

# Guidelines For Estimating Irrigated Processing Potato Costs

## Production Costs based on 399 acres

**Date: March, 2007**

Potato acreage in Manitoba has increased significantly in the last 10 years. Expansion in the French Fry processing industry has been the main driver of this increase. This expansion has placed Manitoba second only to Prince Edward Island in total area planted to potatoes. Processing acreage in Manitoba accounts for over 80% of the total acreage and results in an annual value-added in excess of \$360,000,000. The balance of the acreage is divided between seed (10,500 acres) and fresh (table) production (8,000).

The following budget estimates the cost of producing processing potatoes based on a total land base of 480 acres, with certain input costs based on 420 acres and a harvested acreage of 399 acres. This is due to the trend toward the dryland corners not being planted to potatoes, where pivot irrigation is used. The figures provide an economic evaluation of processing potatoes required to cover all costs including labour and investment. Management has not been accounted for in this enterprise budget.

To estimate a cash flow budget the actual payments on principal and interest may be substituted for the fixed costs in the budget. As well, an estimate has to be made to cover family living expenses and funds required for capital purchases.

**Disclaimer:** This budget is only a guide and is not intended as an in-depth study of the cost of production of this industry. Interpretation and utilization of this information is the responsibility of the user. If you require assistance with developing your individual budget, please contact your local Manitoba Agriculture, Food and Rural Initiatives office.

## Irrigated Processing Potato - Input

### Assumptions

#### Yields

Gross Yield ( cwt/acre )	<b>285</b>
Dockage & shrink	<b>15%</b>
Marketable ( cwt/acre )	<b>242</b>

#### Total land base

Total Acres	<b>480</b>
Input acres	<b>420</b>
Harvested acres	<b>399</b>
Owned Land Value	<b>\$2,000</b>

#### Interest Rate

Operating	<b>7.0%</b>
Investment	<b>5.0%</b>

#### 1.01 Seed Cost & Treatment Cost

Seed Cost (\$/CWT)	<b>\$13.00</b>
Seeding Rate (CWT/ACRE)	<b>14</b>
Cutting Cost (\$/CWT)	<b>\$1.50</b>
Seed Treatment (\$/CWT)	
Fungicide	<b>\$1.50</b>
Insecticide	<b>\$2.05</b>

#### 1.02 Fertilizer Cost

	<b>Rate</b>	<b>Price</b>
	<b><u>Lbs/acre</u></b>	<b><u>\$/lb</u></b>
Nitrogen	<b>120</b>	<b>\$0.47</b>
Phosphate	<b>90</b>	<b>\$0.30</b>
Potassium	<b>175</b>	<b>\$0.230</b>
Sulfur	<b>25</b>	<b>\$0.200</b>
Other (Micro)	<b>0</b>	<b>\$4.50 ac</b>

#### 1.03 Herbicide Costs

	<b>Rate</b>	<b>Price</b>
	<b><u>Litres/acre</u></b>	<b><u>\$/Litre</u></b>
<b>Preplant</b>		
Roundup	<b>0.5</b>	<b>\$7.20</b>

<b>Post emergent</b>	<b><u>Amount</u></b>	<b><u>\$/Unit</u></b>
Sencor	0.15 kg	\$66.60 /kg
Prism	24 grams	\$0.82 /gram
Poast	1	\$11.80 /acre

<b>1.04 Fungicide Costs &amp; Insecticides</b>	<b><u>Times Applied</u></b>	<b><u>Rate kg/acre</u></b>	<b><u>Price \$/kg</u></b>
Contact Fungicide	11	1	\$9.00
Systemic Fungicide	2	1	\$22.50
Insecticide	2	1	\$11.00
Ridomil	0	0	\$0.00
Decis <sup>1</sup>	0	0	\$0.00

<sup>1</sup> included in other spraying operations

#### 1.05 Fuel Costs (field & trucking)

Fuel Cost \$/litre **\$0.78**

<b><u>Field Operation</u></b>	<b><u>Times Over</u></b>	<b><u>Width Feet</u></b>	<b><u>Speed MPH</u></b>	<b><u>Tractor HP</u></b>
Harrow	1	60	5	150
Rotera	1	19	1	180
Cultivate	0	37	5	180
Plant	1	19	3	150
Spray	3	73	5	150
Cultivate	1	19	5	150
Hilling	2	19	6	150
Fertilize	1	50	6	150
Harvest	1	12	2	180
Tandem Disk	1	27	5	180

#### Truck Fuel-Harvesting

Truck Capacity (cwts)	250
Fuel Consumption (miles/gal)	2.5
Distance to storage (miles)	15
Fuel Cost (\$/litre)	\$0.78

#### 1.06 Trucking Costs

Truck Capacity (cwts)	600
Trucking Rate (\$/cwt)	\$0.50
(based on 100 miles to processor)	
Trucking Reimbursement (\$/cwt)	\$0.35

**1.07 Irrigation Fuel Costs**

Inches applied	5
Hours/pivot (.75" water)	72
Hourly pumping costs	\$11.00
Number of pivots	3

**1.08 Maintenance & repairs**

Machinery	\$35,000
Trucks	\$17,500
Potato Storage	\$7,000
Other Buildings	\$5,000
Irrigation Equipment	\$10,000

**1.09 Custom Work & Rental**

Desiccation	\$0.00	\$0
Sprout Control (on half of crop)	\$0.00	\$0

**Spraying**

Number of Applications	14	
Custom Rate / Application	\$5.75	\$33,810
Fertilizer Customer Application	\$5.00	\$2,100
Other		

**1.10 Hired labour costs**

	<u>Number Required</u>	<u>Number Hours</u>	<u>Cost/ Hour</u>
Field Preparation	2	180	\$14.00
Seeding	2	300	\$14.00
Spray & Cultivate	1	300	\$14.00
Harvesting	14	2557	\$14.00
Irrigation	1	300	\$14.00
Storage	1	1200	\$14.00
<b>Total</b>		<b>4837</b>	

**1.11 Insurance Costs**

Crop Insurance (80%)	\$37.27	\$14,871
Trucks		\$2,500
Buildings & Equipment		\$3,492
Hail Insurance	\$12.80	\$5,107
Content Insurance		\$4,000

**1.12 Utilities**

Hydro	<b>\$10,000</b>
Heating Fuels	
Telephone	<b>\$2,500</b>

**1.13 Other Costs**

Accounting & Legal	<b>\$6,500</b>
Publications & Membership	<b>\$2,000</b>
Crop Consulting (\$28/ac)	<b>\$11,760</b>
Property Taxes	<b>\$4,000</b>
Shop Supplies	<b>\$2,000</b>
Miscellaneous	<b>\$2,000</b>

**Capital Costs****Depreciation** (straight line):**Useful Life:**

Buildings	<b>20</b> years
Storage Building	<b>20</b> years
Machinery & Equipment	<b>10</b> years
Irrigation Equipment	<b>15</b> years

**Salvage Value (% of original cost)**

Buildings	<b>5.0%</b>
Storage Building	<b>5.0%</b>
Machinery & Equipment	<b>10.0%</b>
Irrigation Equipment	<b>10.0%</b>

**Capital Investment****Land Value**

Own land 480 ac. @ \$2000/ac	<b>\$960,000</b>
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**Storage Facilities** (120,000 cwt)

Building, climate control & loading area (\$7.25/cwt)	<b>\$870,000</b>
Equipment (bobcat, pilers, etc.)	<b>\$120,000</b>
Machine Shed Workshop	<b><u>\$40,000</u></b>
<b>Total Storage Costs</b>	<b>\$1,030,000</b>

**Irrigation System**

River pump station	<b>\$74,000</b>
Booster pump station	<b>\$45,000</b>
Pipeline	<b>\$220,000</b>
Pivots & generators	<b><u>\$240,000</u></b>
<b>Total Irrigation Costs</b>	<b>\$579,000</b>

**Machinery & Equipment**

Tractors (assumed 2 )	<b>\$160,000</b>
Trucks (assumed 5)	<b>\$125,000</b>
Digger & Windrowers	<b>\$95,000</b>
Planter	<b>\$45,000</b>
Sprayers	<b>\$35,000</b>
Tillage Equipment	<b>\$50,000</b>
Miscellaneous	<b><u>\$10,000</u></b>
<b>Total Machinery &amp; Equipment Costs</b>	<b>\$520,000</b>

**Total Capital Investment** **\$3,089,000**

**Labour Costs** (Owner Labour hours based on study)

Hours per acre	<b>7</b>
Rate per hour	<b>\$14.00</b>

### Irrigated Processing Potato Cost of Production - March, 2007

	Potato Cost <u>/Acre</u>	Cost <u>/CWT</u>	Your Cost
<b>A. Operating Costs</b>			
1.01 Seed & cutting	\$203.00	\$0.84	_____
1.02 Seed treatment	\$52.32	\$0.22	_____
1.03 Fertilizer	\$140.16	\$0.58	_____
1.04 Herbicides	\$47.44	\$0.20	_____
1.05 Fungicide & Insecticide	\$174.74	\$0.72	_____
1.06 Fuel Costs-Field	\$77.37	\$0.32	_____
1.07 Trucking Costs	\$36.34	\$0.15	_____
1.08 Irrigation Fuel	\$39.70	\$0.16	_____
1.09 Maintenance & Repairs	\$186.72	\$0.77	_____
1.10 Custom Work & Rental	\$90.00	\$0.37	_____
1.11 Hired Labour	\$169.72	\$0.70	_____
1.12 Insurance	\$75.11	\$0.31	_____
1.13 Utilities	\$31.33	\$0.13	_____
1.14 Other Costs	<u>\$70.83</u>	<u>\$0.29</u>	_____
Subtotal Operating Costs	\$1,394.77	\$5.75	_____
1.15 Interest on Operating	<u>\$48.82</u>	<u>\$0.20</u>	_____
<b>Total Operating Costs</b>	<b>\$1,443.59</b>	<b>\$5.95</b>	_____
<b>B. Fixed Costs</b>			
2.01 Own Land Cost	\$100.00	\$0.41	_____
2.02 Depreciation	\$326.98	\$1.35	_____
2.03 Investment	<u>\$143.51</u>	<u>\$0.59</u>	_____
<b>Total Fixed Costs</b>	<b>\$570.49</b>	<b>\$2.35</b>	_____
<b>C. Labour</b>			
3.01 Own Labour	<b>\$98.00</b>	<b>\$0.40</b>	_____
<b>Total Cost of Production</b>	<b>\$2,112.08</b>	<b>\$8.70</b>	_____

**Disclaimer:** This budget is only a guide and is not intended as an in depth study of the cost of production of this industry. Interpretation and utilization of this information is the responsibility of the user.

### Assumptions

1. This budget outlines the cost of producing processing potatoes under irrigated conditions and is based on a pivot system with a river as the water source. (see back page for details)
2. A potato land base of 399 harvested acres was assumed in developing this budget. The cost of production does not include the cost of maintaining the corners not under irrigation. The crop rotation was based on growing potatoes no more than 1 in 3 years
3. Total gross yield per acre was assumed at 285 cwt/acre with marketable yield estimated at 242.25 cwt/acre. Assumed contract size of 100,000 cwt.
4. Crop Insurance is based on premiums for 2005 at the 80% coverage rate.
5. All trucking operations related to marketing of processed potatoes were assumed to be custom hauled to the processors. A rate applicable to hauling potatoes approximately 100 miles was assumed.

### Irrigated Potato Cost of Production Worksheet

**A. Operating Costs**

**Your Cost**

**1.01 Seed & Cutting Cost (Russet Burbank)**

Seed		14	cwt/acre	
	x	<u>\$13.00</u>	<u>\$/cwt</u>	
	=	\$182.00	\$/acre	
Cutting		14	cwt/acre	
	x	<u>\$1.50</u>	<u>\$/cwt</u>	
	=	\$21.00	\$/acre	
<b>Total</b>	<b>=</b>	<b>\$203.00</b>	<b>\$/acre harvested</b>	

**1.02 Treatment Cost**

		\$1.50	\$/cwt fungicide	
	+	\$2.05	\$/cwt insecticide	
	<u>x</u>	<u>14</u>	<u>cwt/acre</u>	
	=	<b>\$49.70</b>	<b>\$/acre seeded</b>	
	<b>x</b>	<b>420</b>	<b>acres seeded</b>	
	<u>÷</u>	<u>399</u>	<u>acres harvested</u>	
	=	<b>\$52.32</b>	<b>\$/acre harvested</b>	

**1.03 Fertilizer**

Nitrogen		120	lbs/acre	_____
	x	<u>\$0.47</u>	<u>\$ / lb</u>	_____
	=	\$56.40	\$/acre	_____
Phosphate		90	lbs/acre	_____
	x	<u>\$0.30</u>	<u>\$ / lb</u>	_____
	=	\$27.00	\$/acre	_____
Potash		175	lbs/acre	_____
	x	<u>\$0.230</u>	<u>\$ / lb</u>	_____
	=	\$40.25	\$/acre	_____
Sulfur		25	lbs/acre	_____
	x	<u>\$0.20</u>	<u>\$ / lb</u>	_____
	=	\$5.00	\$/acre	_____
Micro		\$4.50	\$/acre	_____
<b>Total</b>	<b>=</b>	<b>\$133.15</b>	<b>\$/acre</b>	_____
	<b>x</b>	<b>420</b>	<b>acres fertilized</b>	_____
	<b>÷</b>	<b>399</b>	<b>acres harvested</b>	_____
	<b>=</b>	<b>\$140.16</b>	<b>\$/acre harvested</b>	_____

**1.04 Herbicide**

Preplant		\$3.60	\$/acre	_____
Post emergent		<u>\$41.47</u>	<u>\$/acre</u>	_____
<b>Total</b>		<b>\$45.07</b>	<b>\$/acre</b>	_____
	<b>x</b>	<b>420</b>	<b>acres sprayed</b>	_____
	<b>÷</b>	<b>399</b>	<b>acres harvested</b>	_____
	<b>=</b>	<b>\$47.44</b>	<b>\$/acre harvested</b>	_____

**1.05 Fungicide & Insecticide**

Contact Fungicide		11	number applications	_____
	x	1	kg/acre	_____
	x	<u>\$9.00</u>	<u>\$/kg</u>	_____
	=	\$99.00	\$/acre	_____
Systemic Fungicide		2	number applications	_____
	x	1	kg/acre	_____
	x	<u>\$22.50</u>	<u>\$/kg</u>	_____
	=	\$45.00	\$/acre	_____

Insecticide		2	number applications	_____
	x	1	kg/acre	_____
	x	<u>\$11.00</u>	<u>\$/kg</u>	_____
	=	\$22.00	\$/acre	_____
<b>Total</b>	=	<b>\$166.00</b>	<b>\$/acre</b>	_____
	x	<b>420</b>	<b>acres sprayed</b>	_____
	÷	<u><b>399</b></u>	<u><b>acres harvested</b></u>	_____
	=	<b>\$174.74</b>	<b>\$/acre harvested</b>	_____

**1.06 Fuel Costs**

a) Field Fuel Costs

	<b>Capacity</b>	<b>TIME</b>	<b>FUEL</b>
	<u>ac./hr.</u>	<u>hr./ac.</u>	<u>\$/ac.</u>
Harrow	30.00	0.0333	\$0.92
Rotera	1.90	0.5263	\$17.46
Cultivate	18.50	0.0000	\$0.00
Plant	5.70	0.1754	\$4.85
Spray	36.50	0.0822	\$2.27
Cultivate	9.50	0.1053	\$2.91
Hilling	11.40	0.1754	\$4.85
Fertilize	30.00	0.0333	\$0.92
Harvest	2.40	0.4167	\$13.82
Tandem Disk	13.50	<u>0.0741</u>	<u>\$2.46</u>
Total		1.6221	\$50.46
		<b>acres worked</b>	<b>420</b>
		<u><b>acres harvested</b></u>	<u><b>399</b></u>
		<b>\$/acre harvested</b>	<b>\$53.12</b>

b) Truck Fuel Costs - from field to storage

		285	gross yield (cwt)/ac.	_____
	=	14.3	tons/ac.	_____
	÷	12.5	truck capacity (tons)	_____
	=	1.14	trips/acre	_____
	x	<u>15</u>	<u>distance/trip (miles)</u>	_____
	=	17.1	total miles/acre	_____
	÷	2.5	fuel consumption (miles/gal)	_____
	=	6.84	gallons required fuel	_____
	x	<u>\$0.78</u>	<u>fuel cost (\$/litre)</u>	_____
<b>Field to Storage Costs</b>	=	\$24.25	field to storage fuel cost	_____
<b>Field Costs</b>	=	<u>\$53.12</u>	<u>field costs</u>	_____
<b>Total Fuel Costs</b>	=	<b>\$77.37</b>	<b>\$/acre harvested</b>	_____

**1.07 Trucking Costs**

	242.25	net yield/acre	_____
x	<u>\$0.15</u>	<u>net trucking rate/cwt</u>	_____
=	<b>\$36.34</b>	<b>\$/acre harvested</b>	_____

**1.08 Irrigation Costs**

	72	hours for .75 inches	_____
=	96	hours for 1.0 inches	_____
x	5	inches water applied	_____
x	\$11.00	hourly pumping costs	_____
x	3	number of pivots	_____
÷	<u>399</u>	<u>acres</u>	_____
=	<b>\$39.70</b>	<b>\$/acre harvested</b>	_____

**1.09 Maintenance & Repairs**

	\$35,000	machinery	_____
+	\$17,500	trucks	_____
+	\$7,000	potato storage	_____
+	\$5,000	other buildings	_____
±	<u>\$10,000</u>	<u>irrigation</u>	_____
=	\$74,500	total	_____
÷	<u>399</u>	<u>acres</u>	_____
=	<b>\$186.72</b>	<b>\$/acre harvested</b>	_____

**1.10 Custom Work & Rental**

	\$0	desiccant	_____
+	\$0	sprout control	_____
+	\$33,810	spraying	_____
±	<u>\$2,100</u>	<u>fertilizer</u>	_____
=	\$35,910	total	_____
÷	<u>399</u>	<u>acres</u>	_____
=	<b>\$90.00</b>	<b>\$/acre harvested</b>	_____

**1.11 Hired Labour Costs**

	\$2,520	field preparation	_____
+	\$4,200	seeding	_____
+	\$4,200	spray & cultivate	_____
+	\$35,798	harvest	_____
+	\$4,200	irrigation	_____
+	<u>\$16,800</u>	<u>storage</u>	_____
=	\$67,718	total cost	_____
÷	<u>399</u>	<u>acres</u>	_____
=	<b>\$169.72</b>	<b>\$/acre harvested</b>	_____

**1.12 Insurance**

	\$5,107	hail insurance	
+	\$14,871	crop insurance	_____
+	\$4,000	content insurance	_____
+	\$2,500	trucks	_____
+	<u>\$3,492</u>	<u>bldgs &amp; equip</u>	_____
=	\$29,970	total insurance	_____
÷	<u>399</u>	<u>acres</u>	_____
=	<b>\$75.11</b>	<b>\$/acre harvested</b>	_____

**1.13 Utilities**

	\$10,000	hydro	_____
+	\$0	heating fuels	_____
+	<u>\$2,500</u>	<u>telephone</u>	_____
=	\$12,500	total utilities	_____
÷	<u>399</u>	<u>acres</u>	_____
=	<b>\$31.33</b>	<b>\$/acre harvested</b>	_____

**1.14 Other Costs**

	\$6,500	accounting & legal	_____
+	\$2,000	membership	_____
+	\$11,760	crop consulting	_____
+	\$4,000	property taxes	_____
+	\$2,000	shop supplies	_____
+	<u>\$2,000</u>	<u>other costs</u>	_____
=	\$28,260	total miscellaneous	_____
÷	<u>399</u>	<u>acres</u>	_____
=	<b>\$70.83</b>	<b>\$/acre harvested</b>	_____

**1.15 Interest on Operating Costs**

(Operating interest is charged on one-half the sub-total operating costs)

	\$1,394.77	operating costs	_____
÷	2	average	_____
=	\$697.38	average value	_____
x	<u>7.0%</u>	<u>operating interest</u>	_____
=	<b>\$48.82</b>	<b>\$/acre harvested</b>	_____

**Capital Investment**

**Land Value**

Own land 480 ac. @ \$2000/ac \$960,000 \_\_\_\_\_

**Storage Facilities (120,000 cwt)**

Building & Climate Control (\$6.00/cwt) \$870,000 \_\_\_\_\_

Equipment (bobcat,pilers,etc.) \$120,000 \_\_\_\_\_

Workshop \$40,000 \_\_\_\_\_

**Total Storage Costs** **\$1,030,000** \_\_\_\_\_

**Irrigation System**

River pump station \$74,000 \_\_\_\_\_

Booster pump station \$45,000 \_\_\_\_\_

Pipeline \$220,000 \_\_\_\_\_

Pivots & generators \$240,000 \_\_\_\_\_

**Total Irrigation Costs** **\$579,000** \_\_\_\_\_

**Machinery & Equipment**

Tractors (assumed 2 ) \$160,000 \_\_\_\_\_

Trucks \$125,000 \_\_\_\_\_

Digger & Windrowers \$95,000 \_\_\_\_\_

Planter \$45,000 \_\_\_\_\_

Sprayer \$35,000 \_\_\_\_\_

Tillage Equipment \$50,000 \_\_\_\_\_

Miscellaneous \$10,000 \_\_\_\_\_

**Total Machinery & Equipment Costs** **\$520,000** \_\_\_\_\_

**Total Capital Investment** **\$3,089,000** \_\_\_\_\_

**B. Fixed Costs**

**2.01 Land Costs**

		\$2,000	\$/acre		
x	5.0%		<u>investment rate</u>		
=	<b>\$100.00</b>		<b>\$/acre harvested</b>		

**2.02 Depreciation**

	<u>Original Value - Salvage Value</u>		
	<u>Useful life</u>		
Storage Facilities			
	\$1,030,000	original value	_____
-	\$51,500	salvage value	_____
÷	20	useful life (yrs.)	_____
÷	<u>399</u>	<u>total acres</u>	_____
=	\$122.62	\$/acre harvested	_____
Machinery & Equipment			
	\$520,000	original value	_____
-	\$52,000	salvage value	_____
÷	10	useful life (yrs.)	_____
÷	<u>399</u>	<u>total acres</u>	_____
=	\$117.29	\$/acre harvested	_____
Irrigation System			
	\$579,000	original value	_____
-	\$57,900	salvage value	_____
÷	15	useful life (yrs.)	_____
÷	<u>399</u>	<u>total acres</u>	_____
=	\$87.07	\$/acre harvested	_____
<b>Total =</b>	<b>\$326.98</b>	<b>\$/acre harvested</b>	_____

**2.03 Investment Cost**

**Original Value + Salvage Value X Investment Rate**

**2**

Storage Facilities

	\$1,030,000	original value	_____
+	\$51,500	salvage value	_____
÷	2	average value	_____
x	5.0%	Investment rate	_____
÷	<u>399</u>	<u>total acres</u>	_____
=	\$67.76	\$/acre harvested	_____

Machinery & Equipment

	\$520,000	original value	_____
+	\$52,000	salvage value	_____
÷	2	average value	_____
x	5.0%	Investment rate	_____
÷	<u>399</u>	<u>total acres</u>	_____
=	\$35.84	\$/acre harvested	_____

Irrigation System

	\$579,000	original value	_____
+	\$57,900	salvage value	_____
÷	2	average value	_____
x	5.0%	Investment rate	_____
÷	<u>399</u>	<u>total acres</u>	_____
=	\$39.91	\$/acre harvested	_____

**Total = \$143.51 \$/acre harvested** \_\_\_\_\_

**C. Own Labour Costs**

		7	hours/acre	_____
x		<u>\$14.00</u>	<u>\$/hour</u>	_____
=		<b>\$98.00</b>	<b>\$/acre harvested</b>	_____

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**For more information contact your local Manitoba Agriculture, Food and Rural Initiatives office**

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