Case Study #2: Pre-Succession Beginning Farmer - The Wheat Farm

Alternate Scenarios

This fictional Case Study featuring Tyler and Chrystal Wheat 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 – buy home quarter, rent 9 quarters, buy founder's equipment

Scenario 3 – buy home quarter, rent 3 quarters, buy half of founder's equipment

Scenario 4 – buy home quarter, rent 3 quarters, buy half of founder's equipment, custom spray

Scenario 5 – buy home quarter, buy $100,00 of equipment, continue to work off farm

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, Tyler and Chrystal will purchase Bill and Edna's equipment instead of renting it as in the original Scenario. In all other respects, the Plan remains the same:

- Tyler and Chrystal will purchase the home quarter for $600,000 using bank financing. Bill and Edna will use the money to build a new home on an adjoin quarter they will keep.
- Tyler and Chrystal will rent the remaining 9 quarters of land Bill and Edna own, however, 3 of the quarters (the land they will inherit eventually) will be rent free. The rent on the remaining 6 quarters will be slightly reduced.
- Tyler and Chrystal will purchase Bill and Edna's equipment line for $950,000, the present estimated market value. Bill and Edna will finance the purchase over 15 years at 0% interest.
- Bill and Edna will continue to farm the ½ section they rent. They will pay Tyler and Chrystal $20,000 per year back for equipment usage as long as they continue to do so.
- Tyler will reduce his non farm employment to part time and will earn about $10,000 per year after taxes and deductions. Chrystal will continue on with her employment as at present.

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

After Change Projection (Year 1)

Income (Jan 1 - Dec 31, 2016)						**Expenses (Jan 1 - Dec 31, 2016)**	
Income						**Expense**	
Crop sales						Cropping expense	501,930
wheat	30,000	x	5.50	165,000		Overhead expense	12,100
canola	16,000	x	10.00	160,000		Operating interest	6,793
barley	30,000	x	4.10	123,000		Term interest	28,342
Total				448,000		**Total Cash Expense**	549,165
						Non Cash Expense	
Other income						Depreciation	82,800
Gov't programs				5,000		Exp. side acc. adj.	1,844
Custom work				20,000		**Total Non Cash Expense**	84,644
Other				5,000			
Total				30,000		**Total Accrued Expense**	633,809
						Net Acc. Farm Income	70,786
						Net wages	30,000
						Living costs	45,000
						Income tax	5,000
Total Cash Income				478,000			
						Debt Service Capacity	161,928
Inc. side accrual adjustments				226,595		(Net acc. farm inc. + depreciation	
						+ term interest + non farm income	
Total Accrued Income				704,595		- living costs - income tax)	

Profitability Ratios:	
Debt Service Ratio:	1.29
Return on Assets:	2.94%
Return on Equity:	8.61%
Max. operating loan required:	280,861

Payments	
Principal	96,757
Interest	28,342
Total	125,099

Closing Financial Ratios:	
Current Ratio	0.87
Debt to Equity Ratio	6.52
Equity Ratio	0.13

After Change Projection (Year 2)

Income (Jan 1 - Dec 31, 2017)					
Income					
Crop sales					
wheat	39,900	x	5.50	219,450	
canola	25,650	x	10.00	256,500	
barley	48,450	x	4.10	198,645	
Total				674,595	
Other income					
Gov't programs				5,000	
Custom work				20,000	
Other				5,000	
Total				30,000	
Total Cash Income				704,595	
Inc. side accrual adjustments				0	
Total Accrued Income				704,595	

Expenses (Jan 1 - Dec 31, 2017)	
Expense	
Cropping expense	501,930
Overhead expense	12,100
Operating interest	5,805
Term interest	33,539
Total Cash Expense	553,374
Non Cash Expense	
Depreciation	81,176
Exp. side acc. adj.	(168)
Total Non Cash Expense	81,008
Total Accrued Expense	634,382
Net Acc. Farm Income	70,213
Net wages	30,000
Living costs	45,000
Income tax	5,000
Debt Service Capacity	164,928
(Net acc. farm inc. + depreciation + term interest + non farm income - living costs - income tax)	

Profitability Ratios:	
Debt Service Ratio:	1.18
Return on Assets:	2.97%
Return on Equity:	7.22%
Max. operating loan required:	218,783

Payments	
Principal	106,723
Interest	33,539
Total	140,263

Closing Financial Ratios:	
Current Ratio	0.96
Debt to Equity Ratio	5.21
Equity Ratio	0.16

Notes on Return on Assets and Equity:

- ***the percentage returns shown above are after living costs are paid. Before living costs and interest on the house portion of the debt, the returns on assets and equity are:***
  - ***Return on Assets = 7.79%***
  - ***Return on Equity = 27.10%***

Some comments about these results are as follows:

1. In this scenario, the operation is unchanged from a production standpoint, so projected revenue is the same is in the original case. Net income declines however, as the increased depreciation in the initial years resulting from the purchase of the parents' equipment in the initial years is greater than what they were going to pay for rent.
2. Debt service capacity in this scenario is higher than in Scenario 1, but the payments are higher as well. The budget surplus (difference between Debt Service Capacity and Payments) is similar in both cases. With the higher amount of payments relative to payment capacity, the Debt Service Ratio is lower in this scenario indicating a higher repayment risk.
3. In this scenario, the relationship of equity to assets is lower as well resulting in a lower equity ratio, again indicating a higher level of financial risk.
4. Operating loan requirements in this Scenario are similar in this scenario to the original case.
5. Overall, the results in this scenario are similar to the original case except that in this scenario, Tyler and Chrystal will be carrying more of the risk as reflected in the Current Ratio, Equity Ratio and Debt Service Ratio.

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

Scenario 3: The Action Plan –

In this scenario, Tyler and Chrystal will farm only the land they presently own, the quarter they presently rent, the home quarter with they will buy, and the land from the parents that is rent free. With the reduced operations, they will need only part of Bill and Edna's equipment. They will continue to rent equipment to the parents as in the Base scenario. Tyler will still work part time, but more than if they were farming the complete operation.

- Tyler and Chrystal will purchase the home quarter for $600,000 using bank financing. Bill and Edna will use the money to build a new home on an adjoining quarter they will keep.
- Tyler and Chrystal will farm only their owned quarter, their rented quarter, the home quarter they are purchasing and the 3 quarters that will be rent free (the land they will inherit eventually).
- Tyler and Chrystal will purchase only part of Bill and Edna's equipment line for $500,000, the present estimated market value. Bill and Edna will finance the purchase over 15 years at 0% interest. Bill and Edna will sell the rest of their equipment.
- Bill and Edna continue to farm the ½ section they rent. They will pay Tyler and Chrystal $20,000 per year back for equipment usage as long as they continue to do so.
- Tyler will reduce his non farm employment to part time and will earn about $20,000 per year after taxes and deductions (compared to $10,000 in the original scenario and Scenario 2). Chrystal will continue on with her employment as at present.

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

After Change Projection (Year 1)

Income (Jan 1 - Dec 31, 2016)					Expenses (Jan 1 - Dec 31, 2016)	
Income					**Expense**	
Crop sales					Cropping expense	229,210
wheat	10,000	x	5.50	55,000	Overhead expense	8,100
canola	8,400	x	10.00	84,000	Operating interest	1,837
barley	15,000	x	4.10	61,500	Term interest	28,342
Total				200,500	**Total Cash Expense**	267,489
					Non Cash Expense	
Other income					Depreciation	46,800
Gov't programs				3,000	Exp. side acc. adj.	1,844
Custom work				20,000	**Total Non Cash Expense**	48,644
Other				3,000		
Total				26,000	**Total Accrued Expense**	316,133
					Net Acc. Farm Income	53,082
					Net wages	50,000
					Living costs	45,000
					Income tax	5,000
Total Cash Income				226,500		
					Debt Service Capacity	128,224
Inc. side accrual adjustments				142,715	(Net acc. farm inc. + depreciation	
					+ term interest + non farm income	
Total Accrued Income				369,215	- living costs - income tax)	

Profitability Ratios:	
Debt Service Ratio:	1.35
Return on Assets:	2.48%
Return on Equity:	2.68%
Max. operating loan required:	116,918

Payments	
Principal	66,757
Interest	28,342
Total	95,099

Closing Financial Ratios:	
Current Ratio	0.93
Debt to Equity Ratio	4.81
Equity Ratio	0.17

After Change Projection (Year 2)

Income (Jan 1 - Dec 31, 2017)

Income				
Crop sales				
wheat	20,300	x	5.50	111,650
canola	13,050	x	10.00	130,500
barley	24,650	x	4.10	101,065
Total				343,215
Other income				
Gov't programs				3,000
Custom work				20,000
Other				3,000
Total				26,000
Total Cash Income				369,215
Inc. side accrual adjustments				0
Total Accrued Income				369,215

Expenses (Jan 1 - Dec 31, 2017)

Expense	
Cropping expense	229,210
Overhead expense	8,100
Operating interest	1,358
Term interest	33,539
Total Cash Expense	272,207
Non Cash Expense	
Depreciation	43,056
Exp. side acc. adj.	-168
Total Non Cash Expense	42,888
Total Accrued Expense	315,095
Net Acc. Farm Income	54,120
Net wages	50,000
Living costs	45,000
Income tax	5,000
Debt Service Capacity	130,715
(Net acc. farm inc. + depreciation + term interest + non farm income - living costs - income tax)	

Profitability Ratios:	
Debt Service Ratio:	1.19
Return on Assets:	2.56%
Return on Equity:	2.56%
Max. operating loan required:	81,751

Payments	
Principal	76,723
Interest	33,539
Total	110,263

Closing Financial Ratios:	
Current Ratio	1.05
Debt to Equity Ratio	3.81
Equity Ratio	0.21

Notes on Return on Assets and Equity:

- ***the percentage returns shown above are after living costs are paid. Before living costs, the returns on assets and equity are:***
  - ***Return on Assets = 5.20%***
  - ***Return on Equity = 13.54%***

Some comments about these results are as follows:

6. In this scenario, operations are significantly scaled back, less debt is incurred and a higher level of non farm income is maintained.
7. Farm profitability is reduced somewhat in this scenario, along with capacity to service debt, however, the debt service requirement is much less.
8. With the lower level of debt, financial risk is much reduced in this scenario compared to scenario 2.
9. The projections suggest that Tyler and Chrystal can earn more farming the extra rented land than the extra income Tyler would earn working more as in the scenario, however, the debt service requirement in owning and financing all the equipment creates significantly more payments.
10. Operationally, this scenario is likely less risky than both the original alternative and Scenario #2. With the larger acreages involved in those alternatives, if price or yields become less than projected, net income and ability to service debt would be more severely impacted.
11. Financial performance in this option is projected to be satisfactory, but with less opportunity for significant gains if things go well than in the first 2 alternatives.

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

Scenario 4: The Action Plan –

In this scenario, Tyler and Chrystal will farm the land they presently own, the quarter they presently rent, the home quarter, which they will buy, and the land from the parents that is rent free. They will purchase only part of Bill and Edna's equipment. Tyler will now purchase a sprayer and do custom spraying instead of working off farm part time.

- Tyler and Chrystal purchase the home quarter for $600,000 using bank financing. Bill and Edna will use the money to build a new home on an adjoining quarter they will keep.
- Tyler and Chrystal farm only their owned quarter, their rented quarter, the home quarter they are purchasing and the 3 quarters that will be rent free (the land they will inherit eventually).
- Tyler and Chrystal purchase only part of Bill and Edna's equipment line for $500,000, the present estimated market value. Bill and Edna will finance the purchase over 15 years at 0% interest. Bill and Edna will sell the rest of their equipment.
- Bill and Edna continue to farm the ½ section they rent. They will pay Tyler and Chrystal $20,000 per year back for equipment usage as long as they continue to do so.
- Tyler will end his present employment, and will instead purchase a good, used high clearance sprayer, trailer and tanks to do custom spraying in the spring and fall. He will use the farm's tandem grain truck to pull the sprayer and trailer, and haul the water tanks. He will trade in the farm's present sprayer. Cost difference is estimated to be about $160,000, which he will finance over 5 years. Projected net income from this custom spraying enterprise after fuel, repairs and hired labour is $60,000/year (included in farm income as custom spraying). Chrystal will continue on with her employment as at present.

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

After Change Projection (Year 1)

Income (Jan 1 - Dec 31, 2016)					Expenses (Jan 1 - Dec 31, 2016)	
Income					**Expense**	
Crop sales					Cropping expense	229,210
wheat	10,000	x	5.50	55,000	Overhead expense	8,100
canola	8,400	x	10.00	84,000	Operating interest	1,150
barley	15,000	x	4.10	61,500	Term interest	31,852
Total				200,500	**Total Cash Expense**	270,312
					Non Cash Expense	
Other income					Depreciation	46,800
Gov't programs				3,000	Exp. side acc. adj.	3,189
Custom work (father)				20,000	**Total Non Cash Expense**	49,989
Custom spraying				60,000		
Other				3,000	**Total Accrued Expense**	320,301
Total				86,000	**Net Acc. Farm Income**	108,914
					Net wages	30,000
					Living costs	45,000
					Income tax	10,000
Total Cash Income				286,500		
					Debt Service Capacity	162,566
Inc. side accrual adjustments				142,715	(Net acc. farm inc. + depreciation + term interest + non farm income - living costs - income tax)	
Total Accrued Income				429,215		

Profitability Ratios:	
Debt Service Ratio:	1.41
Return on Assets:	5.42%
Return on Equity:	19.22%
Max. operating loan required:	110,228

Payments	
Principal	83,233
Interest	31,852
Total	115,085

Closing Financial Ratios:	
Current Ratio	0.85
Debt to Equity Ratio	4.81
Equity Ratio	0.17

After Change Projection (Year 2)

Income (Jan 1 - Dec 31, 2017)					Expenses (Jan 1 - Dec 31, 2017)	
Income					**Expense**	
Crop sales					Cropping expense	229,210
wheat	20,300	x	5.50	111,650	Overhead expense	8,100
canola	13,050	x	10.00	130,500	Operating interest	785
barley	24,650	x	4.10	101,065	Term interest	39,589
Total				343,215	**Total Cash Expense**	277,684
					Non Cash Expense	
Other income					Depreciation	57,456
Gov't programs				3,000	Exp. side acc. adj.	(454)
Custom work				20,000	**Total Non Cash Expense**	57,002
Custom spraying				60,000		
Other				3,000	**Total Accrued Expense**	334,686
Total				86,000	**Net Acc. Farm Income**	94,529
					Net wages	30,000
					Living costs	45,000
					Income tax	8,000
Total Cash Income				429,215		
					Debt Service Capacity	168,574
Inc. side accrual adjustments				0	(Net acc. farm inc. + depreciation	
					+ term interest + non farm income	
Total Accrued Income				429,215	- living costs - income tax)	

Profitability Ratios:	
Debt Service Ratio:	1.12
Return on Assets:	4.77%
Return on Equity:	12.26%
Max. operating loan required:	77,247

Payments	
Principal	110,646
Interest	39,589
Total	150,235

Closing Financial Ratios:	
Current Ratio	0.94
Debt to Equity Ratio	3.64
Equity Ratio	0.22

Notes on Return on Assets and Equity:

- ***the percentage returns shown above are after living costs are paid. Before living costs, the returns on assets and equity are:***
  - ***Return on Assets = 7.14%***
  - ***Return on Equity = 21.08%***

Some comments about these results are as follows:

12. In this scenario, as in Scenario #3, farm production operations are significantly scaled back, however, now the operations are expanded in the area of custom work.
13. Profitability and debt service capacity are strong in this scenario, however, debt service requirement is high also due to the proposed debt for the spraying equipment. Payments are less in Year 1 as only 1 payment on the sprayer will be made in the first year, resulting in a higher Debt Service Ratio. The numbers in Year 2 reflect the normal long term situation.
14. In this scenario, operational risk is likely higher than for Scenario #3 because of the uncertainty of the custom work income, however, it is spread over 2 enterprises which normally lessens risk overall. While lower prices and yields might reduce the amount of custom work available, they should not impact on income as much as when a larger crop acreage is involved.
15. Financial performance in this option, with the returns projected, appears to be satisfactory, but marginal, until the sprayer loan is paid off, as the custom spraying enterprise comes with significant debt. Financing the sprayer equipment over 7 years instead of 5 would improve the Debt Service Ratio. As well, if more custom work is obtained, the results would improve dramatically.
16. The custom spraying enterprise could cause some time conflicts with the farming enterprise in that the spraying would normally be done during busy times in the farming operation. On the other hand, Tyler would have more free time during the off season months to pursue other business management activities such as marketing, training and seminars, and possibly other activities such as machinery repair and some non farm work. This might compensate somewhat for the reductions in farm income resulting from time conflicts during the summer months. These considerations have not been accounted for in the projections done, but could be.

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

Scenario 5: The Action Plan –

In this scenario, Tyler and Chrystal will farm only the land they will own and the quarter they presently rent. They will now live in the buildings on the home quarter, will expand their present equipment line somewhat, and have their harvesting custom done.

- Tyler and Chrystal will purchase the home quarter for $600,000 using bank financing. Bill and Edna will use the money to build a new home on an adjoining quarter they will keep.
- Tyler and Chrystal will farm only their owned quarter, their rented quarter, and the home quarter they are purchasing from Tyler's parents
- Tyler and Chrystal will purchase only the essential items out of Bill and Edna's equipment line for $100,000, the present estimated market value. Bill and Edna will finance the purchase over 15 years at 0% interest. Bill and Edna will sell the rest of their equipment. This will give Tyler and Chrystal all the equipment they need for this reduced operation except for equipment for harvesting which they will have custom done.
- Bill and Edna will terminate their farming operations. They will sell the remainder of their equipment and rent their land out.
- Tyler will continue with his full time employment and operate the farm in his spare time. Chrystal will continue on with her employment as at present.

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

After Change Projection (Year 1)

Income (Jan 1 - Dec 31, 2016)					**Expenses (Jan 1 - Dec 31, 2016)**	
Income					**Expense**	
Crop sales					Cropping expense	135,150
wheat	7,500	x	5.50	41,250	Overhead expense	8,100
canola	5,500	x	10.00	55,000	Operating interest	962
barley	7,000	x	4.10	28,700	Term interest	28,342
Total				124,950	**Total Cash Expense**	172,554
					Non Cash Expense	
Other income					Depreciation	14,800
Gov't programs				2,000	Exp. side acc. adj.	1,844
Other				2,000	**Total Non Cash Expense**	16,644
Total				4,000		
					Total Accrued Expense	189,198
					Net Acc. Farm Income	(7,673)
					Net wages	60,000
					Living costs	45,000
					Income tax	0
Total Cash Income				128,950		
					Debt Service Capacity	50,469
Inc. side accrual adjustments				52,575	(Net acc. farm inc. + depreciation	
					+ term interest + non farm income	
Total Accrued Income				181,525	- living costs - income tax)	

Profitability Ratios:	
Debt Service Ratio:	0.74
Return on Assets:	-1.40%
Return on Equity:	-20.59%
Max. operating loan required:	58,094

Payments	
Principal	40,090
Interest	28,342
Total	68,432

Closing Financial Ratios:	
Current Ratio	0.74
Debt to Equity Ratio	4.06
Equity Ratio	0.20

After Change Projection (Year 2)

Income (Jan 1 - Dec 31, 2017)					Expenses (Jan 1 - Dec 31, 2017)	
Income					**Expense**	
Crop sales					Cropping expense	135,150
wheat	10,500	x	5.50	57,750	Overhead expense	8,100
canola	6,750	x	10.00	67,500	Operating interest	2,110
barley	12,750	x	4.10	52,275	Term interest	33,539
Total				177,525	**Total Cash Expense**	178,899
					Non Cash Expense	
Other income					Depreciation	13,616
Gov't programs				2,000	Exp. side acc. adj.	(168)
Other				2,000	**Total Non Cash Expense**	13,448
Total				4,000		
					Total Accrued Expense	192,347
					Net Acc. Farm Income	(10,822)
					Net wages	60,000
					Living costs	45,000
					Income tax	0
Total Cash Income				181,525		
					Debt Service Capacity	51,333
Inc. side accrual adjustments				0	(Net acc. farm inc. + depreciation	
					+ term interest + non farm income	
Total Accrued Income				181,525	- living costs - income tax)	

Profitability Ratios:	
Debt Service Ratio:	0.61
Return on Assets:	-1.59%
Return on Equity:	-21.48%
Max. operating loan required:	90,525

Payments	
Principal	50,057
Interest	33,539
Total	83,596

Closing Financial Ratios:	
Current Ratio	0.62
Debt to Equity Ratio	3.93
Equity Ratio	0.20

Notes on Return on Assets and Equity:

- ***the percentage returns shown above are after living costs are paid. Before living costs, the returns on assets and equity are:***
  - ***Return on Assets = 1.92%***
  - ***Return on Equity = -3.50%***

Some comments about these results are as follows:

17. This scenario is largely an extension of the Base situation, and has Tyler and Chrystal purchasing the parents' home quarter to become their residence instead of the home they rent in town. The payments required to service the debt required is partially offset by the rent they would now not need to pay, and the additional income they would be able to make off this additional land. As they would no longer have access to Tyler's parents equipment, they would need to purchase some additional items, and now have some of the work custom done.
18. Farm profitability in this case is slightly negative in both years because interest on all debt is included in expenses. Even with full time employment now for Tyler, debt service capacity will be less than payment requirements because of the high resulting payments. In Year 3 payments will drop a bit because in that year the truck loan will be paid off, but repayment capacity will still be insufficient.
19. This scenario is marginal or inadequate in all financial respects. As noted, debt service capacity is insufficient to make payments in the long term, assuming financial performance is as projected. They would be highly leveraged in that they would be carrying a heavy debt load relative to their assets. Their payments would be structured in such a way that they would not see significant payment relief for several years. If revenues and expenses occur as expected, they should gain slight amounts of equity over time, but very likely in insufficient amounts for them to hope to graduate this farm from a part time operation to a viable farming business.
20. Overall, Tyler and Chrystal can't afford to purchase their parent's quarter under this scenario. If they want to purchase it, they should consider one of the other scenarios.

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 |