

# Guidelines For Estimating Soybean Production Costs

**Date: January, 2006**

This guide is designed to provide you with planning information and a format for calculating costs of production for a soybean enterprise. Also available, is an Excel spreadsheet that can be downloaded from the Manitoba Agriculture, Food and Rural Initiatives website.

The cash cost inputs associated with growing a crop in Manitoba are substantial. It is extremely important for farm managers to do calculations to select the optimum crop combination that will maximize profits. Detailed planning is also necessary when estimating the amount of operating credit to finance the inputs.

Producers are encouraged to calculate their own costs of production. Costs and yields will differ on each farm due to soil type, climatic conditions and agronomic practices.

**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.

## Industry Summary

Soybeans are a long season crop, heat requiring crop. Under cool summer conditions as experienced in 2004 soybeans (and other heat loving crops) do not perform well. Over the past 8 years soybean acreage in Manitoba has increased from under 1,000 acres to over 220,000 acres with average yields of 35 plus bushels per acre (not including 2004). Soybeans can be grown for the local feed market, the crushing market or the edible food market.

**Crush/Local Feed Market:** Soybeans grown for crushing are currently shipped to large crushing plants in North Dakota or Minnesota. The local feed market is being supplied whole fat soybean meal by a small crushing plant located at Jordan Corner and roasted soybeans from a commercial roasting plant in the Emerson area. Roundup Ready and Conventional soybeans supply these markets. **Human Food Market:** Soybeans can also be grown under identity preserved (IP) contracts for premiums above the current market price in Chicago. These IP contracts, either yellow (called white by the processors) or dark hilum beans, are shipped to Europe and Asia. Hilums are the place where the bean is attached to the pod and can be yellow, black, brown or buff in colour. Some companies are contracting yellow or clear hilum soybean varieties for the human food market, **if the soybeans meet the buyers standards**. Yellow hilum soybeans that do not meet this standard are marketed through the crushing market. This is similar to farmers who grow barley for the malting industry.

## Soybeans - Input

### Assumptions:

1. This budget outlines the cost of production for soybeans.
2. Assumes use of fertilizer.
3. Production based on recommended practices.

<b>Operation Profile</b>	<b><u>Conventional</u></b>	<b><u>Roundup Ready</u></b>
Number of Acres	200	200
Yield per Acre (bushels)	35	35
Custom Spraying Cost per Acre	\$5.00	\$5.00
Market Price of Beans (\$/bu)	\$5.80	\$5.80
Price of Fuel (\$/litre)	\$0.80	\$0.80
<b>A. Operating Costs</b>		<b>Roundup Ready</b>
<b>1.01 Seed &amp; treatment</b>	<b><u>Conventional</u></b>	<b><u>Ready</u></b>
Plants /acre	200,000	200,000
Seeds/lb	3,000	3000
Emergence factor	1.15	1.15
Seeding Rate (lbs/acre)	77	77
Seed Cost (\$/lb)	\$0.45	\$0.72
Seed Treatment (\$/acre)	\$3.00	\$3.00
<b>1.02 Inoculant</b>		
Inoculate cost (\$/acre)	\$18.35	\$18.35
<b>1.03 Fertilizer</b>	<b><u>Cost Conventional</u></b>	<b><u>Roundup Ready</u></b>
Nitrogen	\$0.44      10	10
Phosphate	\$0.290      35	35
Potash	\$0.225      0	0
Sulfur	\$0.250      0	0
Zinc	\$1.50      0	0
<b>1.04 Herbicides</b>	<b><u>Conventional</u></b>	<b><u>Roundup Ready</u></b>
Roundup burnoff	\$0.00	\$0.00

Broadleaf	\$31.00	\$0.00
Grass	\$12.00	\$0.00
Roundup	\$0.00	\$17.00

**1.05 Fuel Costs**

Diesel Fuel Cost \$/litre **\$0.80**

**Conventional**

<u>Field Operation</u>	<u>Times Over</u>	<u>Width Feet</u>	<u>Speed MPH</u>	<u>Tractor HP</u>	
Spray	1	90	7	150	
Plant	1	24	5	150	
Spray	2	90	7	150	
Combine	1	24	4	150	
Cultivate	1	24	5	150	

**Roundup Ready**

<u>Field Operation</u>	<u>Times Over</u>	<u>Width Feet</u>	<u>Speed MPH</u>	<u>Tractor HP</u>	
Spray	1	90	7	150	
Plant	1	24	5	150	
Spray	1	90	7	150	
Combine	1	24	4	150	
Cultivate	1	24	5	150	

**Truck Fuel-Harvesting**

Truck Capacity (lbs)	<b>10,000</b>
Fuel Consumption (miles/gal)	<b>2</b>
Distance to storage (miles)	<b>5</b>
Fuel Cost (\$/litre)	<b>\$0.80</b>

**Other fuel expenses**

half ton, etc. (\$/acre)	<b>\$5.00</b>
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**1.05 Repairs & Maintenance**

Estimated %	<b>4%</b>
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**1.06 Insurance**

Crop Insurance	<b>\$5.38</b>
Hail	<b>\$5.07</b>

**1.07 Miscellaneous**

**\$8.00**

**1.08 Land Taxes** **\$5.25**

**1.09 Interest on Operating** **5.5%**

**Interest on Investment** **4.0%**

<b>Capital Costs</b>	<b><u>Cost/Acre</u></b>	<b><u>Useful Life</u></b>	<b><u>Salvage Value</u></b>
Land Market Value	<b>\$600</b>		
Machinery Investment	<b>\$245</b>	<b>10</b>	<b>0</b>
Storage Investment	<b>\$53</b>	<b>20</b>	<b>10</b>

**Labour Costs (\$/acre)**

Rate per hour	<b>\$11.50</b>	<b>\$11.50</b>
Hours per acre	<b>1.5</b>	<b>1.50</b>

## Soybean - Cost of Production Summary January, 2006

	<u>Conventional</u>		<u>Roundup Ready</u>		<u>Your Cost</u>
	<u>Cost</u> <u>/Acre</u>	<u>Cost</u> <u>/bushel</u>	<u>Cost</u> <u>/Acre</u>	<u>Cost</u> <u>/bushel</u>	
<b>A. Operating Costs</b>					
1.01 Seed & treatment	\$37.92	\$1.08	\$58.20	\$1.66	_____
1.02 Inoculant	\$18.35	\$0.52	\$18.35	\$0.52	_____
1.03 Fertilizer	\$14.55	\$0.42	\$14.55	\$0.42	_____
1.04 Herbicides	\$43.00	\$1.23	\$17.00	\$0.49	_____
1.05 Fuel Costs	\$15.94	\$0.46	\$15.49	\$0.44	_____
1.06 Repair & Maintenance	\$9.80	\$0.28	\$9.80	\$0.28	_____
1.07 Insurance	\$10.45	\$0.30	\$10.45	\$0.30	_____
1.08 Miscellaneous	\$8.00	\$0.23	\$8.00	\$0.23	_____
1.09 Land Taxes	<u>\$5.25</u>	<u>\$0.15</u>	<u>\$5.25</u>	<u>\$0.15</u>	_____
Subtotal Operating	\$163.26	\$4.66	\$157.09	\$4.49	_____
1.10 Interest on Operating	<u>\$4.49</u>	<u>\$0.13</u>	<u>\$4.32</u>	<u>\$0.12</u>	_____
<b>Total Operating Costs</b>	<b>\$167.75</b>	<b>\$4.79</b>	<b>\$161.41</b>	<b>\$4.61</b>	_____
<b>B. Fixed Costs</b>					
<b>2. Depreciation</b>					
2.01 Machinery	\$24.50	\$0.70	\$24.50	\$0.70	_____
2.02 Storage	\$2.36	\$0.07	\$2.36	\$0.07	_____
<b>3. Investment</b>					
3.01 Land	\$24.00	\$0.69	\$24.00	\$0.69	_____
3.02 Machinery	\$9.80	\$0.28	\$9.80	\$0.28	_____
3.03 Storage	<u>\$1.16</u>	<u>\$0.03</u>	<u>\$1.16</u>	<u>\$0.03</u>	_____
<b>Total Fixed Costs</b>	<b>\$61.82</b>	<b>\$1.77</b>	<b>\$61.82</b>	<b>\$1.77</b>	_____
<b>C. Labour</b>	<b>\$17.25</b>	<b>\$0.49</b>	<b>\$17.25</b>	<b>\$0.49</b>	_____
<b>Total Cost of Production</b>	<b>\$246.82</b>	<b>\$7.05</b>	<b>\$240.48</b>	<b>\$6.87</b>	_____
<b>Estimated yield per acre</b>	<b>35 bu</b>		<b>35 bu</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.

## Soybean Cost of Production Worksheet Conventional Assumptions

1. This budget provides a guideline to determine the cost of production for a soybean enterprise based on 200 acres.

2. The investment in machinery and equipment was assumed to be \$245 per acre, which is approximately \$20 more than a typical grain enterprise to represent the flex header purchase. Other than the flex header, the machinery complement is similar to a grain enterprise

3. A yield of 35 bushels per acre was assumed.

4. A premium inoculant program (7 lbs granular/acre plus 3/4 rate of peat) is included in the budget, with the assumption that the field seeded has not had 2 crops of well nodulated soybeans. Fields that have had 2 well nodulated crops within the last 6 years can reduce the inoculant cost. Consult your agronomist for more details.

5. A land value of \$600 per acre was assumed.

### A. Operating Costs

**Your Farm**

#### 1.01 Seed, treatment & inoculant

	200,000	plants/acre	
÷	3,000	seeds/lb	
x	1.15	emergence factor	
=	77	seeding rate lbs/acre	
x	\$0.45	seed cost (\$/lb)	
+	<u>\$3.00</u>	<u>seed treatment</u>	
=	<b>\$37.92</b>	<b>\$ /acre</b>	


#### 1.02 Inoculant \*

**\$18.35    \$ /acre**

\* When growing soybeans on the same field for the second or third time inoculant costs can be decreased to \$6 - \$12/acre if the previous soybean crop(s) had good nodulation.

#### 1.03 Fertilizer



Nitrogen		10	lbs/acre	
	x	<u>\$0.44</u>	<u>cost/lb</u>	
	=	\$4.40	\$ /acre	
P2O5		35	lbs/acre	
	x	<u>\$0.290</u>	<u>cost/lb</u>	
	=	\$10.15	\$ /acre	
K2O		0	lbs/acre	
	x	<u>\$0.225</u>	<u>cost/lb</u>	
	=	\$0.00	\$ /acre	
Sulfur		0	lbs/acre	
	x	<u>\$0.25</u>	<u>cost/lb</u>	
	=	\$0.00	\$ /acre	
Zinc		0	lbs/acre	
	x	<u>\$1.50</u>	<u>cost/lb</u>	
	=	\$0.00	\$ /acre	
<b>Total</b>	<b>=</b>	<b>\$14.55</b>	<b>\$ /acre</b>	

**1.04 Chemicals**

		\$0.00	roundup burnoff	
	+	\$31.00	post emergent broadleaf	
	+	\$12.00	post emergent grass	
	<u>±</u>	<u>\$0.00</u>	<u>Roundup</u>	
	<b>=</b>	<b>\$43.00</b>	<b>\$ /acre</b>	

**1.05 Fuel Costs**

**a) Field Fuel Costs**

<u>Operation</u>	<u>Times Over</u>	<u>Width feet</u>	<u>Speed mph</u>	<u>Fuel \$/ac.</u>
Cultivate	1	24	5	2.36
Spray	1	90	7	0.45
Plant	1	24	5	2.36
Spray	2	90	7	0.90
Combine	1	24	4	<u>2.95</u>
<b>Total</b>				<b>\$9.03</b>

**b) Truck Fuel Costs - from field to storage & market**

35	gross yield bu/acre	
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=	210	total tons	_____
÷	5	truck capacity (tons)	_____
=	42	trips	_____
x	5	miles dist/trip	_____
=	210	total miles	_____
÷	2	fuel consumption (miles/gal)	_____
=	477	total litres (4.546 litres/gal)	_____
÷	200	total acres	_____
=	2.385	litres/acre	_____
x	<u>\$0.80</u>	<u>fuel cost (\$/litre)</u>	_____
<b>Total =</b>	<b>\$1.91</b>	<b>trucking (\$ /acre)</b>	_____

**c) Other Fuel Costs                    \$5.00      \$ /acre**                    \_\_\_\_\_

**Total =                    \$15.94      fuel costs (\$ /acre)**                    \_\_\_\_\_

**1.06 Repair & Maintenance**

	4.0%	percentage rate	_____
x	<u>\$245</u>	<u>investment/acre</u>	_____
=	<b>\$9.80</b>	<b>\$ /acre</b>	_____

**1.07 Insurance**

	\$5.38	crop insurance	_____
+	<u>\$5.07</u>	<u>hail insurance</u>	_____
=	<b>\$10.45</b>	<b>\$ /acre</b>	_____

**1.08 Miscellaneous**

**=                    \$8.00      \$ /acre**                    \_\_\_\_\_

**1.09 Land Taxes**

**=                    \$5.25      \$ /acre**                    \_\_\_\_\_

**1.10 Interest on Operating**

	\$163.26	subtotal operating	_____
÷	2	average	_____
x	<u>5.5%</u>	<u>interest rate</u>	_____
=	<b>\$4.49</b>	<b>\$ /acre</b>	_____

**B. Fixed Costs**

**2. Depreciation**

**Original Value - Salvage Value**  
**Useful Life**

**2.01 Machinery**

	\$245.00	cost/acre	_____
-	\$0.00	salvage value	_____
÷	<u>10</u>	<u>useful life</u>	_____
=	<b>\$24.50</b>	<b>\$ /acre</b>	_____

**2.02 Storage**

	\$52.50	cost/acre	_____
-	\$5.25	salvage value	_____
÷	<u>20</u>	<u>useful life</u>	_____
=	<b>\$2.36</b>	<b>\$ /acre</b>	_____

**3. Investment**

$$\frac{\text{Original Value} + \text{Salvage Value}}{2} \times \text{Investment Rate}$$

**3.01 Land**

	\$600.00	cost/acre	_____
x	<u>4.0%</u>	<u>% investment rate</u>	_____
=	<b>\$24.00</b>	<b>\$ /acre</b>	_____

**3.02 Machinery**

	\$245.00	cost/acre	_____
+	\$0.00	salvage value	_____
x	<u>4.0%</u>	<u>% investment rate</u>	_____
=	<b>\$9.80</b>	<b>\$ /acre</b>	_____

**3.03 Storage**

	\$52.50	cost/acre	_____
+	\$5.25	salvage value	_____
÷	2	average	_____
x	<u>4.0%</u>	<u>% investment rate</u>	_____
=	<b>\$1.16</b>	<b>\$ /acre</b>	_____

**C. Labour**

	\$11.50	\$/hour	_____
x	<u>1.5</u>	<u>hours/acre</u>	_____
=	<b>\$17.25</b>	<b>\$ /acre</b>	_____

## Soybean Cost of Production Worksheet Roundup Ready Assumptions

1. This budget provides a guideline to determine the cost of production for a soybean enterprise based on 200 acres.
2. The investment in machinery and equipment was assumed to be \$245 per acre, which is approximately \$20 more than a typical grain enterprise to represent the flex header purchase. Other than the flex header, the machinery complement is similar to a grain enterprise
3. A yield of 35 bushels per acre was assumed.
4. The "technology use fee" is included in the cost of the Roundup Ready seed.
5. A premium inoculant program (7 lbs granular/acre plus 3/4 rate of peat) is included in the budget, with the assumption that the field seeded has not had 2 crops of well nodulated soybeans. Fields that have had 2 well nodulated crops within the last 6 years can reduce the inoculant cost. Consult your agronomist for more details.
6. A land value of \$550 per acre was assumed.

### A. Operating Costs

### Your Farm

#### 1.01 Seed, treatment & inoculant

	200,000	plants/acre	
÷	3,000	seeds/lb	
x	1.15	emergence factor	
=	77	seeding rate lbs/acre	
x	\$0.72	seed cost (\$/lb)	
+	<u>\$3.00</u>	<u>seed treatment</u>	
=	<b>\$58.20</b>	<b>\$ /acre</b>	

#### 1.02 Inoculant \*

**\$18.35    \$ /acre**

\* When growing soybeans on the same field for the second or third time inoculant costs can be decreased to \$6 - \$12/acre if the previous soybean crop(s) had good nodulation.

#### 1.03 Fertilizer

Nitrogen		10	lbs/acre	
	x	<u>\$0.44</u>	<u>cost/lb</u>	
	=	\$4.40	\$ /acre	
P2O5		35	lbs/acre	
	x	<u>\$0.290</u>	<u>cost/lb</u>	
	=	\$10.15	\$ /acre	
K2O		0	lbs/acre	
	x	<u>\$0.225</u>	<u>cost/lb</u>	
	=	\$0.00	\$ /acre	
Sulfur		0	lbs/acre	
	x	<u>\$0.25</u>	<u>cost/lb</u>	
	=	\$0.00	\$ /acre	
Zinc		0	lbs/acre	
	x	<u>\$1.50</u>	<u>cost/lb</u>	
	=	\$0.00	\$ /acre	
<b>Total</b>	<b>=</b>	<b>\$14.55</b>	<b>\$ /acre</b>	

**1.04 Herbicides**

		\$0.00	burnoff	
	+	\$0.00	volunteer control	
	+	\$0.00	grass control	
	±	<u>\$17.00</u>	<u>in crop Roundup</u>	
	=	<b>\$17.00</b>	<b>\$ /acre</b>	

**1.05 Fuel Costs**

**a) Field Fuel Costs**

<u>Operation</u>	<u>Times Over</u>	<u>Width feet</u>	<u>Speed mph</u>	<u>Fuel \$/ac.</u>
Cultivate	1	90	7	0.45
Spray	1	24	5	2.36
Plant	1	90	7	0.45
Spray	1	24	4	2.95
Combine	1	24	5	<u>2.36</u>
<b>Total</b>				<b>\$8.58</b>

**b) Truck Fuel Costs - from field to storage & market**

35	gross yield bu/acre	
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=	210	total tons	_____
÷	5	truck capacity (tons)	_____
=	42	trips	_____
x	5	miles dist/trip	_____
=	210	total miles	_____
÷	2	fuel consumption (miles/gal)	_____
=	477	total litres (4.546 litres/gal)	_____
÷	200	total acres	_____
=	2.385	litres/acre	_____
x	<u>\$0.80</u>	<u>fuel cost (\$/litre)</u>	_____
<b>Total =</b>	<b>\$1.91</b>	<b>trucking (\$ /acre)</b>	_____

<b>c) Other Fuel Costs</b>	<b><u>\$5.00</u></b>	<b>\$ /acre</b>	_____
<b>Total =</b>	<b>\$15.49</b>	<b>fuel costs (\$ /acre)</b>	_____

**1.06 Repair & Maintenance**

x	4.0%	percentage rate	_____
	<u>\$245</u>	<u>investment/acre</u>	_____
=	<b>\$9.80</b>	<b>\$ /acre</b>	_____

**1.07 Insurance**

	\$5.38	crop insurance	_____
+	<u>\$5.07</u>	<u>hail insurance</u>	_____
=	<b>\$10.45</b>	<b>\$ /acre</b>	_____

**1.08 Miscellaneous**

=	<b>\$8.00</b>	<b>\$ /acre</b>	_____
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**1.09 Land Taxes**

=	<b>\$5.25</b>	<b>\$ /acre</b>	_____
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**1.10 Interest on Operating**

	\$157.09	subtotal operating	_____
÷	2	average	_____
x	<u>5.5%</u>	<u>interest rate</u>	_____
=	<b>\$4.32</b>	<b>\$ /acre</b>	_____

**B. Fixed Costs**

**2. Depreciation**

$$\frac{\text{Original Value} - \text{Salvage Value}}{\text{Useful Life}}$$

**2.01 Machinery**

	\$245.00	cost/acre	_____
-	\$0.00	salvage value	_____
÷	<u>10</u>	<u>useful life</u>	_____
=	<b>\$24.50</b>	<b>\$ /acre</b>	_____

**2.02 Storage**

	\$52.50	cost/acre	_____
-	\$5.25	salvage value	_____
÷	<u>20</u>	<u>useful life</u>	_____
=	<b>\$2.36</b>	<b>\$ /acre</b>	_____

**3. Investment**

$$\frac{\text{Original Value} + \text{Salvage Value}}{2} \times \text{Investment Rate}$$

**3.01 Land**

	\$600.00	cost/acre	_____
x	<u>4.0%</u>	<u>% investment rate</u>	_____
=	<b>\$24.00</b>	<b>\$ /acre</b>	_____

**3.02 Machinery**

	\$245.00	cost/acre	_____
+	\$0.00	salvage value	_____
x	<u>4.0%</u>	<u>% investment rate</u>	_____
=	<b>\$9.80</b>	<b>\$ /acre</b>	_____

**3.03 Storage**

	\$52.50	cost/acre	_____
+	\$5.25	salvage value	_____
÷	2	average	_____
x	<u>4.0%</u>	<u>% investment rate</u>	_____
=	<b>\$1.16</b>	<b>\$ /acre</b>	_____

**C. Labour**

	\$11.50	\$/hour	_____
x	<u>1.50</u>	<u>hours/acre</u>	_____
=	<b>\$17.25</b>	<b>\$ /acre</b>	_____

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For further information contact your local Manitoba Agriculture, Food and Rural Initiatives office.

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