yield (lb)					
Income less Direct Expenses	8.25	9.35	11.00	12.10	13.75
	-\$149	\$32	\$304	\$389	\$758

Organic

Price vs. Income - Direct Expenses

	45% Target Price	75% Target Price	Target Price	120% Target Price	140% Target Price
Price (\$/lb)					
Income less Direct Expenses	\$0.12	\$0.20	\$0.26	\$0.31	\$0.36
	-\$1,879	-\$631	\$409	\$1,241	\$2,073

Yield vs. Income - Direct Expenses

	50% Target Price	70% Target Price	Target Price	115% Target Price	125% Target Price
Yield (lb)					
Income less Direct Expenses	4.00	5.60	8.00	9.20	10.00
	-\$1,343	-\$642	\$409	\$934	\$1,284

Cash Flow Timing

The tables below indicate the monthly flow of income and direct expenses. A complete Projected Cash Flow should include indirect expenses, capital sales and purchases, loans and personal expenses.

Conventional

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

Certified Organic

% Income	J	F	M	A	M	J	J	A	S	O	N	D
% Expenses							10	30	30	20	10	
			35		5	5	10	15	15	15		

Hours Labour Required - Conventional vs. Organic Production

Task	Convent'l	Transition				Certified	
.Field Preparation:	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
spring							
fall	3	3	3	3	3	3	3
compost applicat	1	1	1	1	1	1	1
fertilizer applicat	0	1	1	1	1	1	1
.Planting	0.5						
.Cultivate/Hill	1	1	1	1	1	1	1
.Tineweed	1	4	4	4	4	4	4
.Spraying -herbicide		4	4	4	4	4	4
.Spraying -insect/ful	0.5						
.Topping	1.5	1.5	1.5	1.5	1.5	1.5	1.5
.Harvesting	0.5	0.5	0.5	0.5	0.5	0.5	0.5
.Wash/grade	30	30	30	30	30	30	30
.Pack	0	0	0	0	48	48	48
.Yarding					20	20	20
.Store/handling	2.2	0.8	1.1	1.4	1.6	1.6	1.6
.Total Labour					12	12	12
	41.2	46.8	47.1	47.4	115.6	115.6	115.6

Investment Capital Replacement Costs - Conventional vs. Organic Production

Item	Conventional	Transition	Net Change*	Cert.Organic	Net Change*
Buildings					
Tractor(s)	\$35,000	\$35,000	\$0	\$50,000	\$15,000
Implements	\$20,000	\$20,000	\$0	\$20,000	\$0
Harvester	\$31,500	\$35,500	\$4,000	\$35,500	\$4,000
Wash/grade/pack eq	\$5,000	\$5,000	\$0	\$5,000	\$0
Wagon/bins			\$0	\$10,000	\$10,000
Small tools and equ	\$7,000	\$7,000	\$0	\$7,000	\$0
Irrigation & Drainag	\$5,000	\$5,000	\$0	\$5,000	\$0
Vehicle (s)	\$10,000	\$10,000	\$0	\$10,000	\$0
Total	\$25,000	\$25,000	\$0	\$25,000	\$0
*change in investme	\$138,500	\$142,500	\$4,000	\$167,500	\$29,000

Conventional vs. Certified Organic Potato Production:

1. Size of Farms: Factors Affecting Production Costs and Returns

of the conventional farms are quite large (ie.100 acre average). This size differential will affect capital investment, with less total capital required, less expensive equipment, and less efficient equipment utilized on a smaller farm. Size will also affect returns. The larger organic farms must export into the U.S. market as the local niche market is not big enough to handle the volumes. The export market returns are often similar to conventional potato market returns. This budget assumed equal farm sizes of 10 acres for both conventional and organic production.

2. Labour: With less expensive and less efficient harvesting equipment, the total labour required for harvesting is higher than with more efficient harvesters used in larger operations. In addition, some hand weeding labour may be required for certified organic potato production, depending on your weed pressure.

3.Equipment: Certified organic producers in general wash, grade and pack all their own potatoes. There currently is no large scale organic packing house that can accept unwashed, field-run potatoes. Certified organic potato producers need to allow for the purchase of washing and grading equipment and be responsible for their own packaging supplies. Following this is the need for storage. Additional capital investment is required by certified organic producers for cold storage facilities. This budget assumed an additional building cost of 15000 for a cold storage facility and an extra \$10,000 for washing and grading equipment. To permit for the application of compost, certified organic potato growers also require a manure spreader (\$5000 investment cost assumed in this budget).

4. Pest control: Options for the control of diseases, such a late blight, in certified organic potato production are limited. If a disease outbreak occurs, a total crop loss can occur. Insect damage can also cause considerable losses. Without the arsenal of pesticides available to conventional growers, certified organic producers face a greater challenge to attain yield potentials. Certified organic producers can offset the production risk by keeping acreages small and producing a mixture of commodities. The direct expenses associated with pest control are notably lower in certified organic production than conventional production.

5. Certification fees: To maintain certified organic status, a farm must be registered with a certified organic or recognized association and have semi-annual inspections 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 inspections. In general the range for potato producers is \$250 to \$800 per farm.

6. Marketable Yield: Average values are generally lower for certified organic operations than conventional operations due to factors affecting production risks discussed at the beginning of this document. The amount of culls may be higher and yields may be lower than that estimated in this budget, particularly during transition when soil fertility and pest control problems tend to be the greatest (ie.until biological systems can adjust to the change).

7. Land Needs: The total land required to produce an acre of potatoes is higher for certified organic operations than for conventional operations due to the need for rotation crops and buffer zones. Rotation crops are needed for pest and soil fertility management. Buffer zones are required if there is a concern that contamination from adjacent land, roadways, and so forth, can occur.

References:

- COABC - 2001 - B. C. Certified Organic Production Operation Policies and Farm Management Standards (<http://www.certifiedorganic.bc.ca/Standards>)
- BCMAFF - Planning for Profit: Organic Russet Potatoes - Lower Fraser Valley - Spring 2000
<http://www.agf.gov.bc.ca/busmgmt/budgets/potato.htm>
- Potato Information Exchange, Dept - Crop&Soil Science, Oregon State University (<http://www.css.orst.edu/potatoes/>)
- Alberta Agriculture - 2000 - Potato Production Guide for Commercial Producers (<http://www.agric.gov.ab.ca/agdex/potato/>)
- 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
- B.C. Vegetable Marketing Commission - 201-7560 Vantage Way, Delta, B. C. V4G 1H1 - (604)940-0188 (<http://www.bcveg.com>)

Contributors:

The following people contributed to the preparation of this budget:

- Irene Bevandick, P - Ag - , contractor, Kelowna, B.C. (producer interviews, compile financial data, market factors,risks)
- Howard Joynt, P - Ag - , BCMAFF, Vernon, B.C. (review contractor information - drafts & final document)
- Wayne Odermatt, P - Ag - , BCMAFF, Abbotsford, B.C. (review contractor information - draft document)
- Rochelle Eisen, RARE Enterprises, Summerland, B.C. (editorial comments and final edit)
- Rick Gilmore, Lower Mainland Vegetable Distributors, Inc - , Delta, B.C. (conventional potato marketing costs)
- Lower Mainland custom potato packers (conventional potato wash/grade/pack costs)
- certified organic potato producers

Assumptions:

The following assumptions were made in calculating the sample budget:

1. Crop Information:

- Projected income and expenses are based on 1 acre of mixed variety potato planting* for all production systems.
 - Farm size is 10 acres. All potatoes are destined for the local fresh table potato market.
 - Following the harvest of potatoes in the transition and certified organic systems, a cover crop of oats is planted to capture residual nutrients and help build soil organic matter. In most certified organic production systems, potatoes are rotated with other crops, such as cereal crops, legumes, or other vegetable crops. The cover crop assumed in this budget in fact could be used as a rotation crop the subsequent year. Since the type of rotation plan is highly variable from farm to farm, production income and expenses from these rotation crops will not be accounted for in this sample budget. When completing individual farm budgets, the extra acreage required for crop rotation should be considered.
 - Certified organic seed is required for transition and certified organic potato production - The planting density for all production methods is 1 ton/acre. Certified seed cost is \$1000 /ton. Conventional seed cost is \$300 /ton.
 - The cover crop of oats is planted at a rate of 38kg/acre and a cost of \$0 - 33/kg.
- *yields, prices and input costs(eg.labour,wash&grade,packing) are highly dependent on variety and season. This budget attempts to reflect average values for a mixed early to late season variety planting.*

2. Fertilizer and Pesticides

a. Fertilizers

Fertilizer applications are assumed as follows:

conventional:

350kg of 8-20-20 to supply 28kg/acre N, 70kg/acre P₂O₅, and 70kg/acre K₂O;
amount assumes that soil nutrient residues are virtually nil and maximum replacement is

organic: needed; as a general rule, crop needs should be based on annual soil test results.
composted manure applied at 5 cubic meters/acre for a cost of \$35/cubic meter.

b. Pesticides

Pesticide applications are assumed as follows:

Conventional

herbicides	product applied	times used	unit	rate(/acre)	price/unit	expense
	Eptam 8 E	1	l	2	\$10.60	\$21.20
	plus Sencor DF	1	kg	0.18	\$84.39	\$15.19
	Sencor 75DF	1	kg	0.45	\$84.39	<u>\$37.98</u>
Insecticides	Total					\$74.37
	Thiodan*	0.09	kg	0.5	\$24.80	\$1.12
Fungicides	Total					\$1.12
	Bravo 500	2	l	0.75	\$15.50	\$23.25
	Fixed Copper	2	kg	2.2	\$8.65	\$38.06
	Dithane	2	kg	0.7	\$9.25	\$12.95
	plus Kocide DF	2	kg	0.7	\$14.27	\$19.98
	Dithane(seed tx.)	1	kg	9	\$9.25	<u>\$83.25</u>
Organic:	Total					\$177.49
fungicides						
	Fixed Copper	6	kg	2.2	\$8.65	\$114.18

**thiodan applied as border control for tuber flea beetle (0.09 of field treated)*

3. Yields

- Marketable target yields for conventional production are assumed at 11 tons/acre for a mixed variety planting .

- Marketable target yields for organic production are assumed at 4, 5 .5 and 7 tons/acre for the first, second and third year of transition, and 8 tons/acre for the subsequent years of fully certified organic production. Yields during transition can be higher or lower depending on grower skills, pest pressure, weather conditions, etc.

The transition yield estimated in this sample budget are rough estimates meant to illustrate the learning curve and adjustments in fertility and pest populations that occur during transition.

4. Marketing Information:

a. Costs

- Potatoes produced in the conventional system and during the transition to certified organic are custom packed and shipped to a licenced agency for marketing. Washing, grading, and packing are done by a custom packer. Handling (warehouse) and marketing fees are paid to the licensed agency. Fees for conventional and transition potatoes are assumed as follows:

Hauling fees:	\$10 per ton	
Custom wash/grade	\$55 per ton	
Custom pack	\$88 per ton	(includes cost of 50lb carton; assumes no storage)
Warehouse/handling fee	\$14 per ton	
Marketing fee:	\$14 per ton	
B.C.Veg.Commission fee:	\$2.81 per ton	
industry devel./review	\$1.25 per ton	
.Certified organic!. Ag. Council fee:	\$0.055 per ton	

packed on farm prior to shipping to the distributor. Marketing fees in the amount of 15% of price returns (ie.15% x \$0.26/lb)are payable to the organic produce distributor. These fees include shipping costs, handling costs, and all sales costs incurred by the distributor. Fees are also payable to the B.C. Vegetable Marketing Commission*. Packaging costs assume 50lb capacity boxes at \$1.75/box. Costs are outlined as follows:

Wash/grade labour:	6 hrs/ton	
Packing labour:	2.5 hrs/ton	
Handling labour:	1.5 hrs/ton	
Packaging costs:	\$70 per ton	(\$1.75/50lb box)
Marketing fees:	\$78 per ton	(15% x \$0.26/lb)
B.C.Veg.Commission fee*:	\$2.81 per ton	
industry devel./review*	\$1.25 per ton	
b. Returns Ag. Council fee*:	\$0.055 per ton	

Returns for conventional and transition potatoes:

Returns for certified organic potatoes (Vancouver wholesale):	0.17 per lb	340 per ton
	0.26 per lb	520 per ton

5. Labour Requirements:

There are no differences with respect to the following tasks between conventional, transition and certified organic.

Field Prep Spring

Field Prep Fall 3 hrs/acre

Planting 1 hrs/acre

Spraying -insect/fung* 1 hrs/acre

Topping 6 x 0.25 hrs/acre

Harvesting** 0.5 hrs/acre

*3 insecticide sprays applied with 6 30 hrs/acre; 5 people x 6hr.

transition and certified organic production

**Harvesting on larger operations is generally completed with the aid of more expensive and efficient equipment

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

Compost application

Fertilizer applications	1 hrs/acre	transition & certified organic	
Spraying -herbicide	1 x 0.5 hrs/acre	conventional only	
Cultivate/Hill	2 x 0.25 hrs/acre	conventional only	
	2 x 0.5 hrs/acre	conventional	
Tineweed	8 x 0.5 hrs/acre	transition & certified organic	
Hand weed	8 x 0.5 hrs/acre	transition & certified organic only	
Wash/grade	20 hrs/acre	transition & certified organic only	
Pack	6.0 hrs/ton	certified organic only	
Yarding	2.5 hrs/ton	certified organic only	
Storage/handling	0.2 hrs/ton	all production systems	(approx. 5 ton/hr)
	1.5 hrs/ton	certified organic only	

Hired Labour is paid at \$8/hr for the following tasks:

Hand weeding:			
Harvesting:	20 hrs/acre	transition & certified organic only	
Wash/Grade: 3 people x 6 hr/acre;	18 hrs/acre	all production systems	
Pack:	6.0 hrs/ton	certified organic only	
	2.5 hrs/ton	certified organic only	

6. Certification Fees

Certification fees include membership fees for certifying body, Certified Organic Assoc. of B.C. (COABC) fees, and farm inspection (audits) 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 \$80/acre for 10 acres of organic production.

7. Buildings/Equipment Costs:

a. Fuel Costs

Tractor fuel costs are calculated by the no of tractor hours x 8L/hr fuel consumption x \$050/L fuel price

The number of tractor hours assumed for all production systems are outlined below:

Task	Hours/acre						
	Conventional	Transition			Certified Organic		
	Yr.0	yr. 1	Yr.2	Yr.3	Yr.4	Yr.5	Yr.6
Field prep spring&fall:							
Fertilizer application:	4	4	4	4	4	4	4
Compost application:	0.5	0	0	0	0	0	0
plant:	0	1	1	1	1	1	1
cultivate/hill:	1	1	1	1	1	1	1
tineweed:	1	4	4	4	4	4	4
herbicide spray:	0	4	4	4	4	4	4
insect/fungicide spray:	0.5	0	0	0	0	0	0
top:	3	3	3	3	3	3	3
harvest:	0.5	0.5	0.5	0.5	0.5	0.5	0.5
yard:	2	2	2	2	2	2	2
Total	2.2	0.8	1.1	1.4	1.6	1.6	1.6
	14.7	20.3	20.6	20.9	21.1	21.1	21.1

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

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

b. Investment Capital

When switching from conventional to organic production, additional investment capital is required for a cooler, washing, grading, and packing, compost application, and seeding a cover crop. All capital investment costs assumed in this budget are outlined below:

Buildings			
implements/shop			
storage	\$20,000	all production systems	
wash/grade/store	\$15,000	conventional and transition	
Implements	\$30,000	certified	
tillers			
mower	\$10,500	all production systems	(plough,disc,rotovator,cultivator,hiller,tineweeder)
sprayer	\$2,000	all production systems	
planter & seeder	\$5,000	all production systems	
mower & attachments	\$6,000	all production systems	
fertilizer spreader	\$7,000	all production systems	
manure spreader	\$2,500	conventional	
Tractor(s)	\$5,000	transition and certified organic	
Potato Harvester	\$20,000	all production systems	
wash/grade equipment	\$5,000	all production systems	
Wagon/Bins	\$10,000	certified organic	
Irrigation & Drainage	\$7,000	all production systems	(\$2000 wagon; 200bins x \$25/bin)
Small Tools & Equip	\$10,000	all production systems	(\$1000/acre)
Vehicle (s)	\$5,000	all production systems	
	\$25,000	all production systems	