

Name: _____

Chapter: _____



2011

North Carolina FFA Farm Business Management
Career Development Event

Section II: Problem Solving (200 points)

Read each problem carefully. The main concept of each problem is stated at the start of each problem. Read the entire problem before beginning work on that problem.

Section II contains six (6) problems. Check to see that you have 21 pages including the cover page. The point value for each of your answers is stated in parenthesis to the right of each blank or in the question text. You have 100 minutes to complete this section of the Career Development Event.

prepared by
Melanie Smith Ball
CDE Volunteer, NC FFA Association
smith.melanie@gmail.com
919-491-1343

in cooperation with
Department of Agricultural and Extension Education
College of Agriculture and Life Sciences
North Carolina State University

sponsored by

Southern States Cooperative, Inc.

Contents

Table 1. Statements of Net Worth	4
Table 2. Income Statements	5
Table 3. Melons - Cantaloupe & Honeydew	6
Table 4. Strawberries, owned, harvest and market	7
Part 1 – Analysis of Cash Flow.....	8
Part 2a – Analysis of Balance Sheets	10
Part 2b – Analysis of Income Statements	12
Part 3 – Enterprise & Risk Management	13
Part 4 – Partial Budgeting	16
Part 5 – Income Tax Management	17
Part 6 - Capital Investment Analysis.....	19

2011 NC FFA Farm Business Management

Resource Information

Table 1. Statements of Net Worth

Resource Information for the Harding farm business, As of 12/31/2009 and 12/31/2010
2011 NC FFA Farm Business Management Career Development Event

	<u>12/31/09</u>	<u>12/31/10</u>
Assets		
<u>Current Assets</u>		
Cash in Farm Account	\$18,750	\$22,900
Farm Accounts Receivable	0	0
Stored Crops	0	0
Growing Crops	150,000	180,000
Other Current Assets	0	0
Total Current Assets	168,750	202,900
<u>Non Current Assets</u>		
Machinery & Buildings	402,603	398,245
Land (253 Acres)	1,617,176	1,720,400
Total Non-Current Assets	2,019,779	2,118,645
Total Farm Assets	\$2,188,529	\$2,321,545
Liabilities		
<u>Current Liabilities</u>		
Short Term Notes Payable	\$85,694	\$32,654
Accounts Payable	48,250	27,682
Portion of Machinery and Equipment Debt Due	30,000	29,500
Portion of Land Debt Due	56,000	54,000
Accrued Liabilities (taxes, rent)	5,000	2,000
Accrued Interest	3,375	0
Total Current Liabilities	228,319	145,836
<u>Non-Current Liabilities</u>		
Non-Current Liabilities Due after one year	61,302	57,932
Land Payment Due after One Year	1,300,000	1,295,000
Total Non-Current Liabilities	\$1,361,302	\$1,352,932
Total Farm Liabilities	\$1,589,621	\$1,498,768
Net Worth (Equity)	\$598,908	\$822,777

Table 2. Income Statements

Resource Information for the Harding farm business
2011 NC FFA Farm Business Management Career Development Event

	2009	2010
Revenue		
Beef	\$161,028	\$167,832
Tomatoes	183,713	209,588
Melons	60,750	63,788
Strawberries	729,300	772,200
Patronage Dividend	6,123	5,875
Farm Service Agency Payments	526	345
Miscellaneous Farm Income	4,985	7,142
Total Revenue	\$1,146,425	\$1,226,769
Expenses		
Cash Operating Expenses		
Chemicals	\$169,725	\$156,890
Feed	30,346	25,098
Fertilizer & Lime	45,407	43,745
Freight/Trucking	16,700	18,000
Gas, Fuel, Oil	12,059	12,454
Insurance	22,318	33,757
Crop Insurance	9,083	9,026
Labor Hired and Payroll Taxes	417,132	423,610
Machine Hire	3,004	2,907
Cash Rent	64,343	110,873
Repairs-Mach	58,364	53,698
Repairs-Bldg	18,500	2,514
Seeds/Plants	39,232	33,498
Storage	6,426	7,345
Supplies	513	1,984
Taxes	89,830	105,779
Utilities-Farm Share	5,404	7,151
Miscellaneous Farm Expenses	9,591	8,952
Total Cash Operating Expenses	\$1,017,977	\$1,057,281
Inventory Adjustments		
Accounts Payable	32,568	-17,500
Change in Accrued Taxes	5,000	1,200
Other Accrued Expenses	5,000	1,500
Depreciation	22,780	17,600
Total Operating Expenses	\$1,083,325	\$1,060,081
Cash Interest Paid	61,863	60,515
Change in Interest Payable	0	0
Total Interest Expense	\$61,863	\$60,515
Total Expenses	\$1,145,188	\$1,120,596
Net Farm Income From Operations	\$31,983	\$106,174

Table 3. Melons - Cantaloupe & Honeydew

Resource Information for the Harding farm business, 31-Jan-10
2011 NC FFA Farm Business Management Career Development Event

OPERATING INPUTS	UNITS	PRICE	QUANTITY	VALUE
Seed	1000 Seeds/Acre	30.450	4	121.80
Nitrogen	Cwt	38.250	2.043	78.14
Phosphorus	Cwt	27.440	0.43	11.80
Potassium	Cwt	10.240	4.582	46.92
Boron	Lbs	0.300	1.5	0.45
Herbicide	Per Acre	10.070	1	10.07
Fumigation, Plastic	Per Acre	956.000	1	956.00
Bee Hive Rental	Per Each	35.000	1	35.00
Custom Harvest/Sort	Per Each	0.080	5500	440.00
Interest on Operating Capital	Dollars	6.000%	1,307.000	78.42
Insecticide	Per Acre	2.610	1.000	2.61
Fungicide	Per Acre	7.490	4.000	29.96
40 pound carton	Per Each	1.250	450.000	562.50
Plastic Disposal	Per Acre	100.000	1.000	100.00
Labor	Hours	8.000	29.000	232.00
Machinery Fuel, Lube, Repairs	Per Acre	23.070	1.000	23.07
TOTAL OPERATING COSTS				2,728.74
FIXED COSTS		AMOUNT		VALUE
Machinery				
Interest at 7.150%		1.00		30.53
Depr, Taxes, Insurance		0.00		0.00
Irrigation				
Interest at 7.150%		0.00		30.53
Depr, Taxes, Insurance		0.00		0.00
Equipment				
Interest at 7.150%		0.00		30.53
Depr, Taxes, Insurance		0.00		0.00
Land				
Interest at 7.150%		0.00		30.53
Taxes		0.00		0.00
TOTAL FIXED COSTS				122.12
PRODUCTION	UNITS	PRICE	QUANTITY	VALUE
Cantaloupe & Honeydew	Per Each	0.75	5,500.00	4,125.00
TOTAL RECEIPTS				4,125.00
TOTAL RECEIPTS				4,125.00
TOTAL OPERATING COSTS				2,728.74
RETURNS ABOVE TOTAL OPERATING COSTS				1,396.26
TOTAL FIXED COSTS				122.12
RETURNS ABOVE ALL SPECIFIED COSTS				1,274.14

Table 4. Strawberries, owned, harvest and market

Resource Information for the Harding farm business, 31-Jan-10
2010 NC FFA Farm Business Management Career Development Event

OPERATING INPUTS	UNITS	PRICE	QUANTITY	VALUE
Plants	1000 Seeds/Acre	84.000	15	1,260.00
Preplant Fertilizer	Cwt	13.000	6	78.00
Postplant Fertilizer	Cwt	20.600	4	82.40
Lime	Tons	27.000	1	27.00
Herbicide	Gallon	59.200	0.5	29.60
Transplant Costs	1000 Seeds/Acre	38.000	15	570.00
Annual Operating Capital	Dollars	6.000%	5,706.000	342.36
Ryegrass	Pounds	0.340	15	5.10
Fumigant	Pounds	2.000	350	700.00
Plastic Mulch	Roll	75.000	3.5	262.50
Drip Tape	Foot	0.020	8700	174.00
Bee Hives	Per Each	35.000	2	70.00
Fungicide	Pounds	8.470	48	406.56
Miticides	Gallon	19.750	4	79.00
Insecticide	Gallon	20.600	1	20.60
Sulpher	Pounds	0.300	12	3.60
Boron	Pounds	0.300	0.5	0.15
Harvest	Per Each	0.250	19000	4,750.00
Container	Per Each	0.100	19,000.000	1,900.00
Advertisement	Pounds	0.020	19,000.000	380.00
Labor	Hours	8.000	71.250	570.00
Machinery Fuel, Lube, Repairs	Dollars	1.000	38.230	38.23
TOTAL OPERATING COSTS				11,749.10
FIXED COSTS		AMOUNT		VALUE
Machinery				
Interest at 7.150%		1.00		3,975.00
Depr, Taxes, Insurance		0.00		0.00
Irrigation				
Interest at 7.150%		0.00		0.00
Depr, Taxes, Insurance		0.00		0.00
Equipment				
Interest at 7.150%		0.00		0.00
Depr, Taxes, Insurance		0.00		0.00
Land				
Interest at 7.150%		0.00		0.00
Taxes		0.00		0.00
TOTAL FIXED COSTS				3,975.00
PRODUCTION	UNITS	PRICE	QUANTITY	VALUE
Strawberries	Pounds	1.15	19,000.00	21,850.00
TOTAL RECEIPTS				21,850.00
TOTAL RECEIPTS				21,850.00
TOTAL OPERATING COSTS				11,749.10
RETURNS ABOVE TOTAL OPERATING COSTS				10,100.90
TOTAL FIXED COSTS				3,975.00
RETURNS ABOVE ALL SPECIFIED COSTS				6,125.90

2011 NC FFA Farm Business Management

Problem Solving Section

Part 1 – Analysis of Cash Flow

27 points

Because cash revenue from farm operations varies widely from month-to-month, the Hardings want to assess their cash situation by quarter. In this section, completion the information about the Harding cash flow based on the information given below. Round to the nearest dollar. Each question is worth 3 points

Important note: The Hardings must maintain a minimum cash balance of \$3,000.

Quarter	1 st	2 nd	3 rd	4 th
Projected Cash Inflows	75,600	220,400	530,300	237,800
Projected Cash Outflows	196,500	230,700	220,100	250,600
Family Living	12,000	12,000	12,000	12,000
Cash difference		(22,300)	298,200	(24,800)
Beginning cash balance	22,900	3,000	3,000	161,800
Cash position			301,200	137,000
Money Borrowed this Period	113,000	22,300	0	0
Payment on Loan	0	0	139,400	0
Ending cash balance	3,000	3,000		137,000

What is the cash difference in the 1st quarter?

What is the cash position in the 1st quarter?

Which quarter has the largest cash inflow?

Which quarter has the smallest cash inflow?

What is the total inflow?

How much do they need to borrow each quarter to maintain the listed ending balance?

1st Quarter

2nd Quarter

3rd Quarter

4th Quarter

Part 2a – Analysis of Balance Sheets

44 points

Questions 1 through 11 refer to Harding Farm Business Table 1. Statements of Net Worth on page 4. For multiple choice questions, circle the correct response. For all other questions, write your answer in the blank. Round ratios to two decimals. Each question is worth 4 points.

1. What was Harding's Farm Business Current Ratio on December 31, 2009?

2. What was Harding Farm Business Current Ratio on December 31, 2010?

3. How much working capital did the Harding Farm Business have on December 31, 2010?

4. Which measure shows the size or magnitude of the amount of profitability?

- a) Equity-to-asset ratio
- b) Net worth
- c) Debt-to-asset ratio
- d) All of the above
- e) None of the above

5. Consider the change in liquidity on Harding Farm Business between December 31, 2009 and December 31, 2010. Based on the balance sheet information, was the farm business:

- a) More liquid on December 31, 2009
- b) More liquid on December 31, 2010
- c) Less liquid on December 31, 2010
- d) Both B and C
- e) None of the above

6. What was the Harding Farm Business Debt-to-Equity Ratio on December 31, 2009?

7. What percent of the Harding Farm Business assets were financed by debt on December 31, 2009?

8. Consider the change in solvency on Harding Farm Business between December 31, 2009 and December 31, 2010. Based on the balance sheet information, was the farm business:

- a) More solvent on December 31, 2009
- b) More solvent on December 31, 2010
- c) Less solvent on December 31, 2010
- d) Both A and C
- e) None of the above

9. What was Harding Farm Business Equity-to-Asset Ratio on December 31, 2010?

10. What percent of Harding Farm Business assets were financed by equity on December 31, 2010?

11. Assume the liability values are accurate and the asset values shown on the balance sheet accurately represent the values of the assets if the assets had been sold on the dates specified. If on December 31, 2010, Harding Farm Business had sold all assets and paid off all debts, how much money would the business have had left?

Part 2b – Analysis of Income Statements

24 points

Questions 1 through 6 refer to Harding Farm Business Table 1. Statements of Net Worth on page 4 and Table 2. Income Statements on page 5. Round your answers to two decimals. Each question is worth 4 points.

Important Notes:

- Opportunity Cost of Farm Equity is 8%
- Value of Unpaid Labor is \$45,000

1. What is the rate of return on assets in 2010?

_____ %

2. What is the rate of return on equity in 2010?

_____ %

3. What is the asset turnover ratio in 2010?

_____ %

4. What is the return to management in 2010?

\$ _____

5. What is the net farm income from operations ratio?

_____ %

6. If the Harding Farm Business had zero debt (i.e. a leverage ratio of zero), then the return on assets (ROA) and the return on equity (ROE) would be equal. However, in 2010 the ROE is greater than the ROA – which means they are earning a higher return on equity than on total investment in assets. This is due to which of the following relationships? [COD refers to cost of debt.]

- ROA = COD
- ROE > COD
- ROE < COD
- COD < ROA

Part 3 – Enterprise & Risk Management

37 points

This part of the exam contains three sections.

- A. Properly identifying variable and fixed costs is important in planning and developing enterprise budgets. For the following costs, identify whether each item is a variable cost or a fixed cost. Write a "V" in the blank if the item is a variable cost. Write an "F" in the blank if the item is a fixed cost. (1 point for each blank)

_____ Depreciation on machinery

_____ Hourly labor

_____ Insurance for machinery and equipment

_____ Salary labor

_____ Custom harvesting expenses

_____ Feed purchases

_____ Real estate taxes

_____ Interest on annual operating capital

_____ Fertilizer purchases

B. Review Table 3. Melons - Cantaloupe & Honeydew enterprise budget on page 6. Answer the following questions related to Mr. Harding's projections. (2 points each blank)

1. What is the expected yield per acre? _____ melons

2. What is the expected price for melons?
\$ _____ per melon

3. What are the expected costs per acre for bee hive rental?
\$ _____ per acre

4. What quantity of boron will be applied per acre?
_____ lbs.

5. What are the total receipts per acre?
\$ _____ per acre

6. If the price remains at \$0.75 per head and all costs remain unchanged, what is the break-even yield per acre to cover total operating costs? Round answer to nearest whole number.
_____ melons

7. What is the hired labor rate per hour?
\$ _____ per hour

- C. Mr. Harding has been concerned about the exposure to risk that they have experienced over the last several years. They have tried to eliminate some of the risk exposure from price variation by selling to a consortium of area restaurateurs. They currently have a contract for their fresh lettuces and are trying to decide if they should also have a contract for their melons, as this same consortium has expressed interest in such an arrangement. The enterprise budget for the melons operation (cantaloupe and honeydew) is found on the Table 3. Melons - Cantaloupe & Honeydew enterprise budget on page 6. Use that information to assist the Hardings in the following analysis of risk management.

Melons (Cantaloupe & Honeydew) are currently sold to area food co-ops, grocery chains and at a popular farmers market without a contract. Their price is determined at \$0.75 per melon, so there is no price risk to manage. There is, however, yield variability. Calculate the Risk Rated Expected Net Returns the Hardings can expect for melons at harvest. Round answers to two decimals.

Occurrence	Event Occurrence	Expected Yield (# of Melons)
30% above expected yield	1 (10 out of 100 times)	3,850
15% above expected yield	2 (20 out of 100 times)	4,675
Typical expected yield	3 (30 out of 100 times)	5,500
15% below expected yield	3 (30 out of 100 times)	6,325
30% below expected yield	1 (10 out of 100 times)	7,150

1. Risk Rated Expected Total Returns \$ _____(6)
2. Total Operating Costs \$ _____(2)
3. Total Fixed Costs \$ _____(2)
4. Risk Rated Expected Total Returns \$ _____(4)

Part 4 – Partial Budgeting

20 points

Proposed Change: Share-leasing strawberries (vs. melons on owned land).

The Harding Farm Business has been considering an increase in the acres of strawberries to replace some of the land he uses to grow melons. Mr. Harding is concerned that he cannot sell the increased quantity at the price projected in the budget and he is reluctant to increase his time requirements on the farm. As an alternative, he has discussed a possible share lease with a neighboring farmer. The Harding farm business would receive 33% of the crop yield and pay 20% of the operating costs. The neighboring farmer would raise strawberries on the Hardings' melon land on a share-lease basis. In addition, the tenant would rent irrigation and other machinery from the Hardings for \$200 per acre. The Harding farm business would lose the projected returns above operating costs for melons. Use the partial budget form to evaluate this proposed change in the Harding farm business.

Refer to pages 7 (Table 4. Strawberries, owned, harvest and market) and 6 (Table 3. Melons - Cantaloupe & Honeydew) for this section.

Using the form below, construct a partial budget to determine the expected change in net returns per acre from the given proposal. Note: Write "none" or "zero" in any category with no entry. Round answers to two decimal places. (2 points each blank)

<u>Added Returns</u>		<u>Reduced Returns</u>	
Subtotal	\$ _____	Subtotal	\$ _____
<u>Reduced Costs</u>		<u>Added Costs</u>	
Subtotal	\$ _____	Subtotal	\$ _____
Total AR+RC	\$ _____	Total RR+AC	\$ _____
Net Change \$ _____			

1. If Mr. Harding is confident in the projected budgets for corn and peppers including the projected price of peppers, should they make the change? (2 points) Circle the correct response.

YES

NO

2. At what price for strawberries would the Tuckers farm business find the partial budget difference to be zero? (4 points) Round to THREE decimal places.

\$ _____ per lb

Part 5 – Income Tax Management

21 points

Answer the following questions about the Harding Farm Business. Unless otherwise noted, use the straight-line method of depreciation.

1. In 2009, Mr. Harding bought a tractor for \$95,000. For his 2009 taxes, he claimed the full value of the tractor as a Section 179 deduction. For the purposes of his 2010 taxes, what is the adjusted basis of the tractor?

\$ _____ (2)

2. Mr. Harding bought a used tractor for \$55,000. In addition he paid \$1,650 in sales taxes and a \$200 dealer delivery charge. To finance the purchase he borrowed \$20,000 from his bank, and received a \$15,000 credit for his old trade-in. The balance he paid in cash. What is his basis?

\$ _____ (5)

3. For each of the items listed, place a L if it would be used in low income year and an H if it would be recommended for use in a high income year to make the best use of good tax planning for those years. (1 point each)

Item	Your Answer
Collect money due from custom work done	
Get every expense recorded which you are entitled	
Increase charitable contributions	
Borrow money at bank to pay outstanding accounts	
Use straight line depreciation	
Delay all possible expenditures	
Delay sales of livestock or crops	
Buy feed and other supplies for future use	
Sell capital items which are no longer useful	
Take option of reporting sealed grain as income	
Pay wages to family members	
Buy needed equipment for increased depreciation	
Depreciate major repairs on buildings	
Use Section 179 expensing rule	
Postpone payments on open accounts till next year	

4. Sherri works for the interior design store. She receives a salary and benefits, including medical insurance and a gym membership. The income from her off-farm job is subject to which of the following taxes? (4 points. Must have all three correct answers to earn points)
- a. Self-employment tax (15.3%)
 - b. Employee's portion of OASDI and Medicare (7.65%)
 - c. NC State income tax
 - d. Federal income tax
 - e. Capital gains tax
 - f. Corporate income tax

Part 6 - Capital Investment Analysis

27 points

- Based on the 2010 ending balance sheet (refer to Table 1. Statements of Net Worth) and the net income from operations in 2010 (refer to Table 2. Income Statements), and assuming the Hardings have 253 acres, if the Harding Farm Business sold their machinery, buildings and land for their balance sheet value and could reinvest at a 10% rate of return, would they earn more or less on a per acre basis than they did farming? 4 points. (Circle the correct response) (4 points)

MORE

LESS

- The Harding Farm Business currently owns and operates a tractor on 200 acres of farmland. The tractor no longer works and Mr. Harding is deciding between purchasing a new tractor, leasing a tractor from the local machinery dealer and operating it with in-house labor, and hiring the work he needs on a custom basis.

Depreciation Method	To calculate <u>yearly expense</u> :
Straight-line	$(\text{Full Purchase Price} - \text{Salvage Value}) / (\text{Useful life})$
150% Declining Balance	$(1.5 / \text{useful life}) * \text{Adjusted Basis}^a$

^aNote: Adjusted Basis = (Full Purchase Price – Cumulative Depreciation). For calculating depreciation in the first year, the Adjusted Basis = Full Purchase Price, since no depreciation has been taken.

Key Assumptions (Hint: Pay attention to the units.):

- Mr. Harding assumes the work he needs takes 2 hours per acre, regardless of whether the work is performed in-house or he contracts it out to someone else.
- Mr. Harding’s operating cost for doing the work himself is \$15 per acre including labor.
- The full purchase price for a new tractor is \$50,000, including all necessary implements. The useful life of the tractor is 7 years and has a salvage value of \$2,000.
- The cost for leasing a tractor and all necessary implements averages \$20 per hour. This is in addition to the operating cost per acre mentioned previously.
- Hiring the work done on a custom basis would cost \$25 per hour.

A. Cost of Owning and Operating the Machinery:

First, calculate the yearly depreciation expense, assuming Mr. Harding uses the straight-line method of depreciation. Show your work. Round to two decimals.

\$ _____ (2)

Based on your answer above, what is the additional fixed cost per acre for owning the tractor? Show your work. Round to two decimals.

\$ _____ (2)

Based on your answer above, what is the total cost per acre for owning and operating the tractor? Show your work. Round to two decimals.

\$ _____ (3)

If Mr. Harding decided to base his decision using 150% declining balance method of depreciation, what is the total cost per acre for owning and operating the tractor in the first year? Show your work.

\$_____ (4)

B. Cost of Hiring Work on a Custom Basis:

What is the additional fixed cost per acre for custom hiring tractor-related work?

\$_____ (2)

What is the total cost per acre for hiring tractor-related work on a custom basis? Show your work.

\$ 50 _____ (2) [\$25 * 2]

C. Cost of Leasing and Operating the Machinery:

First, calculate the yearly leasing expense. Show your work.

\$_____ (3)

What is the total cost per acre for leasing and operating the tractor? Show your work.

\$_____ (2)

D. Investment Analysis:

Which one of the four alternatives has the lowest cost per acre?
[check one] (3 points)

- Own and operate the tractor (using straight-line depreciation)
- Own and operate the tractor (using 150% declining balance depreciation)
- Hire the work done on a custom basis
- Lease the tractor

End of the 2011 NC FFA Farm Business Management Exam

Name: _____

Chapter: _____

2011 NC FFA			
Farm Business Management: Problem Solving			
Score Sheet			
		Possible Points	Contestant's Points
Part 1	Analysis of Cash Flow	27	
Part 2a	Analysis of Balance Sheets	44	
Part 2b	Analysis of Income Statements	24	
Part 3	Enterprise & Risk Management	37	
Part 4	Partial Budgeting	20	
Part 5	Income Tax Management	21	
Part 6	Capital Investment Analysis	27	
		200	