

CASE STUDIES IN FARM MANAGEMENT

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ABSTRACT

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Previous research on teaching methods in economics demonstrates the need for active learning. The use of case studies is one way to fill that need. Two case studies are developed; they can be used to give students experience in applying farm management concepts to real farm management decisions.

Students are given the opportunity to analyze an expansion decision at a typical North Dakota cash crop farm. Students also evaluate a producer's marketing strategies, develop marketing plans, and make recommendations for the future. Teaching notes are included to provide guidance for the instructor. The case studies are expected to provide an effective addition to traditional teaching methods.

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INTRODUCTION

In teaching farm management principles, many economic tools are provided to students. The expectation is that, through learning how to use the tools in a classroom format, students will know how to apply these tools in real-world farm management situations. Becker and Watts (2001) reported that the most common teaching method for economics is the “chalk-n-talk” lecture method. While lecture does provide students with the necessary information for solving problems, it does little to help them solve real economic problems because actual decision-making is more complex.

There is a gap in problem-solving knowledge when it comes to applying economic tools to real-world situations. Although surveys of student achievement over past years have shown increases in the awareness of problem-solving tools, students have continued to show poor results when faced with using problem-solving skills to make conclusions. At the same time, students have been expected to be fast learners when starting their careers, but their lack of problem-solving skills has made many of them fall short of expectations. These issues have sparked new attempts at helping students to improve their problem-solving skills (Williams 1992).

For example, many courses in commodity marketing stress the importance of a written marketing plan. Without classroom experience in writing marketing plans, many students may not be able to effectively implement marketing tools that they have been taught. Research on the marketing performance of soybean farmers in Benton County, Indiana, shows the value of marketing experience. Farmers who were familiar with the mechanics of futures markets received 3.9% higher prices than those who were not. Farmers with high levels of marketing knowledge, as perceived by their elevator managers,

received 6.5% higher prices than their lower-knowledge counterparts (Hurt, Slusher, and McCormick 1991), demonstrating the value of marketing knowledge in real-world farm management situations.

Students need to be provided with opportunities to actively participate in the application of economic theory in order to ensure the development of problem-solving skills. The most effective results from education are often a result of active involvement in projects and discussions. In order for students to develop excellent problem-solving skills, teaching methods that are beyond the basic lecture method need to be explored. One of these methods is the use of case studies (Carlson and Schodt 1995).

A quality case study is “a powerful catalyst for enhancing attainment of higher-order educational outcomes such as critical thinking, problem solving, and decision making” (Stanford et al. 1992, p. v). A case study can be defined as “an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (Yin 1994, p. 33). Case studies are used to show how a decision-making process may evolve and what effects the decision may have on stakeholders. Case studies will lead the reader on an expedition through the decision-making process while seeing the situation through the eyes of the decision maker (Gross Davis 1993).

A case study fills the gap by applying tools to real-world situations. It is very effective because the students find it “relevant, exciting, and understandable” (Harling and Misser 1998, p. 1). It is also useful in answering “how” and “why” questions (Yin 1994, p. 1). A case study develops a situation in which economic theory is put into practice by the students to solve an economic problem (Carlson and Schodt 1995). The attributes of a

decision-based case study show the ability of a case study to fill the problem-solving knowledge gap.

Results from the Integrated Management of Cropping Systems (ANPL 5060) class at the University of Minnesota show the effectiveness of teaching with case studies. Students were asked to rate themselves for the following course objectives, skills, and competencies: solving problems, making judgments and decisions, working as a team, describing and defending decisions, and understanding of management principles in cropping systems. The ratings were collected both pre-course and post-course. The ratings increased by an average of 28% from pre-course to post-course. In particular, the ratings for problem solving ability and making judgments and decisions each increased by an average of 36% (Stanford et al. 1992).

Carlson and Schodt implemented the use of case studies into their economics classes and used student surveys to evaluate the results. According to the results of their study, “Students were unequivocal in their perception that the use of cases had contributed to their learning.” In addition, “The students are emphatically positive and are convinced that cases help them to learn economics” (Carlson and Schodt 1995, p. 27). The results of their study illustrated that the use of case studies in their classrooms is an effective method for improving student achievement in the field of economics.

The results from the reviewed studies show how teaching with case studies can enhance students’ problem-solving abilities. The use of case studies is one way of applying active learning methods in the classroom. Decision-based case studies require students to apply problem solving skills rather than just relying on passive learning by the students. Because of their experience with case studies, students are better prepared for

solving problems in their future careers (Silverman, Welty, and Syon 2000). Active learning methods have been proven in the classroom, and employers of active learning methods are more than willing to provide guidance to others who wish to apply the methods in their own classrooms (DeVuyst and DeVuyst 2006).

The results from the ANPL 5060 course at the University of Minnesota demonstrate the effectiveness of teaching with decision-based case studies in a crop sciences course (Stanford et al. 1992). The results from the study by Carlson and Schodt show the benefits of teaching with case studies in economics. More research could be performed to evaluate the effectiveness of teaching with case studies, specifically in the field of Agricultural Economics. While similar results can be expected, the results may actually be more strongly in favor of teaching with case studies in agricultural economics than in economics or crop sciences. This could be due to the wide variety and complexity of tools that students are given to work with in agricultural economics, often with little practice employing the tools in actual situations.

In addition to research demonstrating the value of case studies, more case studies need to be written. This will allow an instructor, wanting to give students practice using a particular tool or analyzing a particular situation, the ability to find a case study to fit their needs. As more case studies are made available, the more likely it is that an instructor will be able to find a high-quality case study to fit their needs. Two such decision-based case studies are developed and exhibited here for those reasons.

Background

Dr. Eric DeVuyst is the instructor for the Agribusiness and Applied Economics 420 course titled “Integrated Farm and Ranch Management” at North Dakota State University.

Students in the course are formed into teams which meet with agricultural producers in North Dakota and northwest Minnesota. When meeting with the producers, the student team, instructor, and producer discuss the producer's management style, goals, and concerns. Financial records are collected; all identifiers are removed; and the student team then develops a complete financial analysis of the farm or ranch. The student team also analyzes the producer's management style and identifies key management issues.

The management issues that are the focus of the two case studies in this paper were derived from actual farm management situations in the AGEC 420 reports. The actual producer names had already been eliminated from the information before the 420 reports were completed; therefore, pseudonyms were used to identify the people in the case studies. The actual financial information taken from the 420 reports was then disguised in the case studies to preserve anonymity. This was accomplished by multiplying all financial information by a certain factor (i.e., 1.75 or 0.75). The key management issues, however, remained intact.

In "Farming for the Future: Expansion Decision at Triple F Farms," students will be challenged to distinguish between farm size goals and financial goals. The case study is designed to give students practice in evaluating management issues. The case study also requires students to build proforma income statements and balance sheets, as well as analyze the potential financial outcomes of a farm expansion opportunity.

In "Farming for the Future: Profitable Marketing at Triple F Farms," students will have the opportunity to evaluate the producer's commodity marketing strategies and develop recommendations for the future. Students will be required to develop written marketing plans for risk management and income enhancement. They will also be

provided with a framework that can be used to evaluate the potential results of a marketing plan. They will then be able to evaluate their written marketing plans.

Both case studies require that the students have knowledge of financial statements and financial analyses as well as the ability to address management issues. The case studies may be adapted for beginning-level to senior-level courses based on the amount of information provided by the instructor. When properly utilized, these case studies will allow students to be thorough in their analyses of the situations.

The case studies will be most successfully taught in conjunction with lecture and written assignments on the pertinent topics (Carlson and Schodt 1995). Students will most likely work in teams over an extended period of several days to weeks. Lectures within the period will give students the necessary tools for solving the problems and provide opportunities for questions and feedback.

TRIPLE F FARMS

Craig, owner of Triple F Farms, farms 2,600 acres. He owns 180 acres, and the rest is cash rented. He and his wife Cathy raise sugar beets, corn, dry edible beans, soybeans, and spring wheat in the Red River Valley. The valley is located along both sides of the Red River, which forms the border between North Dakota and Minnesota. The valley is known for its deep, fertile, rock-free soils as well as its short and unpredictable growing season; it is notorious for floods, drought, and frost.

Craig grew up on his father Allan's farm. Allan did everything he could to make farming a career possibility for Craig, but Allan's farm did not have enough income to support two families. It was Cathy's father who had a sufficiently large enough farm to bring Craig into the business. After marrying Cathy, Craig began to work on his father-in-law's farm. The farm is only 10 miles from Allan's farm, so Craig was already familiar with the farming practices. In 1995, Cathy's father retired, leaving Craig as the owner and manager. While the size of Triple F Farms is not much larger than when Cathy's father was farming, Craig has diversified the farm by adding sugar beets and edible beans, both high-value crops, to the rotation.

Craig owns a modest line of machinery. He has owned most items for at least seven years, with the exception of a few recently purchased items. He purchased a new pull-type sprayer in the summer of 2002 so that he could do more of his own spraying. He also bought two large triple-axle grain trucks that same summer which enhance his ability to get the sugar beets and corn out of the fields in a timely fashion. He has been able to keep costs down by doing his own maintenance and putting in long hours on his machinery. Coupled with his solid yield averages and management abilities he has been

able to have an average annual net income of \$80,000. After covering family living expenses and term debt principal payments, Craig and Cathy save the additional funds for retirement. Craig's balance sheet as of December 31, 2005, is shown in Table 1.

Table 1. Balance Sheet 12/31/2005

BALANCE SHEET					
Triple F Farms					
12/31/2005					
Current Assets	Cost	Market	Current Liabilities		
Cash	150,000	150,000	Accrued interest on:		
Savings	21,000	21,000	non-current liabilities (schedule 1)	11,000	
Bonds & securities	28,000	42,000	Principal due within 12 months on:		
Prepaid Expenses	5,100	5,100	non-current liabilities (schedule 1)	23,000	
Supplies	15,000	15,000	Accrued tax liabilities:		
Crop Inventory	227,250	227,250	Income tax	38,368	
			Deferred tax on current assets	65,714	
Total Current Assets	446,350	460,350	Total Current Liabilities	138,082	
Non-Current Assets			Non-Current Liabilities		
Machinery & Buildings			(Principal due beyond 12 months)		
Cost or basis	505,612		Notes (schedule 1)	114,200	
Accumulated depreciation	444,412		Real Estate Mortgages (schedule 1)	41,800	
Value	61,200	535,612	Deferred tax on non-current assets	187,058	
Investment in cooperatives	151,000	226,000	Total Non-Current Liabilities	343,058	
Real Estate	81,000	135,000	Total Liabilities	481,140	
			Owner Equity:	Cost	Market
Total Non-Current Assets	293,200	896,612	Retained Earnings	258,410	258,410
			Valuation Equity		617,412
			Total Owner Equity	258,410	875,822
			Total Liabilities		
Total Assets	739,550	1,356,962	and Owner Equity	739,550	1,356,962

Schedule 1 - Non-Current Liabilities

Date	Purpose	Due Date	Interest Rate	Current		Portion of Principal	
				Principal Balance	Accrued Interest	Due within 12 months	Due beyond 12 months
NOTES:							
7/1/2002	Machinery	7/1/2009	8%	59,000	2,400	13,000	46,000
1/1/1996	Beet Stock	1/1/2016	7%	60,000	4,200	4,300	55,700
1/1/2003	Vehicles	1/1/2010	8%	15,000	1,200	2,500	12,500
			Total	134,000	7,800	19,800	114,200
REAL ESTATE MORTGAGES:							
1/1/1996	Land	1/1/2016	7%	45,000	3,200	3,200	41,800
			Total	45,000	3,200	3,200	41,800

Craig lives on the farm with Cathy and their two children, ages 10 and 12. Cathy had an off-farm job before the children were born but has been at home caring for the children and helping Craig with the farm ever since. They want to maintain their current lifestyle while considering changes to the farm business. The farm's income has been sufficient in the past, but Craig realizes that more income may be necessary in the future. "When our children reach college age we may need an additional \$20,000 per year. We also want to set aside \$10,000 more per year for retirement," Craig says. With those needs in mind, he has set a goal of increasing his annual net income to \$110,000 within five years. In addition, he wants to have a farm with enough income potential for at least one of his children to join the business in the future.

Another concern of Craig's is related to shrinking profit margins due to the rising costs for fuel and fertilizer. Craig says that in 2005 alone, "My fertilizer costs increased by 25%," with similar increases in the costs for fuel and oil. The rising costs were in part due to sharp increases in prices for natural gas, which is a major input in the production of many commercial fertilizers. In addition, rising crude oil prices were directly responsible for higher fuel and oil costs on Craig's farm.

Crop Operations at Triple F Farms

The corn, soybeans, and wheat crops are grown using practices that are familiar to most grain farmers. Craig uses conventional tillage on all of his crops. He grows 450 acres of conventional hybrid corn, 650 acres of public wheat varieties, and 900 acres of soybeans that are genetically modified to be tolerant to glyphosate. Portions of the crop are hauled directly to local grain elevators at harvest. The remainders of the wheat, corn, and soybean crops are placed in on-farm storage to be delivered and sold at a later date.

The 150 acres of sugar beets are grown for a farmer-owned cooperative in the Red River Valley of Minnesota and North Dakota. Farmers, like Craig, buy shares in the company. Each share represents one acre of sugar beets that the farmer is required to grow and deliver to the company. The machinery for planting and caring for the crop is the same as what Craig uses for his other row crops; however, the harvesting machinery is quite unique. First, a tractor pulls a defoliator, or topper, through the field, which removes the crop's above-ground leaves and stem. Another tractor follows with a beet harvester, or lifter, which pulls the beets out of the ground and elevates them into trucks. With average yields of around 20 tons per acre on Craig's farm, the trucking is much more intense than for other crops. The harvest is also very labor intensive, as the harvest continues 24 hours a day until it is finished. The harvest takes place in the first part of October, when the beets are cool enough to be piled outdoors without fear of spoilage. The beets are then processed by the cooperative before the next summer. The price that Craig receives for his sugar beets is determined by the cooperative.

The 450 acres of edible beans that Craig grows are primarily pinto beans. Pinto beans are often used in burritos and tacos and can be served in the whole or refried form. The crop is a legume, like soybeans, and has low requirements of nitrogen fertilizer. Edible beans are a food crop; therefore, a cool and dry harvest season is necessary in order to harvest a high-quality crop. The fall weather in the Northern Plains usually allows such a harvest. The machinery required for growing these beans is very similar to that of other row crops, with the exception of some of the harvesting equipment. Pinto bean pods lay very close to the ground when mature. Straight-cut combine headers cause too much crop loss for Craig. For this reason, a special tractor-mounted machine is used to cut the

ground-hugging plants' stems just below the surface of the ground and collect several rows together into windrows. Craig is then able to use the same combine that he uses for his wheat, corn, and soybeans, with the use of a windrow-pickup header. The pinto beans are delivered directly to local buyers during harvest, as specialized equipment is required to handle the fragile beans. The buyer of Craig's pinto beans does allow him to price up to 50% of the beans before harvest. He is also allowed to delay the pricing of up to 25% of his beans after harvest for up to 12 months at no charge. The remainder is priced at harvest.

Craig makes a point of being well-educated when it comes to his crop input needs. He likes to be in control of the decisions instead of relying on an agronomist for decision-making, though he is not afraid to ask for advice. He bases his seed purchasing decisions on area yield trials and prior results on his own farm. He keeps a close eye on the chemical needs for each field and uses the product that will give the return on investment. He always soil tests his fields for fertilizer needs and follows the university recommendations for each crop.

Craig insures his crops using Revenue Assurance Crop Insurance at the 70% coverage level. This provides him with a guarantee that he will receive compensation from his insurance company if his yields fall below 70% of his actual production history, which is an average of his yields for the previous five years. Revenue Assurance Crop Insurance replaces lost production at the harvest value. This allows Craig to manage production risk if he chooses to do any pre-harvest pricing. He can use pre-harvest pricing on up to 70% of his actual production history without exposing himself to additional production risk.

EXPANSION OPPORTUNITY AT TRIPLE F FARMS

Thoroughly enjoying the crisp Monday afternoon, Craig watches as the pile of wheat in the box of his truck slowly grows. A brief trip to the cab of the truck to move it ahead as the box fills is all that is required of him, as the grain auger is doing all of the heavy work. He spends the idle minutes sitting on the foundation of the next bin, listening for any imperfections in the steady drone of the grain auger. He watches his two children, ages 10 and 12, playing on the snow pile in the middle of the farmyard. With the children less than fifty yards away, he can watch them while he is working, giving his wife Cathy a well-deserved break. It is days like this December afternoon that he realizes the value of working at home and being his own boss. He wants to maintain his profitability into the future so that he can continue to enjoy days like this.

Financial Management of Triple F Farms

Craig uses his farm records from previous years when building his crop budgets and proforma income statement. He then uses this information to build a proforma balance sheet for the end of the upcoming year. He uses five-year averages when building his crop budgets, and adjusts for any expected changes in the coming year. Craig's five-year crop revenue history is reported in Table 2. His direct crop expenses are given in Table 3.

Annual revenue from government programs for all crops at Triple F Farms totals \$39,375. Expenses other than direct crop input costs are: \$36,500 for repairs, \$161,250 for land rent, \$6,000 for farm insurance, \$6,375 for utilities, \$33,250 for fuel and oil, \$14,700 for depreciation, and \$24,650 for interest. Craig usually estimates his projected income tax liability by multiplying the net farm income from operations by an estimated tax rate of 31%.

Table 2. Crop Yield and Price History

Crop	Sugar Beets	Corn	Edible Beans	Soybeans	Spring Wheat
Yield (per acre)	tons	bushels	hundredweight	bushels	bushels
2001	20.5	138.5	13.5	39.0	56.5
2002	19.5	144.5	15.0	42.5	42.0
2003	22.0	146.5	11.0	39.5	52.0
2004	21.5	133.5	14.0	30.5	59.0
2005	19.0	152.0	16.5	33.5	40.5
Price (\$ per unit)					
2001	34.00	1.91	17.10	4.71	3.09
2002	33.00	1.92	14.00	5.01	3.53
2003	34.50	1.80	14.60	6.40	3.43
2004	37.00	1.89	20.60	5.82	3.45
2005	36.50	1.98	15.20	5.46	3.50

Table 3. Direct Expenses by Crop (\$ per acre)

	Sugar Beets	Corn	Edible Beans	Soybeans	Spring Wheat
Seed	45	28	26	35	7
Fertilizer	36	29	9	8	27
Chemicals	110	24	30	8	25
Crop Insurance	10	10	15	8	4
Drying		20			
Custom Hire	30				
Hired Labor	35	16	12	10	9

Craig likes to talk to his neighbors over breakfast at the local café. The farmers typically talk about the weather and markets. They also tend to talk about other farmers and the size of their farms. The larger farmers are generally regarded as being the most successful with their large collections of machinery, buildings, and equipment. Most of the farmers would like to expand the size of their farm if they had the opportunity. The most recent discussions have revolved around rumors that the prices for fuel and fertilizer might increase by 25 to 50% within five years. Craig is wondering if farm expansion will be necessary in order to maintain his level of income.

The Expansion Opportunity

Having completed most of his recordkeeping for 2005, Craig will be able to spend the rest of the month hauling grain and preparing for next year. As the owner of Triple F Farms, he spends a good portion of his time planning the future of his operation. He has also been wondering what he can do to achieve his goals and address his concerns. Several years ago he chose to name his farm “Triple F Farms”; the three F’s signifying his motto, which is “Farming for the Future”. He had no idea that he would be facing the kind of decision that he is facing today.

Craig’s father Allan has decided that 42 years of farming is enough. With the equity that he has built up over the years, he can retire at age 67. By selling all of his farm assets, he will have enough income for him and his wife of 45 years to live comfortably for the rest of their lives. The decision to sell everything has been made. Allan and his wife want to dissolve themselves of all responsibilities so that they can travel. He wants to be able to sell to Craig, at a price that is fair to both of them, but only if it is the right move for his son.

While Allan’s farm was not large enough to allow Craig to enter the operation at the time when he was getting started, it has since grown so that it is almost as large as Triple F Farms. Allan’s farm is 2,200 acres, and he owns half of those acres. He grew mostly spring wheat and soybeans, with a few acres of corn and dry edible beans. He has a line of machinery that is mostly newer than Craig’s and wants to sell all of it as a package for \$450,000. Craig feels that buying the complete line of machinery will make him certain that he has enough machinery for the higher acres. “I also look at it as a way to get some newer machinery on my farm,” says Craig. Allan will sell the 1,100 acres that he

owns for \$750 per acre. He feels \$750 is a reasonable price, as some land auctions in the area have fetched prices of over \$1,000 per acre. Craig would also take over the 1,100 acres that Allan rents at \$65 per acre, for a total acreage increase of 2,200 acres. These additional acres would nearly double the size of Triple F Farms to 4,800 acres.

Craig's plan would be to increase all of his crop acres proportionately in the expansion since he has been successful with his existing crop rotation. The increase in sugar beet acres would require the purchase of an additional 100 shares of sugar beet stock. Craig has talked to a retiring farmer and was told that he could purchase 100 shares at a price of \$1,500 per share. This brings the total cost of the expansion to \$1,425,000.

The Financial Plan for Expansion

Allan will be selling his farmstead to another party on January 1, 2006. He also plans to complete the sale of his farmland and machinery by December 30, 2005. Craig would use his cash on hand to pay 10% down on all of the acquisitions, leaving the remainder to be financed. The total down payment would be \$142,500.

Craig has talked to his local bank about borrowing money for the machinery and beet stock. He was told that the machinery would be placed on a 7-year note. The beet stock would be a 20-year note. Craig plans on getting a 20-year mortgage from Farm Credit Services for the land purchase. He expects that the interest rates would be fixed at 7% for all of the new loans. The loan payments would be due on December 30th each year. The new loan for the machinery would have annual principal payments of \$45,000 and interest payments of \$25,000. The loan for the new beet stock would have annual principal payments of \$4,000 and interest payments of \$8,700 for a total payment of \$12,700. The loan for the new land would have annual principal payments of \$22,000 with interest

payments of \$48,000 for a total payment of \$70,000. The interest payments would decrease each year and the principle payments would increase each year while the total payments would remain constant.

Over the years, Craig has built his equity in the business to a level of just over \$875,000 with working capital of almost \$325,000. That level of working capital allows him to keep his borrowed operating funds needed per year at \$300,000. If he chooses to expand the farm, the borrowed operating funds he needs will increase to \$550,000. He pays off the operating note by the end of each year. He estimates the operating interest expense to be \$11,250. The estimate is \$20,625 if he chooses to expand the farm. An end of year balance sheet for 2005 that includes the potential new purchases and new debt is shown in Table 4. Craig uses a tax rate of 31% when estimating his deferred tax liability.

The cropping plan would be very similar to last year if Craig decides to expand the farm, with acreage increases in all crops. He plans to increase the crop acres to 250 acres of beets, 800 of corn, 800 of edible beans, 1,750 of soybeans, and 1,200 acres of spring wheat. He expects all direct crop input costs to increase directly with the increase in acres as well as the total cost for repairs, farm insurance, utilities, fuel, and oil. Craig's real estate tax liabilities would increase dramatically with the increase in the number of owned acres. He estimates real estate taxes would be \$8 per acre. His costs for land rent would not increase as dramatically due to the fact that half of the new land would be owned. His financing costs would increase disproportionately due to the new interest costs associated with the land and machinery purchases. His interest expense for term debt and mortgages is currently \$13,400 per year and would increase to \$95,100 if he chose to expand. The depreciation expense would also increase dramatically due to the new machinery

purchases. The new machinery would be depreciated using a seven-year straight line schedule with a salvage value of zero.

Table 4. Balance Sheet 12/31/2005 with Expansion

		BALANCE SHEET			
		Triple F Farms			
		12/31/2005 (Expansion)			
		Cost	Market	Current Liabilities	
Current Assets					
Cash		7,500	7,500	Accrued interest on:	
Savings		21,000	21,000	non-current liabilities (schedule 1) 11,000	
Bonds & securities		28,000	42,000	Principal due within 12 months on:	
Prepaid Expenses		5,100	5,100	non-current liabilities (schedule 1) 99,000	
Supplies		15,000	15,000	Accrued tax liabilities:	
Crop Inventory		227,250	227,250	Income tax 38,368	
				Deferred tax on current assets 65,714	
				Total Current Liabilities 214,082	
Total Current Assets		303,850	317,850		
Non-Current Assets				Non-Current Liabilities	
Machinery & Buildings				(Principal due beyond 12 months)	
Cost or basis	955,612			Notes (schedule 1) 600,200	
Accumulated depreciation	444,412			Real Estate Mortgages (schedule 1) 762,300	
Value	511,200	985,612		Deferred tax on non-current assets 272,308	
Investment in cooperatives	301,000	376,000		Total Non-Current Liabilities 1,634,808	
Real Estate	906,000	1,235,000		Total Liabilities 1,848,890	
				Owner Equity: Cost Market	
				Retained Earnings 173,160 173,160	
				Valuation Equity 892,412	
Total Non-Current Assets	1,718,200	2,596,612		Total Owner Equity 173,160 1,065,572	
				Total Liabilities and Owner Equity 2,022,050 2,914,462	
Total Assets	2,022,050	2,914,462			

Schedule 1 - Non-Current Liabilities

Date	Purpose	Due Date	Interest Rate	Current		Portion of Principal	
				Principal Balance	Accrued Interest	Due within 12 months	Due beyond 12 months
NOTES:							
7/1/2002	Machinery	7/1/2009	8%	59,000	2,400	13,000	46,000
1/1/1996	Beet Stock	1/1/2016	7%	60,000	4,200	4,300	55,700
1/1/2003	Vehicles	1/1/2010	8%	15,000	1,200	2,500	12,500
12/30/2005	Dad's Machinery	12/30/2012	7%	405,000	0	50,000	355,000
12/30/2005	New Beet Stock	12/30/2025	7%	135,000	0	4,000	131,000
			Total	674,000	7,800	73,800	600,200
REAL ESTATE MORTGAGES:							
1/1/1996	Land	1/1/2016	7%	45,000	3,200	3,200	41,800
12/30/2005	Dad's Land	12/30/2025	7%	742,500	0	22,000	720,500
			Total	787,500	3,200	25,200	762,300

The Expansion Decision

When the truck is full, Craig embarks on the 16-mile round trip to the elevator and back home. By the end of the day he has hauled six loads. With about 15,000 bushels of wheat left to haul in order to fill his December delivery contract he needs to spend several more days hauling grain. While finishing this task he will be mulling over the expansion decision.

Craig needs to know what his net income might be if he chooses to expand. He also wants to see what his balance sheet might look like at the end of 2006 for the two different options. When he talked to his banker, he was told that there are five key ratios that he needs to calculate: Current Ratio, Equity/Asset Ratio, Return on Equity, Net Farm Income from Operations Ratio, and Term Debt Coverage Ratio. Those five ratios will be used in a credit-scoring model to determine Craig's credit score. The credit score will influence the interest rate that the bank would charge and ultimately the decision as to whether or not the loan will be approved. In addition to providing the ratios for use in the credit scoring model, Craig wants to know what the ratios mean for his farm and how they may affect his decision.

Craig often seeks management advice from his closest neighbor, Jeremy. Jeremy has recently graduated from college with training in farm management. While discussing the potential cost increases for fuel and fertilizer, Jeremy suggested that Craig needs to include a sensitivity analysis in his proforma analysis. When Craig asked what that meant, Jeremy described to him how to conduct a sensitivity analysis and what the results will mean for his farm. Craig has decided that a sensitivity analysis will be necessary in order to determine the potential effects of cost increases of 25% to 50% for fuel and fertilizer on

his farm. He also realizes the value of comparing and contrasting the results of a proforma analysis between the two possible farm sizes.

While discussing the possible farm expansion Craig mentioned that most farmers would choose to expand if they had the opportunity. He feels that he would be doing the wrong thing if he did not expand. Jeremy told Craig that there is a difference between farm size goals and financial goals. Craig had told him about his financial goal of increasing his net income to \$110,000 and Jeremy reminded him that his focus should be on whether or not the farm expansion will help him to achieve his financial goal. Craig believes that an expansion of his farm will help him reach his goal.

He has to get the analysis done quickly, since he only has a few weeks before Allan will sell the farm. In order to be ready in time, he needs to have the analysis done by the end of this week. When those data needs are filled, he can make his decision and finish his grain hauling chores for 2005.

INSTRUCTOR NOTES FOR EXPANSION OPPORTUNITY

The focus of this case study is making a critical and timely business decision for a farm family. The question facing Triple F Farms is whether to expand the size of the farm with an increase of 2,200 acres. The purpose of the case study is to demonstrate the difference between farm size goals and financial goals. The producer in the case has set a financial goal and the students will be asked to determine the best decision to help the producer achieve the goal. Most of the analysis by the students will be quantitative along with some qualitative analysis of potential effects on the decision maker.

Specific tasks for the students may include the following questions and answers:

1. Using the information given in the case study construct proforma income statements for the two different farm sizes for the 2006 crop year. Also build the two different proforma balance sheets for December 31, 2006. What is the projected net income for each of the two options? What is the projected net worth of the farm at the end of 2006 for each of the two options?
 - The projected net income will be \$80,842 if the farm is kept the same and \$84,580 if the farm is expanded. The proforma income statements for the two options are shown in Table 5. All expenses increased proportionately with the increase in number of acres with the exception of interest expense, depreciation, real estate taxes, land rent, and income tax expense.
 - The interest expense is calculated as follows: The total operating funds needed for the farm is \$300,000. This is then multiplied by an annual interest rate of 7.5% and divided by two to reflect the assumption that the average operating

Table 5. Proforma Income Statements, 1/1/2006 Through 12/31/2006

Revenue	No Expansion	Expansion
Sugar Beets	\$107,625	\$179,375
Corn	\$122,265	\$217,360
Edible Beans	\$102,690	\$182,560
Soybeans	\$172,827	\$336,053
Spring Wheat	\$110,500	\$204,000
Government Payments	\$39,375	\$72,692
Total Revenue	\$655,282	\$1,192,040
Expenses		
Seed	\$67,100	\$124,100
Fertilizer	\$47,250	\$85,800
Chemicals	\$64,250	\$114,700
Crop Insurance	\$22,550	\$41,300
Drying	\$9,000	\$16,000
Custom Hire	\$4,500	\$7,500
Hired Labor	\$32,700	\$59,450
Repairs	\$36,500	\$67,385
Land Rent	\$161,250	\$232,750
Real Estate Taxes	\$1,440	\$10,240
Farm Insurance	\$6,000	\$11,077
Utilities	\$6,375	\$11,769
Interest	\$24,650	\$115,725
Fuel & Oil	\$33,250	\$61,385
Depreciation	\$14,700	\$78,986
Total Expenses	\$531,515	\$1,038,166
Net Farm Income from Operations	\$123,767	\$153,873
Change in Deferred Taxes	\$4,557	\$21,592
Change in Accrued Income Tax		\$9,333
Income Taxes Paid	\$38,368	\$38,368
Net Income	\$80,842	\$84,580
Cash Flows		
Cash Farm Revenue	\$655,282	\$1,192,040
Cash Farm Expense	\$516,815	\$959,180
Income Taxes Paid	\$38,368	\$38,368
Term Debt Principal Payments	\$23,000	\$99,000
Family Living Withdrawals	\$60,000	\$60,000
Net Cash Increase (decrease)	\$17,099	\$35,492

dollar borrowed would be repaid in six months. This gives an operating interest expense of \$11,250. The interest expense for the expanded operating debt is calculated in a similar fashion. The total operating funds needed is \$550,000 if the farm is expanded for an operating interest expense of \$20,625. In both cases, the operating debt is paid off by December 31, 2006. The operating interest expense is then added to the interest expense for term debt and mortgages to get the total interest expense.

- The only items that are still being depreciated without the farm expansion are the pull-type sprayer, grain trucks, and the farm buildings. The total depreciation expense without the farm expansion is \$14,700. The new machinery is depreciated using a seven-year straight line schedule with a salvage value of zero, increasing the total depreciation expense to \$78,986.
- The income taxes paid are \$38,368 in both cases, because the income taxes are paid on the income in 2005 which was not affected by the expansion. The accrued income tax, however, is higher for the expanded farm due to the higher income. The accrued income taxes are estimated by multiplying the net farm income from operations by an estimated income tax rate of 31%.
- Real estate taxes increase by \$8,800 which is the 1,100 new acres times \$8 per acre. Land rent increases by \$71,500 which is the 1,100 new rented acres times \$65 per acre.
- The net worth at the end of 2006 will be approximately \$910,000. It will be \$1.17 million if the farm is expanded. The end-of-year balance sheets for the two options are shown in Tables 6 and 7.

Table 6. Proforma Balance Sheet 12/31/2006

BALANCE SHEET							
Triple F Farms							
12/31/2006							
Current Assets		Cost	Market	Current Liabilities			
Cash		150,000	150,000	Accrued interest on:			
Savings		21,000	21,000	non-current liabilities (schedule 1)		11,000	
Bonds & securities		45,099	59,099	Principal due within 12 months on:			
Prepaid Expenses		5,100	5,100	non-current liabilities (schedule 1)		23,000	
Supplies		15,000	15,000	Accrued tax liabilities:			
Crop Inventory		227,250	227,250	Income tax		38,368	
				Deferred tax on current assets		65,714	
Total Current Assets		463,449	477,449	Total Current Liabilities		138,082	
Non-Current Assets				Non-Current Liabilities			
Machinery & Buildings				(Principal due beyond 12 months)			
Cost or basis	505,612			Notes (schedule 1)		94,400	
Accumulated depreciation	459,112			Real Estate Mortgages (schedule 1)		38,600	
Value		46,500	535,612	Deferred tax on non-current assets		191,615	
Investment in cooperatives		151,000	226,000	Total Non-Current Liabilities			
Real Estate		81,000	135,000	Total Liabilities			
				Owner Equity:		Cost	Market
Total Non-Current Assets		278,500	896,612	Retained Earnings		279,252	279,252
				Valuation Equity		632,112	
				Total Owner Equity		279,252	911,364
				Total Liabilities and Owner Equity			
Total Assets		741,949	1,374,061			741,949	1,374,061
Schedule 1 - Non-Current Liabilities							
				Current		Portion of Principal	
Date	Purpose	Due Date	Interest Rate	Principal Balance	Accrued Interest	Due within 12 months	Due beyond 12 months
NOTES:							
7/1/2002	Machinery	7/1/2009	8%	46,000	2,400	13,000	33,000
1/1/1996	Beet Stock	1/1/2016	7%	55,700	4,200	4,300	51,400
1/1/2003	Vehicles	1/1/2010	8%	12,500	1,200	2,500	10,000
			Total	114,200	7,800	19,800	94,400
REAL ESTATE MORTGAGES:							
1/1/1996	Land	1/1/2016	7%	41,800	3,200	3,200	38,600
			Total	41,800	3,200	3,200	38,600

Table 7. Proforma Balance Sheet 12/31/2006 with Expansion

BALANCE SHEET					
Triple F Farms					
12/31/2006 (Expansion)					
Current Assets		Cost	Market	Current Liabilities	
Cash		7,500	7,500	Accrued interest on:	
Savings		21,000	21,000	non-current liabilities (schedule 1)	11,000
Bonds & securities		63,492	77,492	Principal due within 12 months on:	
Prepaid Expenses		5,100	5,100	non-current liabilities (schedule 1)	99,000
Supplies		15,000	15,000	Accrued tax liabilities:	
Crop Inventory		227,250	227,250	Income tax	47,701
				Deferred tax on current assets	62,821
				Total Current	
Total Current Assets		339,342	353,342	Liabilities	220,522
Non-Current Assets				Non-Current Liabilities	
Machinery & Buildings				(Principal due beyond 12 months)	
Cost or basis	955,612			Notes (schedule 1)	526,400
Accumulated depreciation	523,398			Real Estate Mortgages (schedule 1)	737,100
Value		432,214	985,612	Deferred tax on non-current assets	296,793
Investment in cooperatives		301,000	376,000	Total Non-Current Liabilities	1,560,293
Real Estate		906,000	1,235,000	Total Liabilities	1,780,815
				Owner Equity:	
				Retained Earnings	Cost Market
					197,741 197,741
Total Non-Current Assets	1,639,214	2,596,612		Valuation Equity	971,398
				Total Owner Equity	197,741 1,169,138
				Total Liabilities	
Total Assets	1,978,556	2,949,954		and Owner Equity	1,978,556 2,949,954

Schedule 1 - Non-Current Liabilities

Date	Purpose	Due Date	Interest Rate	Current Principal Balance	Accrued Interest	Portion of Principal	
						Due within 12 months	Due beyond 12 months
NOTES:							
7/1/2002	Machinery	7/1/2009	8%	46,000	2,400	13,000	33,000
1/1/1996	Beet Stock	1/1/2016	7%	55,700	4,200	4,300	51,400
1/1/2003	Vehicles	1/1/2010	8%	12,500	1,200	2,500	10,000
12/30/2005	Dad's Machinery	12/30/2012	7%	355,000	0	50,000	305,000
12/30/2005	New Beet Stock	12/30/2025	7%	131,000	0	4,000	127,000
			Total	600,200	7,800	73,800	526,400
REAL ESTATE MORTGAGES:							
1/1/1996	Land	1/1/2016	7%	41,800	3,200	3,200	38,600
12/30/2005	Dad's Land	12/30/2025	7%	720,500	0	22,000	698,500
			Total	762,300	3,200	25,200	737,100

- The cash on hand is reduced on the balance sheets for the expanded farm because the money is used to make the 10% down payment on all of the new assets. Since Craig and Cathy save any additional cash left over for retirement, the net cash increase on the last line of the proforma income statement will be saved for retirement. There is \$17,099 projected to be left over after family living expenses and principal payments. That money will then be invested into new bonds and securities for retirement. The same action will be taken if the farm is expanded, with an investment amount of \$35,492.
- When entering the values in the balance sheet for the expansion, the machinery and beet stock have the same cost value as market value. However, the land has a cost value of \$750/ac with a market value of \$1,000/ac.
- The deferred tax on current assets decreases from \$65,714 to \$62,821 if the farm is expanded, because a portion of Craig's current assets are used to make the down payment. The deferred tax on non-current assets increases from \$191,615 to \$296,793 if the farm is expanded. This means that if Craig were to sell all of his assets, he would have a tax burden of up to \$359,614 due to gains in market values of his assets. This is an *important* component of the balance sheet, because the balance sheet is designed to show what Craig's net worth would be if he were to sell everything at that specific point in time.

2. What are the results for each of the five key ratios? How are the ratios calculated? How might the results affect Craig's decision for Triple F Farms?

- The results for each of the five ratios for both the base case and the expanded farm are shown in Table 8.
- The current ratio is a measure of liquidity. It is calculated by dividing the current assets by the current liabilities (Oltmans, Klinefelter, and Frey). The current ratio drops by over 50% with the farm expansion, from 3.46:1 to 1.60:1. This is a concern for Craig as his ability to remain liquid in a catastrophe would be greatly reduced.
- The equity/asset ratio describes how much of the farm assets are owned by the farm and how much is financed with credit. It is calculated by dividing the total farm equity by the total farm assets (Oltmans, Klinefelter, and Frey). The greater the equity/asset ratio, the more flexibility Craig has for obtaining credit and/or investing in new activities in the future. The equity/asset ratio drops from 0.66:1 to 0.40:1 if the farm is expanded. The equity/asset ratio in the expanded case is low enough that the financial health of the farm and the ability to obtain financing may be a concern in the future.
- The Return on Equity (ROE) describes how much money the farm earns each year as a percentage of its equity. It is calculated by subtracting the family living expense from the net farm income from operations (NFIO) and then dividing by the average total farm equity (Oltmans, Klinefelter, and Frey). The ROE increases from 0.07:1 to 0.08:1 with an expansion of Triple F Farms. While this measure of profitability does increase with the farm expansion, it is only because the NFIO increases more than Craig's equity in the business.

- The net farm income from operations (NFIO) ratio is a measure of efficiency for the farm. It is calculated by dividing the NFIO by the total revenue (Oltmans, Klinefelter, and Frey). The NFIO ratio drops from 0.19:1 to 0.13:1 if the farm is expanded because the net income does not increase as much as the total revenue. This loss of efficiency is due to the dramatic increase in interest and depreciation expenses for the expanded farm. If Craig chooses to expand the farm, his profit margins will be reduced.
- The term debt coverage ratio shows the ability of the farm to handle adverse financial stress and cover all debt obligations. It is calculated by first adding the depreciation expense and interest on term debt to the NFIO. Then the income tax expense and family living expenses are subtracted, and the remainder is divided by the annual scheduled principal and interest payments on term debt (Oltmans, Klinefelter, and Frey). The term debt coverage ratio is currently at a relatively safe level of 1.47:1, but is nearing dangerous territory if the farm is expanded. With a ratio of 1.18:1, there is not much “cushion” to continue to meet debt obligations in a poor year.

Table 8. Ratio Analysis

	No Expansion	Expansion
Current Ratio	3.46:1	1.60:1
Equity/Asset Ratio	0.66:1	0.40:1
Return on Equity	0.07:1	0.08:1
Net Farm Income from Operations Ratio	0.19:1	0.13:1
Term Debt Coverage Ratio	1.47:1	1.18:1

3. What are the results of the sensitivity analysis for the expense risk that Craig is concerned about? What information does the analysis provide Craig that can help him with his decision?

- The results of the sensitivity analysis are shown in Table 9. The potential increases in fuel and fertilizer costs have a much more dramatic effect on the net farm income from operations (NFIO) of the expanded farm than on the original farm.
- The results of the analysis show Craig what might happen to his net income if the café rumors prove to be correct. Craig needs to decide if he wants to use the analysis as evidence that he needs to look at other options besides farm size expansion.
- The results also indicate that not expanding and making no other changes may not be an effective plan. His net farm income from operations will not be as greatly affected as in the expanded case, but it is still affected enough to put his livelihood at risk.

Table 9. Sensitivity Analysis with Expansion

NFIO as a result of:	No Expansion	Expansion
A 25% increase in fuel and fertilizer costs	\$103,642	\$117,077
Change	\$(20,125)	\$(36,796)
Percent change	-16%	-24%
A 50% increase in fuel and fertilizer costs	\$83,517	\$80,281
Change	\$(40,250)	\$(73,592)
Percent change	-33%	-48%

4. Does the farm expansion option put Triple F Farms on a path to helping Craig achieve his income goal? What would you recommend to Craig?
- The projected increase in net income as a result of farm expansion does not set Craig on a path towards achieving his income goal of \$110,000.
 - The altered capital structure of the farm as a result of the farm expansion substantially decreases Craig's liquidity and solvency. This may hinder his ability to enter into other endeavors in the future. Craig needs to be able to invest in other opportunities in the future if he wants to meet his goals.
 - The farm expansion would increase the risk of substantial declines in net income that would be a result of increases in fuel and fertilizer costs. The increased risk is much larger than the reward from the slight increase in net income.
 - The increase in farm size would not give the increase in net income that Craig needs in order to reach his goal. Craig needs to understand that a larger farm may not necessarily create larger profits.
 - There is a difference between farm size goals and financial goals. Craig has set a financial goal for his net income. An increase in farm size will contribute very little to the achievement of his financial goal.
 - Craig needs to find other ways to increase his net income. Future income-enhancing opportunities may or may not involve farm expansion, but this current expansion opportunity is not what Craig needs.

5. This expansion decision is dependent on several assumptions. Name some of the assumptions that were part of this decision process. What could Craig do to replace those assumptions with factual information?
- Allan's land is located approximately ten miles from Craig's farm, and yields were assumed to be identical to those on Craig's farm. Craig should ask Allan for his historical yield data. If it is not available he could collect yield information from his crop insurance company. Soil types and drainage patterns would also be pertinent information. This information could also affect Craig's crop rotation plans, as Allan's land may be, for example, more suitable for corn and less suitable for sugar beets than Craig's land.
 - Production costs were assumed to be identical. Fertilizer costs could actually be quite different from Craig's due to different soil types and past fertility programs. Chemical expenses could also vary due to different weed pressures and past weed control programs. Information on soil types, Allan's fertility plan, and past weed control strategies could be compiled by Craig to determine if he needs to make adjustments to his crop budgets.
 - The availability of grain storage on Allan's farm was not discussed. This could affect Craig's marketing strategies, and ultimately the price received for his crops. It could also affect the timeliness of harvest operations. Craig needs to find out if there is storage available and estimate storage costs for any available storage.
6. A topic of discussion for more advanced students could be an analysis of the risks and rewards associated with the farm expansion opportunity as well as those

associated with the original farm. What are some potential sources of risk? What could be done to reduce those risks? How do those potential risks compare with the potential rewards?

- Changes in interest rates would have a significant impact on Craig's profitability. Craig could attempt to secure a low interest, fixed rate contract-for-deed from his father. Loans with fixed interest rates could be pursued to eliminate the risk associated with rising interest rates, but will also eliminate the rewards that would be a result of decreasing interest rates.
- Craig currently owns less than 10% of his farmland. The tenure risk associated with the rented land could have a large impact on this expansion decision. The purchase of his father's land would strengthen Craig's position and reduce the risk of losing a large percentage of his land due to a landlord renting or selling land to another party. In the short-run, however, Craig's rewards are greater from renting land than owning land.

7. Can you suggest other approaches to reaching Craig's financial goals?

- Craig might be able to rent the 1,100 acres that Allan rented without purchasing the other 1,100 acres. This would allow Craig to increase his net income with a lesser negative impact on his liquidity and solvency.
- Craig might be able to purchase the 1,100 acres from Allan without renting the 1,100 rented acres. This would reduce Craig's land tenure risk. This may only be a viable option if interest rates are fixed and the term of the loan is long enough to allow the land purchase to cash flow.

- Craig may consider purchasing none of or only portions of Allan's line of machinery. He would then rent or hire machinery as needed without the large capital investment of purchasing Allan's machinery. This would likely be the case if Craig chose to farm only a portion of the 2,200 available acres.
- Craig might consider altering his crop rotation to increase the frequency of higher-profit crops in his rotation. This may not be possible due to disease cycles, machinery requirements, and timeliness of operations, but could increase his profits without adding more acres.
- Increasing his profit margins on each acre that he already farms may give Craig the net income that he wants to achieve. This might be accomplished through increased yields, decreased costs, and improved marketing of his crops.

PROFITABLE MARKETING AT TRIPLE F FARMS

Craig carefully watches the end of his air-drill as he makes the first pass along the edge of the field. A slight move in the wrong direction can be damaging to both the drill and the fence. After several stops to make adjustments, he is confident that the first of the 2006 soybean seed is being placed at the proper depth. He also enjoys that fact that he is getting these soybeans seeded in a timely fashion as it is the 16th of May. He is doing everything he can to give the crop a high yield potential. If he can match the high yield potential with a high price, this soybean crop could be very profitable for Craig.

Enjoying the sunny morning, Craig watches as the acres are rapidly covered. With forty feet of drill, he is able to seed more than twenty acres in an hour. The 200 bushel seed tank means that he only has to stop to fill once every seven hours. On a good day he will cover over 300 acres.

Management of Triple F Farms

Craig uses his farm records from previous years when building his crop budgets and proforma income statement. He also makes adjustments for any changes he expects to occur. Craig usually estimates his projected income tax liability by multiplying the net farm income from operations by an estimated tax rate of 31%. He then uses this information to build a proforma balance sheet for the end of the upcoming year. Craig's proforma income statement for 2006 is given in Table 10, and his proforma balance sheet is given in Table 11. The last line of the proforma income statement shows that Craig is expecting to set aside \$17,099 for retirement in 2006. The net worth of Triple F Farms is projected to be approximately \$910,000 at the end of 2006.

Table 10. Proforma Income Statement, 1/1/2006 Through 12/31/2006

Revenue	Price	Quantity	Unit	Value
Sugar Beets	\$ 35.00	3075	ton	\$ 107,625
Corn	\$ 1.90	64350	bushel	\$ 122,265
Edible Beans	\$ 16.30	6300	hundredweight	\$ 102,690
Soybeans	\$ 5.19	33300	bushel	\$ 172,827
Spring Wheat	\$ 3.40	32500	bushel	\$ 110,500
Government Payments				\$ 39,375
Total Revenue				\$ 655,282
Expenses				
Seed				\$ 67,100
Fertilizer				\$ 47,250
Chemicals				\$ 64,250
Crop Insurance				\$ 22,550
Drying				\$ 9,000
Custom Hire				\$ 4,500
Hired Labor				\$ 32,700
Repairs				\$ 36,500
Land Rent				\$ 161,250
Real Estate Taxes				\$ 1,440
Farm Insurance				\$ 6,000
Utilities				\$ 6,375
Interest				\$ 24,650
Fuel & Oil				\$ 33,250
Depreciation				\$ 14,700
Total Expenses				\$ 531,515
Net Farm Income				
from Operations				\$ 123,767
Change in Deferred Taxes				\$ 4,557
Change in Accrued Income Tax				
Income Taxes Paid				\$ 38,368
Net Income				\$ 80,842
Cash Flows				
Cash Farm Revenue				\$ 655,282
Cash Farm Expense				\$ 516,815
Income Taxes Paid				\$ 38,368
Term Debt Principal Payments				\$ 23,000
Family Living Withdrawals				\$ 60,000
Net Cash Increase (decrease)				\$ 17,099

Table 11. Proforma Balance Sheet

BALANCE SHEET					
Triple F Farms					
12/31/2006					
Current Assets	Cost	Market	Current Liabilities		
Cash	150,000	150,000	Accrued interest on:		
Savings	21,000	21,000	non-current liabilities (schedule 1)		11,000
Bonds & securities	45,099	59,099	Principal due within 12 months on:		
Prepaid Expenses	5,100	5,100	non-current liabilities (schedule 1)		23,000
Supplies	15,000	15,000	Accrued tax liabilities:		
Crop Inventory	227,250	227,250	Income tax		38,368
			Deferred tax on current assets		65,714
Total Current Assets	463,449	477,449	Total Current Liabilities		138,082
Non-Current Assets			Non-Current Liabilities		
Machinery & Buildings			(Principal due beyond 12 months)		
Cost or basis	505,612		Notes (schedule 1)		94,400
Accumulated depreciation	459,112		Real Estate Mortgages (schedule 1)		38,600
Value	46,500	535,612	Deferred tax on non-current assets		191,615
Investment in cooperatives	151,000	226,000	Total Non-Current Liabilities		324,615
Real Estate	81,000	135,000	Total Liabilities		
			Owner Equity:		Cost
			Retained Earnings		279,252
			Valuation Equity		632,112
Total Non-Current Assets	278,500	896,612	Total Owner Equity		279,252
			Total Liabilities		911,364
Total Assets	741,949	1,374,061	and Owner Equity		741,949
					1,374,061

The Marketing Problem

While Craig is happy to be getting the soybeans seeded in such good conditions he is concerned about the profit potential of the crop he is planting. In 2005 he had chances to sell new crop soybeans at profitable levels, as high as \$6.32 per bushel. He passed up the opportunity, believing that prices would go higher. When prices declined into harvest, he stored 20,000 bushels of soybeans on the farm with the hope that prices would rise. Prices continued to decline. He sold the soybeans for \$4.96 per bushel this spring, as he feared prices would continue to decline. If he had signed a cash contract for 20,000 bushels of his soybeans for \$6.32 instead of \$4.96, he would have been very close to reaching his goal of \$110,000 net income.

This is not the first time this has happened. When Craig thinks back to prior years, he realizes that he has a history of similar marketing experiences. He usually delivers and sells just enough grain at harvest so that the rest of the crop will fit in his bins. He then holds on to the grain through the winter in anticipation of higher prices in the spring. Craig knows that prices are usually higher in the spring, especially late spring. The problem is, he usually waits too long to sell the grain because he is busy planting the next crop. He is then forced to sell the grain just before the next harvest in order to make room for the next crop. He usually ends up with the harvest price for grain he sells off the combine and the next year's harvest price for the grain that he stores, less the storage costs that he incurs.

As the owner of Triple F Farms, Craig spends a good portion of his time planning the future of his operation. He has been wondering what he could do to achieve his goals and address his concerns. Several years ago he chose to name his farm "Triple F Farms"; the three F's signifying his motto, which is "Farming for the Future." He knows that he needs to improve his marketing if his farm is going to continue to be profitable into the future.

When he is not busy planting his crops, Craig likes to talk to his neighbors over breakfast at the local café. The most recent discussions have revolved around rumors that the prices for fuel and fertilizer might increase by 25 to 50% within five years. Craig is wondering what actions may be necessary in the face of such uncertainty. He is also worried about the risk of grain prices going lower before he sells, or going higher after he sells. He is concerned about being able to maintain his profitability, and even more concerned about his ability to increase it to meet his goals.

Some of Craig's neighbors and friends belong to a local marketing club. Craig decided he should talk to the marketing club adviser, Richard, about joining the club. While talking to Richard, Craig explained to him the story of his 2005 crop soybean marketing. Richard said, "Ah yes, the infamous '*greed, hope, and fear*' marketing." "What do you mean?" Craig asked. Richard responded, "You didn't sell the grain initially because you were *greedy* and wanted a higher price. As the price started to decline you held the grain because you *hoped* it would turn around and go higher. As the price dropped further, you sold the grain near the bottom of the market out of *fear* of lower prices. It was a result of a lack of discipline in your marketing strategies." Craig realized then that that was exactly what had happened. He decided that he needs more discipline for his marketing strategies in order to increase his profitability and better manage his risk.

The Marketing Plans

While Craig was talking with Richard he was told that he needs to develop a written marketing plan. When Craig asked what that means, Richard described to him how it is constructed and what the results could mean for his farm. Richard suggested that a written marketing plan, if followed, should be able to raise the average price received for the crops on Craig's farm. He said it should also be able to reduce the probability of receiving unprofitable prices for his crops. He told Craig that he should seek advice from the state's land grant university. Richard said that on his own farm he uses a marketing plan that uses a combination of seasonal trends and trigger prices to make marketing decisions based on cash prices. He has been very happy with it most years and feels that it gives him an excellent average price. Following a marketing plan has helped Richard lower the chance of pricing grain at the low point of the year. Richard gave Craig a blank copy of the

marketing plan that he uses on his farm. It is shown in Table 12. Richard said that he usually sets a modest price goal for the first lot of grain and then increases his price target for subsequent sales.

Table 12. Example Marketing Plan

Corn	marketing plan for year	2006	
Price _____	bushels at \$ _____	_____	cash price per bushel, or by _____
Price _____	bushels at \$ _____	_____	cash price per bushel, or by _____
Price _____	bushels at \$ _____	_____	cash price per bushel, or by _____
Price _____	bushels at \$ _____	_____	cash price per bushel, or by _____
Price _____	bushels at \$ _____	_____	cash price per bushel, or by _____

Earlier sales will be made at a \$ _____ premium to the price targets noted above.
 Ignore decision dates and make no sale if prices are lower than \$ _____ cash price.
 Any unpriced grain in storage will be sold by _____

Richard also told Craig that he needs to take his storage capacities and storage costs into account when building a marketing plan. Craig has 75,000 bushels of storage on the farm that can be used for corn, wheat, and/or soybeans. Craig estimates that he incurs a storage cost of \$0.03 per bushel per month when he stores grain at his farm. If he chooses to store grain at the elevator, the cost is also \$0.03 per bushel per month. He usually prefers to store grain at the farm because it allows for a faster harvest. There is usually a line of trucks waiting to unload at the elevator during harvest, and his own storage bins are closer to his fields.

Craig often seeks management advice from his closest neighbor, Jeremy. Jeremy has recently graduated from college with training in farm management. While discussing the potential cost increases for fuel and fertilizer, Jeremy suggested that Craig needs a sensitivity analysis included in his proforma analysis. He said that when profit margins are squeezed by increasing energy prices a sensitivity analysis will be able to show if a

disciplined marketing plan will partially offset the cost increases. Jeremy described to him how a simple sensitivity analysis is performed and what the results will mean for his farm. Craig has decided that a sensitivity analysis will be necessary in order to determine the potential effects of cost increases of 25% to 50% for fuel and fertilizer on his farm and how a disciplined marketing plan may affect the results.

A Call to Action

When the air drill runs empty of seed, Craig heads across the field in the direction of the truck. Filling the drill takes half an hour and then he is back to seeding. By the end of the day he will seed over 300 acres. With about 600 acres of soybeans and 450 of pinto beans left to seed, four more days of dry weather are needed to get the rest of the crop in the ground. While finishing this task, he will be thinking about his marketing strategies.

Craig knows he needs help constructing a marketing plan. He needs to know what his net income might be if his marketing plan is successful. He also wants to know what effect the potential increases in fuel and fertilizer costs might have on his net farm income from operations and if the use of a marketing plan will help in that area of concern. He realized losses when he sold the remainder of his 2005 crop, and he is not ready to accept such an outcome for the 2006 crop. He wants to develop a disciplined marketing plan before the end of May so that he can be ready to capture any profitable marketing opportunities.

INSTRUCTOR NOTES FOR PROFITABLE MARKETING

The focus of this case study is developing profitable marketing strategies for a farm family. The challenge facing Triple F Farms is the development of a disciplined marketing plan. The purpose of the case study is to demonstrate the use of a disciplined marketing plan to enhance farm profitability. It is also meant to give the reader practice in analyzing the marketing abilities of a producer and developing marketing plans that fit specific producer goals. The students will also be asked to evaluate the potential results of the marketing plan. The producer in the case has set a financial goal, and the students will be asked to determine the best plan to help the producer achieve the goal. Most of the analysis by the students will be quantitative along with some qualitative analysis of the decision maker.

Specific tasks for the students may include the following questions and answers:

1. How would you describe Craig's history of commodity marketing? What have been his strategies?
 - Craig has a history of "greed, hope, and fear" marketing. He has never sold grain pre-harvest because he has always had hopes of higher prices. He then stores as much grain as his bins will hold. He stores the grain for too long due to his greed for higher prices and hope of higher prices. He is then forced to sell the grain just before the next year's harvest to make room for the next crop and/or sells from fear of lower prices.
 - Craig has not had a formal strategy to guide his marketing. Any attempt at disciplined marketing has been dominated by greed, hope, and fear.

2. Develop a disciplined marketing plan for Craig's annual production of corn, soybeans, pinto beans, and wheat without using the format provided by Richard. Use the historical cash price data in Table 13 as a guide when preparing the marketing plan. The 'Average' is the average price for that month over the period in the table. Craig's objectives would be to market grain in the months with the higher average prices. Take into consideration Craig's grain storage capacities and storage costs for the corn, soybeans, and wheat. Is the plan simple to follow? If the plan had been in place for the years 1993-2004, would the average prices be higher than the harvest prices, taking storage costs into account? If so, by how much?
- A potential plan is shown in Table 14. It is simple to follow and gives Craig the disciplined structure that he needs.
 - The plan was constructed so that almost half of Craig's crops will be priced pre-harvest using cash contracts in the months with the highest historical averages. Additional quantities will be stored on the farm to be sold in later months that have high average prices. Craig will use 70,000 bushels of his grain storage capacity each year. The remainder of the crops will be sold at harvest which provides some flexibility for yield variations and storage capacities.
 - Almost all of the crop will be sold in months that historically have the highest average prices.
 - The use of the marketing plan over the years 1993-2004 increases Craig's average corn price by \$0.22, soybeans by \$0.46, pinto beans by \$0.46, and wheat by \$0.13 compared to receiving the harvest price. The harvest prices are

the August price for wheat, September for edible beans, and October for soybeans and corn.

Table 13. Historical Price Data

Monthly average cash price per bushel for #2 yellow corn (1993-2006)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1993	1.83	1.82	1.87	1.96	1.97	1.85	2.08	2.07	2.06	2.16	2.42	2.35
1994	2.67	2.56	2.50	2.47	2.51	2.42	1.99	1.97	1.88	1.82	1.73	1.88
1995	1.95	2.01	2.09	2.19	2.30	2.43	2.53	2.44	2.61	2.79	2.86	3.03
1996	3.17	3.35	3.51	4.05	4.47	4.35	4.34	4.09	2.87	2.39	2.25	2.26
1997	2.28	2.34	2.50	2.48	2.35	2.24	2.11	2.19	2.12	2.27	2.23	2.09
1998	2.08	2.10	2.11	2.02	1.99	2.01	1.85	1.59	1.45	1.48	1.49	1.59
1999	1.60	1.63	1.68	1.66	1.74	1.73	1.49	1.47	1.39	1.32	1.34	1.42
2000	1.58	1.60	1.68	1.67	1.84	1.59	1.35	1.29	1.32	1.43	1.47	1.61
2001	1.55	1.50	1.54	1.53	1.51	1.53	1.68	1.63	1.62	1.56	1.59	1.80
2002	1.75	1.73	1.74	1.76	1.81	1.90	2.10	2.30	2.30	2.12	2.07	2.01
2003	2.06	2.13	2.09	2.16	2.21	2.15	1.93	1.97	1.93	1.83	2.04	2.13
2004	2.31	2.57	2.78	2.90	2.77	2.66	2.19	2.12	2.04	1.59	1.54	1.58
2005	1.59	1.63	1.73	1.67	1.67	1.75	1.78	1.59	1.49	1.45	1.41	1.55
2006	1.63	1.67	1.64									
Average	2.00	2.05	2.10	2.19	2.24	2.20	2.11	2.06	1.93	1.86	1.88	1.95

Monthly average cash price per bushel for soybeans (1993-2006)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1993	5.35	5.32	5.42	5.46	5.56	5.56	6.55	6.19	6.16	5.71	6.17	6.40
1994	6.49	6.59	6.38	6.18	6.35	6.26	5.52	5.21	5.13	4.93	5.02	5.08
1995	5.01	5.04	5.20	5.23	5.28	5.39	5.68	5.39	5.74	5.99	6.20	6.61
1996	6.77	6.77	6.73	7.28	7.51	7.22	7.38	7.54	7.32	6.51	6.38	6.55
1997	6.86	7.10	7.77	7.95	8.15	7.76	7.05	6.50	5.92	6.24	6.58	6.26
1998	6.04	6.09	5.90	5.76	5.83	5.70	5.60	4.67	4.57	4.74	4.96	4.83
1999	4.63	4.24	4.10	3.48	4.04	3.98	3.70	4.07	4.23	4.05	3.86	3.73
2000	4.32	4.35	4.55	4.68	4.83	4.52	4.08	4.06	4.23	3.96	4.07	4.47
2001	4.27	4.09	4.01	3.83	3.95	4.16	4.54	4.34	4.10	3.74	3.84	3.87
2002	3.84	3.80	3.96	4.05	4.25	4.50	5.12	5.12	5.17	4.95	5.25	5.23
2003	5.28	5.31	5.31	5.61	5.85	5.79	5.33	5.20	5.78	6.82	7.23	7.22
2004	7.70	8.21	9.33	9.36	8.98	7.84	7.27	5.41	5.07	4.65	4.91	5.12
2005	5.01	5.10	5.84	5.79	5.87	6.32	6.17	5.53	5.15	5.10	5.12	5.29
2006	5.20	5.07	4.96									
Average	5.48	5.51	5.67	5.74	5.88	5.77	5.69	5.33	5.27	5.18	5.35	5.43

Table 13. (continued)

Monthly average cash price per hundredweight for pinto beans (1999-2006)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1999	13.9	12.1	11.4	11.2	11.9	12.7	14.0	13.6	14.7	13.7	12.1	12.2
2000	12.5	11.1	11.0	10.9	10.9	11.3	12.1	12.3	13.4	12.9	12.2	11.8
2001	11.2	10.4	11.3	11.5	12.3	13.9	14.0	14.4	16.0	16.4	20.1	19.4
2002	19.6	28.8	30.4	30.7	29.9	30.0	28.4	25.4	16.2	15.0	15.0	13.9
2003	13.9	12.6	12.3	13.3	13.7	14.3	14.6	14.6	14.9	14.3	14.8	14.7
2004	15.2	15.6	16.3	17.4	18.1	17.7	17.5	17.4	22.6	25.0	28.5	27.7
2005	26.7	30.3	28.2	26.3	23.9	23.3	21.4	21.6	15.4	15.6	14.6	14.3
2006	15.8	13.5	14.1									
Average	16.1	16.8	16.9	17.3	17.2	17.6	17.4	17.0	16.2	16.1	16.8	16.3

Monthly average cash price per bushel for spring wheat (1993-2006)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1993	3.44	3.34	3.37	3.36	3.20	3.36	3.83	3.65	4.03	4.31	4.50	4.44
1994	4.31	4.24	4.01	3.99	4.18	3.60	3.45	3.36	3.69	3.79	3.61	3.69
1995	3.54	3.44	3.41	3.56	3.93	4.32	4.92	4.28	4.47	4.88	4.91	5.03
1996	4.87	4.99	4.97	5.63	6.24	5.83	5.05	4.51	3.79	3.87	3.80	3.59
1997	3.84	3.72	3.93	4.03	3.83	3.65	3.58	3.77	3.69	3.58	3.52	3.51
1998	3.37	3.43	3.47	3.37	3.36	3.23	3.09	2.86	2.82	3.14	3.25	3.22
1999	3.16	2.99	3.00	2.86	2.85	3.02	2.87	2.81	2.79	2.78	2.86	2.85
2000	2.90	2.85	2.91	2.94	2.98	2.95	2.73	2.55	2.60	2.81	2.91	3.01
2001	3.06	2.94	2.93	3.00	3.09	3.01	2.99	2.76	2.80	2.89	3.00	2.93
2002	2.90	2.84	2.85	2.88	2.86	2.94	3.33	3.71	4.60	4.59	4.19	3.76
2003	3.62	3.72	3.61	3.38	3.44	3.36	3.21	3.43	3.18	3.37	3.66	3.59
2004	3.65	3.81	3.90	3.83	3.82	3.74	3.43	3.12	3.42	3.34	3.51	3.48
2005	3.65	3.53	3.63	3.26	3.42	3.64	3.34	3.29	3.49	3.65	3.58	3.65
2006	3.68	3.81	3.77									
Average	3.57	3.55	3.55	3.55	3.63	3.59	3.53	3.39	3.49	3.61	3.64	3.60

Sources: Flaskerud (2006), Minneapolis Grain Exchange (2006), and USDA Economic Research Service (2006).

3. What are some key problems with the marketing plan? What could be improved upon to make the marketing plan better?

- The marketing plan is based solely on past seasonal trends. Future years may not follow the same trends. The plan does enhance Craig's income on average,

but does little to reduce the probability of selling at the lowest price of the year on any particular year.

- The marketing plan tells Craig to market a certain number of bushels in a particular month, but does not set minimum price levels or target prices.
- The marketing plan should include some minimum price levels. If, for example, corn is below the price minimum in May, Craig should not price the 10,000 bushels of new crop corn.
- The marketing plan should include flexibility to allow Craig to price grain in other months if the price is at or above a certain target price.

Table 14. Marketing Plan #1 (bushels or hundredweight priced per month)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Corn													
Pre-harvest				10000	10000	10000							30000
Harvest										4350			4350
Post-harvest				10000	10000	10000							30000
Total													64350
Soybeans													
Pre-harvest				5000	5000	5000							15000
Harvest										3300			3300
Post-harvest				5000	5000	5000							15000
Total													33300
Pinto Beans													
Pre-harvest				1000		1000	1000						3000
Harvest										1800			1800
Post-harvest				500		500	500						1500
Total													6300
Wheat													
Pre-harvest					5000								5000
Harvest								2500					2500
Post-harvest											15000	10000	25000
Total													32500

- The marketing plan does not provide Craig with enough discipline for timing his pricing decisions within each month. Target prices need to be included so that Craig will price grain when the target is reached, otherwise he will wait until the last day of the month due to his greed, hope, and fear.
4. Develop a disciplined marketing plan for Craig's annual production of corn, soybeans, pinto beans, and wheat using the format provided by Richard. Also use the historical cash price data in Table 13 as a guide when preparing the marketing plan. Take into consideration Craig's grain storage capacities and storage costs. Craig would like to begin pricing his crops at prices of \$2.05, \$5.50, \$3.65, and \$16.00 for corn, soybeans, wheat, and pinto beans, respectively. Subsequent sales will then have higher price targets. If the plan had been in place for the years 1993-2004, would the average prices be higher than the harvest prices, taking storage costs into account? If so, by how much?
- A potential plan is shown in Table 15. It is simple to follow and gives Craig the disciplined structure that he needs.
 - The plan was constructed with similar quantities and time periods as the previous plan; however, price targets and price minimums have been included.
 - Each lot of grain in the plan has a price target and decision date associated with it. If the price target is reached within the month, the grain will be priced. If the target is not reached, the grain will be priced on or by the decision date.
 - If the price is below the price minimum, the decision date will be ignored.

Table 15. Marketing Plan #2

Corn	marketing plan for year	2006		
Price	15,000 bushels at \$	2.05	cash price per bushel, or by	4/30/2006
Price	15,000 bushels at \$	2.15	cash price per bushel, or by	5/30/2006
Price	15,000 bushels at \$	2.25	cash price per bushel, or by	6/30/2006
Price	4,350 bushels at \$	2.35	cash price per bushel, or by	10/30/2006
Price	15,000 bushels at \$	2.45	cash price per bushel, or by	4/30/2007

Earlier sales will be made at a \$ 0.20 premium to the price targets noted above.

Ignore decision dates and make no sale if prices are lower than

\$ 1.80 cash price.

Any unpriced grain in storage will be sold by July 30, 2007.

Soybean	marketing plan for year	2006		
Price	5,000 bushels at \$	5.50	cash price per bushel, or by	4/30/2006
Price	5,000 bushels at \$	5.70	cash price per bushel, or by	5/30/2006
Price	10,000 bushels at \$	5.90	cash price per bushel, or by	6/30/2006
Price	3,300 bushels at \$	6.10	cash price per bushel, or by	10/30/2006
Price	10,000 bushels at \$	6.30	cash price per bushel, or by	4/30/2007

Earlier sales will be made at a \$ 0.20 premium to the price targets noted above.

Ignore decision dates and make no sale if prices are lower than

\$ 4.80 cash price.

Any unpriced grain in storage will be sold by July 30, 2007.

Wheat	marketing plan for year	2006		
Price	10,000 bushels at \$	3.65	cash price per bushel, or by	5/30/2006
Price	2,500 bushels at \$	3.75	cash price per bushel, or by	8/30/2006
Price	10,000 bushels at \$	3.85	cash price per bushel, or by	11/30/2006
Price	10,000 bushels at \$	3.95	cash price per bushel, or by	1/30/2007

Earlier sales will be made at a \$ 0.20 premium to the price targets noted above.

Ignore decision dates and make no sale if prices are lower than

\$ 2.80 cash price.

Any unpriced grain in storage will be sold by July 30, 2007.

Pinto bean	marketing plan for year	2006		
Price	1,500 cwt. at \$	16.00	cash price per hundredweight, or by	4/30/2006
Price	1,500 cwt. at \$	17.00	cash price per hundredweight, or by	6/30/2006
Price	1,800 cwt. at \$	18.00	cash price per hundredweight, or by	9/30/2006
Price	1,500 cwt. at \$	19.00	cash price per hundredweight, or by	6/30/2006

Earlier sales will be made at a \$ 4.00 premium to the price targets noted above.

Ignore decision dates and make no sale if prices are lower than

\$ 12.00 cash price.

Any unpriced grain in storage will be sold by July 30, 2007.

- Each lot of grain to be sold can be priced before the month in which it is scheduled to be sold if it is priced at a certain premium to the target price. The

exception to this is that no more than 70% of his actual production history can be priced pre-harvest.

- No grain will be stored after July 30th of the year following the harvest of that crop.
- The use of the marketing plan over the years 1993-2004 increases Craig's average corn price by \$0.16, soybeans by \$0.40, pinto beans by \$1.03, and wheat by \$0.16 compared to the harvest prices.

5. Set up a table to measure the performance of both marketing plans over the years 1993-2004 in comparison to receiving the harvest prices, using the data in Table 13. Evaluate the marketing plans for all four crops and the three alternative "plans" based on several factors: What is the average price received? What is the standard deviation of prices? How often does each plan result in a price that is lower than the minimum prices set forth in plan #2? How often does each plan result in a price that is higher than the other two plans? How often is it the lowest? Which plan would you recommend to Craig for each crop?

- A summary of the three alternatives is shown in Table 16.
- For corn, consider Plan #1. The standard deviation is higher, but it gives the highest average price and the lowest number of lows. It results in a moderate number of highs and the frequency of prices below the minimum of \$1.80 is equivalent to the other two options.
- For soybeans, consider Plan #2. The average price is slightly lower than Plan #1, but the standard deviation is lower, it results in more highs, and has fewer prices below the minimum of \$4.80. It only results in one more low.

Table 16. Marketing Plan Performance (price per bushel or hundredweight)

Corn	No Plan	Plan 1	Plan 2	Wheat	No Plan	Plan 1	Plan 2
1993	2.16	2.10	2.09	1993	3.65	4.14	3.88
1994	1.82	2.25	2.46	1994	3.36	3.62	3.71
1995	2.79	3.17	2.45	1995	4.28	4.67	4.17
1996	2.39	3.16	2.91	1996	4.51	4.09	4.62
1997	2.27	2.09	2.28	1997	3.77	3.51	3.55
1998	1.48	1.73	1.77	1998	2.86	3.15	3.15
1999	1.32	1.58	1.08	1999	2.81	2.77	2.79
2000	1.43	1.50	1.51	2000	2.55	2.85	2.89
2001	1.56	1.57	1.83	2001	2.76	2.90	2.93
2002	2.12	1.91	1.86	2002	3.71	3.74	3.98
2003	1.83	2.33	2.26	2003	3.43	3.51	3.50
2004	1.59	2.10	2.19	2004	3.12	3.44	3.57
Average	1.90	2.12	2.06	Average	3.40	3.53	3.56
Std. Dev.	0.45	0.56	0.48	Std. Dev.	0.62	0.57	0.56
# < 1.80	5	4	4	# < 2.80	2	1	1
# Highs	2	4	6	# Highs	2	3	6
# Lows	7	1	4	# Lows	8	3	1
Soybean	No Plan	Plan 1	Plan 2	Pinto bean	No Plan	Plan 1	Plan 2
1993	5.71	5.78	5.83	1999	14.70	12.94	13.60
1994	4.93	5.60	5.90	2000	13.40	12.40	14.21
1995	5.99	6.19	5.76	2001	16.00	18.01	18.55
1996	6.51	7.44	6.67	2002	16.20	21.78	21.82
1997	6.24	6.70	6.71	2003	14.90	14.96	15.00
1998	4.74	4.70	4.86	2004	22.60	20.44	20.77
1999	4.05	4.14	3.88	Average	16.30	16.76	17.33
2000	3.96	4.20	4.35	Std. Dev.	3.25	3.93	3.54
2001	3.74	3.99	4.85	# < 12.00	0	0	0
2002	4.95	4.91	5.16	# Highs	1	0	5
2003	6.82	7.10	6.18	# Lows	3	3	0
2004	4.65	7.00	6.89				
Average	5.19	5.65	5.59				
Std. Dev.	1.04	1.25	0.97				
# < 4.80	5	4	2				
# Highs	0	5	7				
# Lows	7	2	3				

- For wheat, consider Plan #2. It results in the highest average price, the lowest standard deviation, the highest number of highs, and the lowest number of lows.

- For pinto beans, consider Plan #2. It gives the highest average price and a moderate standard deviation. It gives the highest price in five out of six years and results in zero lows.

6. Implement the average prices from the chosen marketing plans into a new proforma income statement. What is the projected net income? How much money will be available for retirement and college savings? What is the projected net worth on 12/31/2006? Do the marketing plans put Triple F Farms on a path to helping Craig achieve his income goal? What do the results of a sensitivity analysis regarding the impact of fuel and fertilizer costs on his net farm income from operations indicate about the effects of his marketing plan?

- The proforma income statement is shown in Table 17. The projected net income is \$111,631. There is projected to be \$56,265 available for college savings and retirement savings at the end of 2006. Table 18 shows that the net worth on 12/31/2006 is projected to be \$310,040. This is more than \$30,000 higher than the projection without a marketing plan.
- The use of the marketing plan gets Craig over his net income goal of \$110,000. Craig and Cathy will be able to surpass their goal of saving \$20,000 per year for their children's college expenses and an additional \$10,000 per year for retirement.
- The marketing plan allows Craig to increase his net farm income without increasing his debt load or incurring any new capital expenses.

Table 17. Proforma Income Statement with Marketing Plans, 1/1/06 Through 12/31/06

Revenue	Price	Quantity	Unit	Value
Sugar Beets	\$35.00	3075	ton	\$107,625
Corn	\$ 2.12	64350	bushel	\$136,422
Edible Beans	\$17.33	6300	hundredweight	\$109,179
Soybeans	\$ 5.59	33300	bushel	\$186,147
Spring Wheat	\$ 3.56	32500	bushel	\$115,700
Government Payments				\$ 39,375
Total Revenue				\$694,448
Expenses				
Seed				\$ 67,100
Fertilizer				\$ 47,250
Chemicals				\$ 64,250
Crop Insurance				\$ 22,550
Drying				\$ 9,000
Custom Hire				\$ 4,500
Hired Labor				\$ 32,700
Repairs				\$ 36,500
Land Rent				\$161,250
Real Estate Taxes				\$ 1,440
Farm Insurance				\$ 6,000
Utilities				\$ 6,375
Interest				\$ 24,650
Fuel & Oil				\$ 33,250
Depreciation				\$ 14,700
Total Expenses				\$531,515
Net Farm Income				
from Operations				\$162,933
Change in Deferred Taxes				\$ 793
Change in Accrued Income Tax				\$ 12,141
Income Taxes Paid				\$ 38,368
Net Income				\$111,631
Cash Flows				
Cash Farm Revenue				\$694,448
Cash Farm Expense				\$516,815
Income Taxes Paid				\$ 38,368
Term Debt Principal Payments				\$ 23,000
Family Living Withdrawals				\$ 60,000
Net Cash Increase (decrease)				\$ 56,265

Table 18. Proforma Balance Sheet with Marketing Plans

BALANCE SHEET					
Triple F Farms					
12/31/2006					
Current Assets	Cost	Market	Current Liabilities		
Cash	150,000	150,000	Accrued interest on:		
Savings	21,000	21,000	non-current liabilities (schedule 1)	11,000	
Bonds & securities	84,265	98,265	Principal due within 12 months on:		
Prepaid Expenses	5,100	5,100	non-current liabilities (schedule 1)	23,000	
Supplies	15,000	15,000	Accrued tax liabilities:		
Crop Inventory	227,250	227,250	Income tax	50,509	
			Deferred tax on current assets	61,951	
Total Current Assets	502,615	516,615	Total Current Liabilities	146,460	
Non-Current Assets			Non-Current Liabilities		
Machinery & Buildings			(Principal due beyond 12 months)		
Cost or basis	505,612		Notes (schedule 1)	94,400	
Accumulated depreciation	459,112		Real Estate Mortgages (schedule 1)	38,600	
Value	46,500	535,612	Deferred tax on non-current assets	191,615	
Investment in cooperatives	151,000	226,000	Total Non-Current Liabilities	324,615	
Real Estate	81,000	135,000	Total Liabilities	471,075	
			Owner Equity:	Cost	Market
			Retained Earnings	310,040	310,040
Total Non-Current Assets	278,500	896,612	Valuation Equity		632,112
			Total Owner Equity	310,040	942,152
			Total Liabilities		
Total Assets	781,115	1,413,227	and Owner Equity	781,115	1,413,227

- The sensitivity analysis shows that Craig's net farm income from operations will be less sensitive to increased fuel and fertilizer costs if he has a successful marketing plan. This is because the use of a disciplined marketing plan will increase Craig's profit margins, on average, which reduces the impact of increases in fuel and fertilizer costs on his profitability. The results of the sensitivity analysis are shown in Table 19.
- In summary, the marketing plan would increase the net farm income of Triple F Farms while at the same time reducing risk from fuel and fertilizer cost increases.

Table 19. Sensitivity Analysis with Marketing Plans

Net Farm Income from Operations as a result of:	Without Marketing Plan	With Marketing Plan
A 25% increase in fuel and fertilizer costs	\$103,642	\$142,808
Change	\$(20,125)	\$(20,125)
Percent change	-16%	-12%
A 50% increase in fuel and fertilizer costs	\$83,517	\$122,683
Change	\$(40,250)	\$(40,250)
Percent change	-33%	-25%

7. The marketing plans developed here all used cash contracts and cash sales for the pricing activities. Is this an appropriate strategy for Craig? What recommendations could you give to Craig to help him improve his marketing into the future?

- The use of cash contracts and cash sales is appropriate for Craig at this time, since he has little experience with marketing plans and pre-harvest sales.
- In the future, Craig should begin to pay attention to futures prices and basis levels separately so that he can optimize both of them. He may want to lock in only the futures price level if the basis is weak, or vice-versa if the basis is strong and the futures price is low.
- If he acquires experience in the futures market he may want to consider the use of options to protect himself from downward price movement while exposing himself to unlimited upside potential. Options can be too expensive in some situations, but in others can provide a form of insurance against low prices.
- He should join the local marketing club that Richard belongs to so that he can acquire experience and learn from his peers.

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