

1) (15 pts. total) Below is a simplified farm Balance Sheet.

a) (5 pts.) Use the information given and your knowledge of the relationships among Balance Sheet entries to fill in the **five** missing cells and then answer the questions below.

BALANCE SHEET	12/31/2010	12/31/2009		12/31/2010	12/31/2009
Current Assets	320,000	290,000	Current Liabilities	200,000	250,000
Non-Current Assets	660,000	630,000	Non-Current Liabilities	330,000	290,000
			Total Liabilities	530,000	540,000
			Equity	450,000	380,000
Total Assets	980,000	920,000	Total Liabilities & Equity	980,000	920,000

b) (3 pts.) Based on this Balance Sheet, what is the Current Ratio on 12/31/2010?

$$CR = \text{current assets} / \text{current liabilities} = 320,000 / 200,000 = 1.6$$

c) (3 pts.) Based on this Balance Sheet, what is the Debt to Asset Ratio on 12/31/2010?

$$DtoA = \text{total liabilities} / \text{total assets} = 530,000 / 980,000$$

d) (4 pts.) For each item below, identify whether it classified as a current asset, non-current asset, current liability, or a non-current liability **and briefly explain why**.

Machine Shed: *non-current asset, lasts more than 12 months*

Remaining Balance on 5-Year Tractor Loan: *non-current liability, due over 1 year in future*

Feed Store Bill due This Month: *current liability, due within 12 months*

Stored Grain: *current asset, liquid and easily sold*

2) (14 pts. total) Below is a simplified farm Income Statement.

a) (3 pts.) Use the given information and your knowledge of the relationships among Income Statement entries to fill in the **three** missing cells.

INCOME STATEMENT 12/31/2010 to 12/31/2011	
Crop Sales	300,000
Livestock/Dairy Sales	<input type="text" value="210,000"/>
Total Revenue	510,000
Operating Costs	<input type="text" value="320,000"/>
Interest Expenses	40,000
Total Costs	360,000
Net Farm Income from Operations	<input type="text" value="150,000"/>
Unpaid Labor and Management	80,000
Net Farm Income	70,000

Use the Income Statement above and the Balance Sheet in Question 1 to answer the questions below. Show how you calculate your answers for potential partial credit.

b) (4 pts.) What is this farm's Return on Assets? What is this farm's Rate of Return on Assets?

$$ROA = NFI + Interest = 70,000 + 40,000 = 110,000$$

$$ROROA = ROA/Average Assets = 110,000/[1/2(980,000 + 920,000)] = 11.58\%$$

c) (4 pts.) What is this farm's Return on Equity? What is this farm's Rate of Return on Equity?

$$ROE = NFI = 70,000$$

$$ROROE = ROE/Average Equity = 70,000/[1/2(450,000 + 380,000)] = 16.87\%$$

d) (3 pts.) What is this farm's Operating Profit Margin Ratio (i.e. Profit Margin)?

$$PM = ROA/Total Revenue = 110,000 / 510,000 = 21.6\%$$

3) (9 pts. total) Briefly and concisely answer each question below.

a) (3 pts.) What would be the problem (if any) if a farm had a debt to asset ratio of 1.5? What would be the problem (if any) if a farm had a debt to asset ratio of 0.15?

DtoA = 1.5 means the farm is insolvent and foreclosure is imminent—the farm owes \$1.50 for each dollar of assets it has. Big problems

DtoA = 0.15 means the farm owns 85% of the farm, which is generally not a problem. The only issue is that the farm may want to put some of its financial assets elsewhere, to reduce its risks (diversify) and/or may want to consider expansion.

b) (3 pts.) You are an egg farmer who sells eggs daily to a large stable company and regularly buy feed for the laying hens (you have little on farm storage). You generally have a current ratio around 1.10. Explain why this may or may not be a problem.

This is quite the low CR, meaning the farm could have problems with cash flow, especially if prices change or sudden emergencies arise, however, with constant sales, this current ratio may be okay, as dairies often have CR in the range of 1.3.

c) (3 pts.) Suppose a farm's debt to asset ratio decreased in each of the last 3 years and the farm's income statement showed that the farm business had negative net farm incomes. Give an explanation of how this could happen and why it is or is not a problem.

DtoA decrease is either due to an increase in asset value, such as due to using a market basis and the price the assets increasing, or due to a reduction in the debt, such as by paying off the debt more rapidly. The negative NFI is a problem, and for the farm to be paying off the assets, the $NFI < 0$ means it is using outside capital to pay down the debt possible (such as off-farm income). There are other possibilities.

4) (10 pts. total) Briefly and concisely answer each question below.

a) (4 pts.) For each item below, identify whether it classified as a cash or non-cash revenue or expense **and briefly explain why** it is considered a cash or non-cash item.

Fertilizer Purchase: *cash expense: receive a bill for the expense.*

Machinery Depreciation: *non-cash expense: a cost of production, but never receive a bill.*

Grain Inventory Increase: *non-cash revenue: value of grain increases, but don't a check.*

Hog Sale: *cash revenue: receive a check for this revenue*

b) (3 pts.) Briefly explain the difference between cash accounting and accrual accounting, using as an example, seed corn purchased in December of 2009 and planted in May 2010. How would cash accounting based on the calendar year and accrual accounting based on the crop season each treat this purchase for determining net farm income for the 2010 Income Statement?

Cash accounting puts the cost in the year it is incurred, though the item may actually be used for production in a different accounting period. Accrual accounting includes the costs in the accounting period in which the item is used. Thus for the seed, cash accounting would put the cost in 2009 and deduct it as an expense against the 2009 revenues and income for taxes, while accrual accounting would put the seed cost in 2010 and deduct it as an expense against the 2010 revenues and income for taxes. Thus the cost accounting would include the seed in the 2009 income statement, while accrual accounting would include it in the 2010 income statement.

c) (3 pts.) Briefly describe the depreciation rules for income tax purposes, focusing on salvage value, useful life and the annual depreciation rate. Specifically, if you buy a \$200,000 combine:

i) What salvage value must be used for the combine?

ii) How do you determine the useful life for the combine?

iii) In any given year, how do you determine the depreciation rate for the combine?

iv) Could you elect the full purchase price of the combine in the first year as depreciation?

i) \$0

ii) Set by law, look it up in a table, machinery is 7 years

iii) Also set by law, look it up in tax table as did in problem set (or see question 5c)

iv) Yes, section 179 allows farmer to take up to \$500,000 in depreciation in 2010 (amount carries by year) from the purchase price, potentially allowing persons to take the full purchase cost in the year of purchase.

5) (10 pts. total) You buy a tractor for \$50,000 with a useful life of 5 years.

a) (3 pts.) Fill in this table using Straight Line Depreciation assuming a \$10,000 salvage value. Show your work.

Year	Depreciation During Year	Value at Year End
1	8,000	42,000
2	8,000	34,000
3	8,000	26,000
4	8,000	18,000
5	8,000	10,000

$$D = (\text{purchase} - \text{salvage}) / \text{useful life}$$

$$D = (50,000 - 10,000) / 5 = \$8,000 \text{ per year}$$

b) (4 pts.) Fill in this table using Double Declining Balance Depreciation assuming no salvage value. Show your work.

Year	Depreciation During Year	Value at Year End
1	20,000	50,000 - 20,000 = 30,000
2	12,000	30,000 - 12,000 = 18,000
3	7,200	18,000 - 7,200 = 10,800
4	4,320	10,800 - 4,320 = 6,480
5	6,480	0

$$R_{DDB} = 2 \times 1/\text{useful life} = 2 \times 0.20 = 40\%$$

$$50,000 \times 40\% = 20,000$$

$$30,000 \times 40\% = 12,000$$

$$18,000 \times 40\% = 7,200$$

$$10,800 \times 40\% = 4,320$$

c) (3 pts.) Calculate depreciation for this tractor to claim for income tax purposes for year 3 and year 6, using a 7-year recovery period and the half-year convention based on the following table:

Year	Depreciation Rate
1	14.29%
2	24.49%
3	17.49%
4	12.49%
5	8.93%
6	8.92%
7	8.93%
8	4.46%

$$50,000 \times 17.49\% = 8,745$$

$$50,000 \times 8.92\% = 4,460$$

6) (9 pts. total) Suppose you just bought 100 acres of crop land, the only crop land you own.
a) (3 pts.) What is required for you to be eligible for a corn Direct Payment? Suppose you are eligible—what triggers a corn Direct Payment?

Own or rent Base acres and enroll with FSA, no trigger, base acres makes you eligible.

b) (3 pts.) What is required for you to be eligible for a corn Counter-Cyclical Payment? Suppose you are eligible—what triggers a corn Counter-Cyclical Payment?

Own or rent Base acres and enroll with FSA. Trigger: national marketing year average price less than target price minus direct payment rate.

c) (3 pts.) What is required for you to be eligible for a corn ACRE Payment? Suppose you are eligible—what triggers a corn ACRE Payment?

Own or rent Base acres and enroll with FSA. Trigger: Both state actual revenue < state revenue guarantee and actual farm revenue < farm revenue guarantee.

7) (8 pts. total) Mark the boxes to indicate your answers to the following questions.

a) (4 pts.) Suppose you own 15 acres of land that makes you eligible for a soybean Direct Payment. For each action below, would you Keep or Lose your soybean Direct Payment?

Action	Keep DP	Lose DP
Plant all 15 acres in corn	X	
Plant all 15 acres in alfalfa	X	
Plant all 15 acres in fresh vegetables to sell		X
Build apartments on the whole 15 acres		X

b) (4 pts.) Suppose you own 15 acres of crop land that makes you eligible for a corn Counter Cyclical Payment (CCP) and that conditions are right so that a corn Counter Cyclical Payment is triggered. For each action below, would you Keep or Lose the corn Counter Cyclical Payment?

Action	Keep CCP	Lose CCP
Plant all 15 acres in soybeans	X	
Harvest 300 bu/ac of corn from the 15 acres	X	
Sell your harvested corn for \$8/bu	X	
Sell your harvested corn for \$1/bu	X	

8) (8 pts. total) Provide short answers to each of the following questions.

Suppose your friend owns some land, planted it all in corn and harvested 15,000 bushels of corn.

a) (3 pts.) Assuming he is eligible, briefly explain how a Marketing Assistance Loan works and why your friend might want to use one.

Receive loan from government (CCC) using grain as collateral, at a set rate of some many \$/bu (the loan rate). Low interest loan, then pay back later and can forfeit the grain if the price has fallen below the loan rate and keep the loan. Useful to manage late season cash flow—pay off operating loans (often charging higher interest rates) and wait until later in the year when market prices tend to increase to sell your grain.

b) (2 pts.) Suppose he is eligible—what triggers a corn Loan Deficiency Payment?

On the day chosen to pay off MAL, if the posted county price < loan rate (PCP < LR), then receive a LDP = LR – PCP per bushel.

c) (3 pts.) Suppose he has been eligible to receive Direct Payments and Counter-Cyclical Payments, and has been using Marketing Assistance Loans. He decides to enroll in the ACRE Program. How does this change his Direct Payments, Counter-Cyclical Payments, and the Loan Rate for Marketing Assistance Loans?

DP: decreased 20%, CCP = 0\$ (all given up) and Loan Rate decreased 30%.

9) (8 total pts.) Suppose a farm has a 100 ac field of soybeans in one insured unit with an average yield of 40 bu/ac as established by crop insurance rules.

a) (3 pts.) Suppose the farmer buys 70% Yield Protection crop insurance. What is the per acre yield guarantee? What is the total yield guarantee for the full 100 ac unit?

$$70\% \times 40 \text{ bu/ac} = 28 \text{ bu/ac}$$

$$28 \text{ bu/ac} \times 100 \text{ ac} = 2800 \text{ bu}$$

b) (3 pts.) Suppose the farmer actually harvests 2,000 bushels from the unit. What is the insurance indemnity, assuming a 100% price election of \$12.00/bu?

$$(Guarantee - Actual) \times Price Election = (2800 - 2000) \times \$12/bu = \$9,600$$

c) (2 pts.) Suppose later that year, the farmer actually sold the 2,000 bu of soybeans for \$15/bu. How would that affect his crop insurance indemnity?

Does not affect indemnity—price election chosen when buy policy.

10) (9 total pts.) Suppose a farm has a 100 ac field of wheat in one insured unit with an average yield of 70 bu/ac as established by crop insurance rules and a \$7.00/bu Base Price.

a) (3 pts.) Suppose the farm buys 70% Revenue Protection crop insurance. What is the initial per acre revenue guarantee? What is the initial revenue guarantee for the 100 acre unit?

$$70\% \times 70 \text{ bu/ac} \times \$7/bu = \$343/ac$$
$$\$343/ac \times 100 \text{ ac} = \$34,300$$

b) (6 pts.) The price increases over the season so that the official harvest price is \$8.00/bu.

i) What would be the final per acre revenue guarantee?

Final guarantee uses the maximum of the base rice and harvest price. Here, max(\$7.00, \$8.00) =

$$\$8.00/bu, \text{ so: } 70\% \times 70 \text{ bu/ac} \times \underline{\$8/bu} = \$392/ac$$

ii) What would be the final revenue guarantee for the 100 acre unit?

$$\$392/ac \times 100 \text{ ac} = \$39,200$$

iii) Suppose the farmer actually harvests 4,000 bushels of wheat for the unit, what would be the insurance indemnity?

$$Actual Revenue = 4,000 \times \$8/bu = \$32,000$$

$$Indemnity = Guarantee Revenue - Actual Revenue = \$39,200 - 32,000 = \$7,200$$