Case Study #5: Grain Farm Expansion - The Cash Farm

Alternate Scenarios

This fictional Case Study featuring Bob and Ellen Cash 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 – rent 4 quarter, upgrade harvesting equipment, add bins

Scenario 3 – purchase 4 quarter, upgrade harvesting equipment, add bins

Scenario 4 – rent 8 quarters, upgrade all equipment, add bins, add labor

Scenario 5 – Sensitivity analysis: price, yield, expenses – 2.5% change, 5% change

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 Action Plan is to:

- Add just the 4 quarters (620 cultivated acres) of rented land, and not purchase the additional 4 quarters of land
- Update the harvesting equipment at a cost of $100,000, not invest $300,000 in equipment as originally considered
- Purchase $50,000 worth of bins instead of $100,000 worth

Everything else is kept the same as in the original scenario.

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

After Change Projection (Year 1)

Income (April 1, 2016 - March 31, 2017)					Expenses (April 1, 2016 - March 31, 2017)	
Income					**Expense**	
Crop sales					Cropping expense	980,950
wheat	71,250	x	5.50	391,875	Overhead expense	43,720
canola	48,438	x	10.00	484,375	Operating interest	13,324
barley	102,375	x	4.10	419,738	Term interest	47,800
Total				1,295,988	**Total Cash Expense**	1,085,794
					Non Cash Expense	
Other income					Depreciation	88,000
Gov't programs				0	Exp. side acc. adj.	(990)
Custom work				10,000	**Total Non Cash Expense**	87,010
Other				7,500		
Total				17,500	**Total Accrued Expense**	1,172,805
					Net Accrued Farm Inc.	190,945
					Non farm income	0
					Living costs	66,000
					Income tax	30,000
Total Cash Income				1,313,488		
					Debt Service Capacity	230,746
Inc. side accrual adjustments				50,263	(Net acc. farm inc. + depreciation	
					+ term interest + non farm income	
Total Accrued Income				1,363,750	- living costs - income tax)	

Profitability Ratios:	
Debt Service Ratio:	1.27
Return on Assets: (see Note)	3.23%
Return on Equity: (see Note)	2.95%
Max. operating loan required:	533,651

Payments:	
Principal	133,932
Interest	47,800
Total	181,732

Closing Financial Ratios:	
Current Ratio	1.11
Debt to Equity Ratio	0.32
Equity Ratio	0.76

Note: Return on Assets and Equity as shown assume returns after Living Costs and Income Tax.

After Change Projection (Year 2)

Income (April 1, 2017 - March 31, 2018)				
Income				
Crop sales				
wheat	75,000	x	5.50	412,500
canola	47,251	x	10.00	472,505
barley	112,500	x	4.10	461,250
Total				1,346,255
Other income				
Gov't programs				0
Custom work				10,000
Other				7,500
Total				17,500
Total Cash Income				1,363,755
Inc. side accrual adjustments				(5)
Total Accrued Income				1,363,750

Expenses (April 1, 2017 - March 31, 2018)	
Expense	
Cropping expense	980,950
Overhead expense	43,720
Operating interest	13,190
Term interest	42,463
Total Cash Expense	1,080,323
Non Cash Expense	
Depreciation	81,680
Exp. side acc. adj.	(1,012)
Total Non Cash Expense	80,668
Total Accrued Expense	1,160,991
Net Accrued Farm Inc.	202,759
Non farm income	0
Living costs	66,000
Income tax	32,000
Debt Service Capacity	228,902
(Net acc. farm inc. + depreciation + term interest + non farm income - living costs - income tax)	

Profitability Ratios:	
Debt Service Ratio:	1.26
Return on Assets: (see Note)	3.38%
Return on Equity: (see Note)	3.15%
Max. operating loan required:	492,682

Payments:	
Principal	138,700
Interest	42,463
Total	181,164

Closing Financial Ratios:	
Current Ratio	1.21
Debt to Equity Ratio	0.27
Equity Ratio	0.78

Note: Return on Assets and Equity as shown assume returns after Living Costs and Income Tax.

Some comments about these results are as follows:

- Net accrued income improves in this Scenario, relative to the original change scenario, mainly because the interest cost for the purchase of the additional land, and much of the additional depreciation to be incurred in the original scenario will not exist in this case.
- Debt Service Capacity is reduced in this Scenario, but the payment requirement is significantly less, leaving a much improved Debt Service Ratio.
- Cash flow demand and operating loan requirements would be less in this case compared to the original change scenario as the scale of operations would be reduced when the 4 quarters of land to purchase are excluded.

- All other financial risk indicators are improved in this scenario relative to the original. As a result, the farm business is less vulnerable to lower crop prices and/or rising input costs going forward.

| Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5 |

Scenario 3: The Action Plan –

In this scenario, the Action Plan is to:

- Add just the 4 quarters (600 cultivated acres) of purchased at a cost of $1,800,00 land, and not rent the additional 4 quarters (620 cultivated acres). The full purchase would be financed over 20 years
- Update the harvesting equipment at a cost of $100,000 as in Scenario 2
- Purchase $50,000 worth of bins as in Scenario 2

Everything else is kept the same as in the original scenario.

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

After Change Projection (Year 1)

Income (April 1, 2016 - March 31, 2017)						Expenses (April 1, 2016 - March 31, 2017)	
Income						**Expense**	
Crop sales						Cropping expense	927,310
wheat	71,250	x	5.50	391,875		Overhead expense	48,600
canola	48,438	x	10.00	484,375		Operating interest	14,164
barley	101,025	x	4.10	414,203		Term interest	110,250
	Total			1,290,453		**Total Cash Expense**	1,100,324
						Non Cash Expense	
Other income						Depreciation	88,000
Gov't programs				0		Exp. side acc. adj.	-1,002
Custom work				10,000		**Total Non Cash Expense**	86,998
Other				10,000			
	Total			20,000		**Total Accrued Expense**	1,187,322
						Net Accrued Farm Inc.	171,548
						Non farm income	0
						Living costs	66,000
						Income tax	25,000
Total Cash Income				1,310,453			
						Debt Service Capacity	278,798
Inc. side accrual adjustments				48,418		(Net acc. farm inc. + depreciation	
						+ term interest + non farm income	
Total Accrued Income				1,358,870		- living costs - income tax)	

Profitability Ratios:	
Debt Service Ratio:	0.91
Return on Assets: (see Note)	3.01%
Return on Equity: (see Note)	2.50%
Max. operating loan required:	568,248

Payments:	
Principal	197,382
Interest	110,250
Total	307,632

Closing Financial Ratios:	
Current Ratio	0.81
Debt to Equity Ratio	0.75
Equity Ratio	0.57

Note: Return on Assets and Equity as shown assume returns after Living Costs and Income Tax.

After Change Projection (Year 2)

Income (April 1, 2017 - March 31, 2018)					Expenses (April 1, 2017 - March 31, 2018)	
Income					**Expense**	
Crop sales					Cropping expense	927,310
wheat	75,000	x	5.50	412,500	Overhead expense	48,600
canola	47,251	x	10.00	472,505	Operating interest	17,192
barley	110,700	x	4.10	453,870	Term interest	102,673
Total				1,338,875	**Total Cash Expense**	1,095,775
					Non Cash Expense	
Other income					Depreciation	81,680
Gov't programs				0	Exp. side acc. adj.	-1,025
Custom work				10,000	**Total Non Cash Expense**	80,655
Other				10,000		
Total				20,000	**Total Accrued Expense**	1,176,430
					Net Accrued Farm Inc.	182,440
					Non farm income	0
					Living costs	66,000
					Income tax	27,000
Total Cash Income				1,358,875		
					Debt Service Capacity	273,792
Inc. side accrual adjustments				-5	(Net acc. farm inc. + depreciation	
					+ term interest + non farm income	
Total Accrued Income				1,358,870	- living costs - income tax)	

Profitability Ratios:	
Debt Service Ratio:	0.89
Return on Assets: (see Note)	3.12%
Return on Equity: (see Note)	2.70%
Max. operating loan required:	606,964

Payments:	
Principal	204,391
Interest	102,673
Total	307,063

Closing Financial Ratios:	
Current Ratio	0.74
Debt to Equity Ratio	0.70
Equity Ratio	0.59

Note: Return on Assets and Equity as shown assume returns after Living Costs and Income Tax.

Some comments about these results are as follows:

- The financial results are similar in this scenario relative to the original change scenario (where land was purchased and rented), but weaker than in Scenario 2 where only the rented land was added
- Debt Service Ratio is, as well, similar in this scenario to the original scenario, but much weaker than in Scenario 2, where additional debt would not be incurred for land purchase
- Cash flow demand and operating loan requirements would be slightly more in this scenario than Scenario 2, mainly because of the cash requirement for payment on the land loan relative to the land rental payment

- Generally, the financial risk indicators are weak in this Scenario due to the financial leveraging required with the additional financing, and payment requirement for the additional debt.

| Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5 |

Scenario 4: The Action Plan –

In this scenario, the Action Plan is to:

- Add all the land being offered (1270 acres in total with 1220 acres cultivated), but on all on a rental basis, instead of part purchased and part rented
- Upgrade equipment as in the original scenario at a cost of $300,000
- Add grain storage as in the original scenario at a cost of $100,000
- Acquire the additional labour required to farm the extra land at an additional cost of $20,000/year

In summary, this scenario is the same as the original scenario, except that the 4 quarters to be purchased at a cost of $1,800,000 will now be rented at an annual cost of $48,000.

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

After Change Projection (Year 1)

Income (April 1, 2016 - March 31, 2017)					Expenses (April 1, 2016 - March 31, 2017)	
Income					**Expense**	
Crop sales					Cropping expense	1,190,800
wheat	90,000	x	5.50	495,000	Overhead expense	48,920
canola	50,000	x	10.00	500,000	Operating interest	15,312
barley	125,000	x	4.10	512,500	Term interest	56,996
	Total			1,507,500	**Total Cash Expense**	1,312,027
					Non Cash Expense	
Other income					Depreciation	105,000
Gov't programs				0	Exp. side acc. adj.	(996)
Custom work				10,000	**Total Non Cash Expense**	104,004
Other				11,500		
	Total			21,500	**Total Accrued Expense**	1,416,031
					Net Accrued Farm Inc.	193,969
					Non farm income	0
					Living costs	66,000
					Income tax	30,000
Total Cash Income				1,529,000		
					Debt Service Capacity	259,965
Inc. side accrual adjustments				81,000	(Net acc. farm inc. + depreciation	
					+ term interest + non farm income	
Total Accrued Income				1,610,000	- living costs - income tax)	

Profitability Ratios:	
Debt Service Ratio:	1.17
Return on Assets: (see Note)	3.30%
Return on Equity: (see Note)	3.02%
Max. operating loan required:	655,081

Payments:	
Principal	165,129
Interest	56,996
Total	222,125

Closing Financial Ratios:	
Current Ratio	1.00
Debt to Equity Ratio	0.38
Equity Ratio	0.72

Note: Return on Assets and Equity as shown assume returns after Living Costs and Income Tax.

After Change Projection (Year 2)

Income (April 1, 2017 - March 31, 2018)

Income				
Crop sales				
wheat	90,000	x	5.50	495,000
canola	54,000	x	10.00	540,000
barley	135,000	x	4.10	553,500
Total				1,588,500
Other income				
Gov't programs				0
Custom work				10,000
Other				11,500
Total				21,500
Total Cash Income				1,610,000
Inc. side accrual adjustments				0
Total Accrued Income				1,610,000

Expenses (April 1, 2017 - March 31, 2018)

Expense	
Cropping expense	1,190,800
Overhead expense	48,920
Operating interest	15,908
Term interest	50,416
Total Cash Expense	1,306,044
Non Cash Expense	
Depreciation	97,380
Exp. side acc. adj.	(1,019)
Total Non Cash Expense	96,361
Total Accrued Expense	1,402,404
Net Accrued Farm Inc.	207,596
Non farm income	0
Living costs	66,000
Income tax	33,000
Debt Service Capacity	256,392

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

Profitability Ratios:	
Debt Service Ratio:	1.16
Return on Assets: (see Note)	3.48%
Return on Equity: (see Note)	3.26%
Max. operating loan required:	629,264

Payments:	
Principal	171,140
Interest	50,416
Total	221,556

Closing Financial Ratios:	
Current Ratio	1.04
Debt to Equity Ratio	0.33
Equity Ratio	0.75

Note: Return on Assets and Equity as shown assume returns after Living Costs and Income Tax.

Some comments about these results are as follows:

- Operationally in this scenario, the farm is the same as in the original change scenario where 4 quarters of land were purchased and 4 rented. In this scenario, however, all the land is rented. Comparing this scenario to Scenario 2 where only 4 of the quarters are rented and none purchased, net income is somewhat improved, as is Debt Service Capacity.
- Cash flow demands and operating loan requirement are again higher in this scenario, as the scale of operation is significantly increased.
- Some of the financial risk indicators are somewhat marginal in this Scenario due to the financial additional debt, and payment requirement associated with the additional equipment and bins purchase and financing. The Debt Service Ratio is 1.16, and the closing Current Ratio is 1.04

which are generally considered to be weak. The closing Debt to Equity Ratio is .33, however, which is generally felt to show a strong equity position in the operation.

| **Scenario 2** | **Scenario 3** | **Scenario 4** | **Scenario 5** |

Scenario 5: The Action Plan –

In this scenario, the Action Plan is to continue with the operation as at present, except concentrate on gaining efficiencies in the areas of production, input costs and pricing as follows:

- In Year 1:
    - Increase yields by 2.5%
    - Improve crop prices by 2.5%
    - Decrease cost of seed, fertilizer and chemical by 2.5%
- In Year 2:
    - Increase yields by 5%
    - Improve crop prices by 5%
    - Decrease cost of seed, fertilizer and chemical by 5%

In all other respects, the farm will continue as before any changes were implemented. Instead of increasing the scale of production, the Cashes will focus on improving production and prices received for their crops, and through more timely and efficient purchasing, reduce costs of their inputs.

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

After Change Projection (Year 1)

(Assuming inrease yield and price 2.5%, decrease input cost 2.5%)

Income April 1, 2016 - March 31, 2017)				
Income				
Crop sales				
wheat	61,500	x	5.64	346,706
canola	39,206	x	10.25	401,864
barley	95,018	x	4.20	399,311
Total				1,147,881
Other income				
Gov't programs				0
Custom work				10,000
Other				6,500
Total				16,500
Total Cash Income				1,164,381
Inc. side accrual adjustments				0
Total Accrued Income				1,164,381

Expenses (April 1, 2016 - March 31, 2017)	
Expense	
Cropping expense	778,881
Overhead expense	40,220
Operating interest	9,914
Term interest	41,180
Total Cash Expense	870,194
Non Cash Expense	
Depreciation	79,000
Exp. side acc. adj.	-1,565
Total Non Cash Expense	77,435
Total Accrued Expense	947,629
Net Accrued Farm Inc.	216,752
Non farm income	0
Living costs	66,000
Income tax	35,000
Debt Service Capacity	235,932
(Net acc. farm inc. + depreciation + term interest + non farm income - living costs - income tax)	

Profitability Ratios:	
Debt Service Ratio:	1.46
Return on Assets: (see Note)	3.70%
Return on Equity: (see Note)	3.54%
Max. operating loan required:	380,917

Payments:	
Principal	120,023
Interest	41,180
Total	161,203

Closing Financial Ratios:	
Current Ratio	1.23
Debt to Equity Ratio	0.27
Equity Ratio	0.79

Note: Return on Assets and Equity as shown assume returns after Living Costs and Income Tax.

After Change Projection (Year 2)

(Assuming inrease yield and price 5%, decrease input cost 5%)

Income April 1, 2017 - March 31, 2018)					Expenses (April 1, 2017 - March 31, 2018)	
Income					**Expense**	
Crop sales					Cropping expense	769,841
wheat	63,000	x	5.78	363,825	Overhead expense	40,220
canola	40,163	x	10.50	421,706	Operating interest	6,875
barley	97,335	x	4.31	419,027	Term interest	36,437
Total				1,204,558	**Total Cash Expense**	853,374
					Non Cash Expense	
Other income					Depreciation	73,340
Gov't programs				0	Exp. side acc. adj.	-1,606
Custom work				10,000	**Total Non Cash Expense**	71,734
Other				6,500		
Total				16,500	**Total Accrued Expense**	925,108
					Net Accrued Farm Inc.	295,951
					Non farm income	0
					Living costs	66,000
					Income tax	50,000
Total Cash Income				1,221,058		
					Debt Service Capacity	289,728
Inc. side accrual adjustments				0	(Net acc. farm inc. + depreciation	
					+ term interest + non farm income	
Total Accrued Income				1,221,058	- living costs - income tax)	

Profitability Ratios:	
Debt Service Ratio:	1.80
Return on Assets: (see Note)	4.98%
Return on Equity: (see Note)	5.18%
Max. operating loan required:	313,253

Payments:	
Principal	124,197
Interest	36,437
Total	160,634

Closing Financial Ratios:	
Current Ratio	1.94
Debt to Equity Ratio	0.21
Equity Ratio	0.82

Note: Return on Assets and Equity as shown assume returns after Living Costs and Income Tax.

Some comments about these results are as follows:

- In this scenario the Cashes are focusing on improving efficiencies instead of production. It is assumed no assets need to be purchased to accomplish this (however that could be possible), rather extra management effort, and development of skills to accomplish the gains desired.
- Assuming these efficiencies can be achieved, the results are quite remarkable, because the gains all go directly to the bottom line. At the 2 years looked at, and the gains considered, the net financial improvements are:
    - In Year 1, with 2.5% improvements projected in each of the 3 areas (compared to "Before Change"):

      Net accrued income: + $64,664, +42.5%
      Debt Service Capacity: + $51,664, +28.0%
      Debt Service Ratio: + .32 (1.14 to 1.42)

    - In Year 2, with 5% improvements projected in each of the 3 areas (compared to "Before Change"):

      Net accrued income: + $143,843, +94.6%
      Debt Service Capacity: + $105,440, +57.2
      Debt Service Ratio: + .66 (1.14 to 1.80)
- All other financial indicators improve significantly under this scenario as well. Over time, and with the accumulation of the increase profits, the Current Ratio and Debt to Equity Ratio improve, and the operating loan requirement drops
- Of all the scenarios considered, this one, especially when the 5% incremental changes are achieved, shows the best overall financial results.

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 |