

Case Study #4: Enterprise Change - The North Farm

Alternate Scenarios

This fictional Case Study featuring Will and Jane North was prepared as part of a series to illustrate the process involved, and benefits of completing a financial review to analyze options that might be available for a farm operation. Every Situation has several possible solutions. The original Case Study Mixed Farm Operation illustrates an action plan based on one scenario. The following are action plans for alternative scenarios for this farm family to consider:

[Scenario 2](#) – sell excess equipment, purchase equipment and cattle

[Scenario 3](#) – if calf prices decreased

[Scenario 4](#) – if expenses increased

[Scenario 5](#) – if crop prices increased

Note: This Case Study and the alternate scenarios are not a recommendation for a particular course of action. Individual results for farm operators considering all their own option will vary, with their own financial information and family and business goals.

Scenario 2: The Action Plan –

In this scenario, the projections consider how the financial results would change if the net capital cost for the transition from cash crops to beef was to increase:

- a decreased net return in the equipment being sold of 10%
- an increase cost of equipment and cattle being purchased of 10%

All other costs, and returns, and assumed levels of production and prices are kept the same as in the original scenario.

Operations were projected for 2 years based on these changes. The results follow:

<u>After Change Projection (Year 1)</u>					
<u>Income (Jan 1 - Dec 31, 2016)</u>				<u>Expenses (Jan 1 - Dec 31, 2016)</u>	
Income				Expense	
Livestock sales				Livestock purch. & expense	457,500
calves	0	x	0	Cropping expense	226,245
cull cows	0	x	0	Overhead expense	10,500
repl. hfrs	0	x	0	Operating interest	1,398
bulls	0		0	Term interest	23,433
Total			0	Total Cash Expense	719,076
Crop sales				Non Cash Expense	
canola	14000	x	10.00	Depreciation	40,800
barley	25000	x	4.10	Exp. side acc. adj.	(48,109)
oats	22000	x	2.50	Total Non Cash Expense	(7,309)
Total			297,500		
Other income				Total Accrued Expense	711,767
Gov't programs			5,000	Net Accrued Farm Income	2,573
Custom work			8,000	Net wages	30,000
Other			6,800	Living costs	48,000
Total			19,800	Income tax	0
Total Cash Income			317,300	Debt Service Capacity	48,806
Inc. side accrual adjustments			397,040	(Net acc. farm inc. + depreciation	
				+ term interest + non farm income	
Total Accrued Income			714,340	- living costs - income tax)	

Profitability Ratios:

Debt Service Ratio:	0.53
Return on Assets:	-0.26%
Return on Equity:	-2.93%
Max. operating loan required:	100,965

Payments

Principal	68,953
Interest	23,433
Total	92,386

Closing Financial Ratios:

Current Ratio	0.60
Debt to Equity Ratio	0.76
Equity Ratio	0.57

After Change Projection (Year 2)

Income (Jan 1 - Dec 31, 2017)

Income

Livestock sales			
calves	144	x 1,500	216,000
cull cows	26	x 1,400	36,400
repl. hfrs	12	x 2,000	24,000
bulls	4	2,500	10,000
Total			<u>286,400</u>

Crop sales

canola	5200	x 10.00	52,000
barley	17400	x 4.10	71,340
Total			<u>123,340</u>

Other income

Gov't programs			5,000
Custom work			8,000
Other			6,800
Total			<u>19,800</u>

Total Cash Income 429,540

Inc. side accrual adjustments (96,940)

Total Accrued Income 332,600

Expense (Jan 1 - Dec 31, 2017)

Expense

Livestock expense	78,280
Cropping expense	65,950
Overhead expense	10,500
Operating interest	5,496
Term interest	36,970

Total Cash Expense 197,196

Non Cash Expense

Depreciation	43,396
Exp. side acc. adj.	(1,529)

Total Non Cash Expense 41,867

Total Accrued Expense 239,063

Net Accrued Farm Income 93,537

Net wages 30,000

Living costs 48,000

Income tax 20,000

Debt Service Capacity 135,904

(Net acc. farm inc. + depreciation
+ term interest + non farm income
- living costs - income tax)

Profitability Ratios:

Debt Service Ratio:	1.25
Return on Assets:	3.46%
Return on Equity:	2.81%
Max. operating loan required:	88,040

Payments

Principal	71,708
Interest	36,970
Total	<u>108,679</u>

Closing Financial Ratios:

Current Ratio	0.73
Debt to Equity Ratio	0.53
Equity Ratio	0.65

Some comments about these results are as follows:

1. In this scenario, the operation is unchanged from a production standpoint, so projected cash revenue is the same as in the original case. Net accrued income is similar as well, even though cash expenses are higher due to the increased cost of livestock.
2. Because the assets being sold are being projected to bring less, and those being purchased are projected to cost more in this scenario, the new long term loan projected in this case is \$50,000 higher than in the original scenario. As that will not fully cover the additional capital requirement, this scenario sees cash on hand at the end of Year 2 being about \$30,000 less than in the original scenario as well, but it is projected the operating loan requirement will still remain within the limits approved.
3. With the higher loan requirement of this scenario, debt service capacity is slightly reduced, and payment requirement slightly increased. As a result, the Debt Service Ratio in this scenario is weaker than in the original case, but is still considered to be marginally acceptable.

[| Scenario 2](#) | [Scenario 3](#) | [Scenario 4](#) | [Scenario 5](#) |

Scenario 3: The Action Plan –

In this scenario, the projections show how the financial results would change if the price for calves sold was to decrease:

- The change of operation to beef cow/calf taking place as per the original scenario
- First calf price level – the projected sale price for fall calves dropping by 10% from \$1,500 per head to \$1,350 per head
- Second calf price level – the projected sale price for fall calves dropping by 10% from \$1,500 per head to \$1,200 per head

All other revenues, and expense are projected to remain the same as in the original scenario. Projected tax payment will be impacted in each case however, because of the resulting drop in net income. The change is made to Year 2 only, as no calves are produced in Year 1. Instead of 2 years projections at each price level, then, only Year 2 is being reviewed.

Operations were projected for 1 year for each price level. The results follow:

<u>After Change Projection (Year 2)</u>			
(assuming 10% drop in calf prices)			
<u>Income (Jan 1 - Dec 31, 2017)</u>		<u>Expense (Jan 1 - Dec 31, 2017)</u>	
Income		Expense	
Livestock sales		Livestock expense	74,280
calves	144 x 1,350	Cropping expense	65,950
	194,400	Overhead expense	10,500
cull cows	26 x 1,400	Operating interest	5,297
	36,400	Term interest	34,828
repl. hfrs	12 x 2,000	Total Cash Expense	190,856
	24,000	Non Cash Expense	
bulls	4 x 2,500	Depreciation	42,896
	10,000	Exp. side acc. adj.	(1,508)
Total	264,800	Total Non Cash Expense	41,388
Crop sales		Total Accrued Expense	232,244
canola	5200 x 10.00	Net Accrued Farm Income	76,356
	52,000	Net wages	30,000
barley	17400 x 4.10	Living costs	48,000
	71,340	Income tax	15,000
Total	123,340	Debt Service Capacity	121,081
Other income		(Net acc. farm inc. + depreciation + term interest + non farm income - living costs - income tax)	
Gov't programs	5,000		
Custom work	8,000		
Other	6,800		
Total	19,800		
Total Cash Income	407,940		
Inc. side accrual adjustments	(99,340)		
Total Accrued Income	308,600		

Profitability Ratios:

Debt Service Ratio:	1.16
Return on Assets:	2.74%
Return on Equity:	1.76%
Max. operating loan required:	80,451

Payments

Principal	69,355
Interest	34,828
Total	104,183

Closing Financial Ratios:

Current Ratio	0.94
Debt to Equity Ratio	0.50
Equity Ratio	0.67

After Change Projection (Year 2)

(assuming 20% drop in calf prices)

Income (Jan 1 - Dec 31, 2017)

Income

Livestock sales

calves	144	x	1,200	172,800
cull cows	26	x	1,400	36,400
repl. hfrs	12	x	2,000	24,000
bulls	4		2,500	10,000
Total				<u>243,200</u>

Crop sales

canola	5200	x	10.00	52,000
barley	17400	x	4.10	71,340
Total				<u>123,340</u>

Other income

Gov't programs				5,000
Custom work				8,000
Other				6,800
Total				<u>19,800</u>

Total Cash Income

386,340

Inc. side accrual adjustments (99,340)

Total Accrued Income

287,000

Expense (Jan 1 - Dec 31, 2017)

Expense

Livestock expense	74,280
Cropping expense	65,950
Overhead expense	10,500
Operating interest	5,239
Term interest	34,828

Total Cash Expense

190,797

Non Cash Expense

Depreciation	42,896
Exp. side acc. adj.	(1,508)

Total Non Cash Expense

41,388

Total Accrued Expense

232,185

Net Accrued Farm Income

54,815

Net wages	30,000
Living costs	48,000
Income tax	11,000

Debt Service Capacity

103,539

(Net acc. farm inc. + depreciation
+ term interest + non farm income
- living costs - income tax)

Profitability Ratios:

Debt Service Ratio:	0.99
Return on Assets:	1.85%
Return on Equity:	0.42%
Max. operating loan required:	80,451

Payments

Principal	69,355
Interest	34,828
Total	<u>104,183</u>

Closing Financial Ratios:

Current Ratio	0.73
Debt to Equity Ratio	0.51
Equity Ratio	0.66

Some comments about these results are as follows:

1. In this scenario, the only thing that changes is the price of the calves being sold. All other revenues and expenses remain the same as in the original case.
2. In the original scenario, the Debt Service Ratio was projected to be 1.32, which is normally considered to be adequate. At the 10% price drop (\$1,500 per calf sold to \$1,350 per calf sold), that ratio drops to 1.16, which is very marginal, and at the 20% price drop (\$1,500 per calf sold to \$1,200 per calf sold), it further decreases to .99, which is normally considered to be not acceptable.
3. In each of the options, the Norths would have the cash flow to make their payments as due in the years projected, but with the decreased revenue, profitability and debt service capacity, over time cash reserves would be depleted, and operating loan increased if obligations are to be paid as due. Should low prices persist into the longer term, they may have to make further changes to their operation to survive.

This scenario illustrates the need to test the sensitivity of the projections to changes in possible revenues and expenses. If it is believed that a product price that would result in inadequate income and debt serviceability is reasonably probable, other options may need to be considered.

| [Scenario 2](#) | [Scenario 3](#) | [Scenario 4](#) | [Scenario 5](#) |

Scenario 4: The Action Plan –

In this scenario, how the financial results would change if key operating expenses were to increase:

- The change of operation to beef cow/calf taking place as per the original scenario
- First input cost level – livestock and crop variable costs, including land rent, increasing by 10%
- Second input cost level - livestock and crop variable costs, including land rent, increasing by 20%

All other revenues, and expense are projected to remain the same as in the original scenario. Projected tax payment will be impacted in each case however, because of the resulting drop in net income. The change is made to Year 2 of the projections only.

Operations were projected for 1 year for each cost level. The results follow:

<u>After Change Projection (Year 2)</u>			
(assuming 10% increase in variable expenses)			
<u>Income (Jan 1 - Dec 31, 2017)</u>		<u>Expense (Jan 1 - Dec 31, 2017)</u>	
Income		Expense	
Livestock sales		Livestock expense	77,708
calves	144 x 1,500	Cropping expense	72,545
	216,000	Overhead expense	10,500
cull cows	26 x 1,400	Operating interest	5,394
	36,400	Term interest	34,828
repl. hfrs	12 x 2,000		
	24,000	Total Cash Expense	200,976
bulls	4 x 2,500		
	10,000	Non Cash Expense	
Total	286,400	Depreciation	42,896
		Exp. side acc. adj.	-1,508
Crop sales		Total Non Cash Expense	41,388
canola	5200 x 10.00		
	52,000	Total Accrued Expense	242,364
barley	17400 x 4.10	Net Accrued Farm Income	87,836
	71,340	Net wages	30,000
Total	123,340	Living costs	48,000
		Income tax	17,000
Other income		Debt Service Capacity	130,560
Gov't programs	5,000	(Net acc. farm inc. + depreciation	
Custom work	8,000	+ term interest + non farm income	
Other	6,800	- living costs - income tax)	
Total	19,800		
Total Cash Income	429,540		
Inc. side accrual adjustments	-99,340		
Total Accrued Income	330,200		

Profitability Ratios:

Debt Service Ratio:	1.25
Return on Assets:	3.21%
Return on Equity:	2.46%
Max. operating loan required:	82,663

Payments

Principal	69,355
Interest	34,828
Total	104,183

Closing Financial Ratios:

Current Ratio	1.06
Debt to Equity Ratio	0.50
Equity Ratio	0.67

After Change Projection (Year 2)
(assuming 20% increase in variable expenses)

Income (Jan 1 - Dec 31, 2017)

Income

Livestock sales			
calves	144	x 1,500	216,000
cull cows	26	x 1,400	36,400
repl. hfrs	12	x 2,000	24,000
bulls	4	x 2,500	10,000
Total			<u>286,400</u>
Crop sales			
canola	5200	x 10.00	52,000
barley	17400	x 4.10	71,340
Total			<u>123,340</u>

Other income

Gov't programs	5,000
Custom work	8,000
Other	6,800
Total	<u>19,800</u>

Total Cash Income 429,540

Inc. side accrual adjustments -99,340

Total Accrued Income 330,200

Expense (Jan 1 - Dec 31, 2017)

Expense

Livestock expense	81,136
Cropping expense	79,140
Overhead expense	10,500
Operating interest	5,433
Term interest	34,828

Total Cash Expense 211,037

Non Cash Expense

Depreciation	42,896
Exp. side acc. adj.	<u>-1,508</u>

Total Non Cash Expense 41,388

Total Accrued Expense 252,425

Net Accrued Farm Income 77,775

Net wages	30,000
Living costs	48,000
Income tax	15,000

Debt Service Capacity 122,499

(Net acc. farm inc. + depreciation
+ term interest + non farm income
- living costs - income tax)

Profitability Ratios:

Debt Service Ratio:	1.18
Return on Assets:	2.80%
Return on Equity:	1.84%
Max. operating loan required:	84,870

Payments

Principal	69,355
Interest	34,828
Total	<u>104,183</u>

Closing Financial Ratios:

Current Ratio	0.96
Debt to Equity Ratio	0.50
Equity Ratio	0.67

Some comments about these results are as follows:

4. the increase in input costs is only done for Year 2 of the projections. It is assumed that the costs for Year 1 are known, but that they will rise to these levels in the following and subsequent years
5. as would be expected, the increase in input costs weakens all of the financial results from the original scenario.
6. in both levels of increased input costs, the results continue to be slightly better than what they are presently experiencing as illustrated in the “before change” projections
7. in both projections, with the increase in input costs, operating loan requirements, at least in the first few years, would increase. As long as calf prices remain strong, however, and Jane continues with her non farm employment, in both cases, cash flow should allow for a slow decrease in operating loan requirements over time
8. In the original scenario, the Debt Service Ratio was projected to be 1.32, which is normally considered to be adequate. At the 10% cost increase that ratio drops to 1.25, which is generally considered to be acceptable, and at the 20% cost increase it further decreases to 1.18, which is marginally acceptable. If there are further challenges to revenue, or expense, or if debt service requirements increase, the Norths could find themselves in a situation where, over time, their income is insufficient to service debt as required.

As with Scenario 3, this scenario illustrates the need to test the sensitivity of the projections to changes in possible revenues and expenses. If it is believed that operating costs that would result in inadequate income and debt serviceability is reasonably probable, other options may need to be considered.

[| Scenario 2](#) | [Scenario 3](#) | [Scenario 4](#) | [Scenario 5](#) |

Scenario 5: The Action Plan –

In this alternative, the projections look at how the financial results would change if the operation continued on producing grain as at present, and if crop prices were to increase:

- There would be no change of operation as assumed in the “after change” scenario, rather, operations would continue on as at present
- First crop price level – crop prices increase by 5%
- Second crop price level – crop prices increase by 10%

All other revenues, and expense are projected to remain the same as originally projected. Expected tax payment will be impacted in each case however, because of the resulting increase in net income. The change is made to Year 1 of the projections only which reflects the operation as it presently exists, without changes.

Operations were projected for 1 year for each price level. The results follow:

<u>North Farm Income/Expense Summary</u>			
(original operation, assume 5% increase in crop prices)			
<u>Income (Jan 1 - Dec 31, 2016)</u>		<u>Expenses (Jan 1 - Dec 31, 2016)</u>	
Income		Expense	
Crop sales		Cropping expense	224,345
canola	14000 x 10.50	Overhead expense	10,500
barley	25000 x 4.30	Operating interest	1,121
oats	35000 x 2.63	Term interest	23,433
Total	346,550	Total Cash Expense	259,399
Other income		Non Cash Expense	
gov't programs	5,000	Depreciation	40,800
custom work	8,000	Exp. side acc. adj.	-200
leases	4,800	Total Non Cash Expense	40,600
other	2,000	Total Accrued Expense	299,999
Total	19,800	Net Accrued Farm Income	60,026
Total Cash Income	366,350	Net wages	30,000
		Living costs	48,000
		Income tax	12,000
Inc. side accrual adjustments	-6,325	Debt Service Capacity	94,259
Total Accrued Income	360,025	(Net acc. farm inc. + depreciation + term interest + non farm income - living costs - income tax)	

Profitability Ratios:

Debt Service Ratio:	1.27
Return on Assets:	1.56%
Return on Equity:	0.73%
Max. operating loan required:	77,040

Payments

Principal	50,753
Interest	23,433
Total	74,186

Closing Financial Ratios:

Current Ratio	1.35
Debt to Equity Ratio	0.38
Equity Ratio	0.73

North Farm Income/Expense Summary

(original operation, assume 10% increase in crop prices)

Income (Jan 1 - Dec 31, 2016)

Income

Crop sales			
canola	14000	x 11.00	154,000
barley	25000	x 4.50	112,500
oats	35000	x 2.75	96,250
Total			362,750

Other income

gov't programs			5,000
custom work			8,000
leases			4,800
other			2,000
Total			19,800

Total Cash Income 382,550

Inc. side accrual adjustments -6,625

Total Accrued Income 375,925

Expenses (Jan 1 - Dec 31, 2016)

Expense

Cropping expense	224,345
Overhead expense	10,500
Operating interest	956
Term interest	23,433

Total Cash Expense 259,234

Non Cash Expense

Depreciation	40,800
Exp. side acc. adj.	-200

Total Non Cash Expense 40,600

Total Accrued Expense 299,834

Net Accrued Farm Income 76,091

Net wages 30,000

Living costs 48,000

Income tax 15,000

Debt Service Capacity 107,324

(Net acc. farm inc. + depreciation
+ term interest + non farm income
- living costs - income tax)

Profitability Ratios:

Debt Service Ratio:	1.45
Return on Assets:	2.27%
Return on Equity:	1.70%
Max. operating loan required:	70,300

Payments

Principal	50,753
Interest	23,433
Total	74,186

Closing Financial Ratios:

Current Ratio	1.57
Debt to Equity Ratio	0.37
Equity Ratio	0.73

Some comments about these results are as follows:

9. In the original grain operation, with the crop prices used, the Debt Service Ratio was projected to be 1.17, which was felt to be marginal. At the 5% crop price increase that ratio rises to 1.27, which is generally considered to be acceptable, and at the 10% crop price increase it further rises to 1.45, which is considered to be strong.
10. As with the Debt Service Ratio, all financial indicators improve under these 2 changes.

This scenario illustrates the need to analyze assumptions about an existing operation before making major changes, as with small increase in crop prices, the operation as it presently exists shows reasonable financial strength

Summary

Four alternative Scenarios have been developed for this Case Study. Each Scenario has it's own individual results, positive features and negative features. Please refer to the Summary document which displays the Financial Ratios and Indicators for each Scenario, and what are considered to be the Positives and Negatives of each relative to the Case Study presented and Business and Personal Goals of the Case Study Farmers.

| [Scenario 2](#) | [Scenario 3](#) | [Scenario 4](#) | [Scenario 5](#) |