

1) (25 pts. total) You are a hog farmer thinking of growing low phytate corn for your hog feed. Low phytate corn increases the bioavailability of phosphorus in corn so that hogs gain faster and the manure contains less phosphorus, but the seedcorn is more expensive and the corn yields lower as well. Conduct a partial budget analysis of growing low phytate corn for your hog feed.

- You currently farm with 1,000 acres of corn, with an average yield of 180 bu/ac. Use the corn market price of \$4.00/bu as the price (opportunity cost) of your raised corn.
- Low phytate corn costs an additional \$5/ac for the seed compared to conventional corn and yields 2% lower.
- With low phytate corn, the manure has lower phosphorus, so you can apply more manure per acre and thus do not have to haul the manure as far. You estimate that you could reduce your manure hauling costs by \$5,000 per year.
- Due to more rapid weight gain on low phytate corn, you estimate that you could sell 100 more hogs per year at a market weight of 250 lbs for a price of \$0.60/lb.

Ignore all other costs and benefits in your analysis. Show your work for potential partial credit.

a) (5 pts.) What is the Additional Revenues (if any)?

b) (5 pts.) What is the Additional Costs (if any)?

c) (5 pts.) What is the Costs Reduced (if any)?

d) (5 pts.) What is the Revenues Reduced (if any)?

e) (5 pts.) Use your numbers to fill in the Partial Budget below, and then calculate the Total Benefits, Total Costs, and Net Benefit.

<b>Additional Revenues</b>		<b>Additional Costs</b>	
<b>Costs Reduced</b>		<b>Revenues Reduced</b>	
<b>Total Benefits</b>		<b>Total Costs</b>	
		<b>Net Benefit</b>	

**2 a) (5 pts.)** Suppose you inherit some farm land. Your spouse wants you to plant native grasses and let the land return to prairie, because “It won’t cost us anything.” Briefly explain opportunity cost in this context.

**2 b) (5 pts.)** Briefly describe two different methods we discussed in class for determining machinery costs for budgeting purposes.

**3) (28 pts.)** These questions concern federal agricultural programs discussed in class.

a) (4 pts.) What triggers Direct Payments to farmers enrolled in commodity programs?

b) (4 pts.) What triggers Counter Cyclical Payments to farmers enrolled in commodity programs?

c) (4 pts.) What triggers Loan Deficiency Payments to farmers enrolled in commodity programs?

d) (4 pts.) What triggers ACRE Payments to farmers enrolled in commodity programs?

e) (5 pts.) Which program or programs make payments using Base Acres and Payment Yields?

f) (3 pts.) Which USDA Agency should farmers contact to learn about and to enroll in federal commodity programs such as ACRE and Loan Deficiency Payments?

g) (3 pts.) Which USDA Agency should farmers contact to learn about and to enroll in federal disaster assistance programs such as SURE?

h) (3 pts.) Who do farmers buy crop insurance from?

**4 a) (8 pts.)** For each type of crop insurance policy below, indicate whether it is an individual or area-wide (county) policy and whether it is a yield or revenue policy.

i) Crop Revenue Coverage (CRC):

ii) Actual Production History (APH):

iii) Group Risk Income Plan (GRIP):

iv) Group Risk Plan (GRP):

**4 b) (12 pts.)** Consider individual crop insurance.

i) What is meant by the coverage level?

ii) What triggers an indemnity payment for yield insurance?

iii) What triggers an indemnity payment for revenue insurance?

**5 a) (5 pts.)** You invest \$20,000 in your sister's farm to help her get started. She will pay back the \$20,000 in 5 years plus 5% interest compounded annually. How much will she owe you?

**5 b) (5 pts.)** How much money must be invested today earning a 4% interest rate compounded annually to have \$4,000 in 4 years?

**5 c) (5 pts.)** You have a field worth \$3,000/ac if you sell it today. If you wait 2 years, you are confident you can sell it for \$4,000/ac. Think of holding the land as an investment. What is the rate of return on holding the land expressed as an annually compounded interest rate?

**6 a) (15 pts.)** What is the net present value (NPV) for a ginseng garden that costs \$3,000 to plant in year 1, then costs \$500 in years 2 and 3, and then generates a net return of \$10,000 in year 4? Assume a 12% discount rate. Fill in the Present Value column in the table below. Show your work for potential partial credit.

Year	Net Return	Present Value
1	-3,000	
2	-500	
3	-500	
4	10,000	
	NPV	

**6 b) (5 pts.)** What is the annuity equivalent to the time varying returns from the ginseng garden?

The annuity factor formula is  $K = \frac{1}{r} \left( 1 - \frac{1}{(1+r)^t} \right)$ , so that the annuity is  $C = NPV/K$ .

Show your work for potential partial credit.

**7) (11 pts. total)** You are deciding the seeding rate for your corn. This table gives the seeds planted per acre (1000's of seeds per acre) and the yield (bu/ac).

Seeds (1,000's)	Yield (bu/ac)	Marginal Product	Value of Marginal Product
30	180	--	--
33	183		
36	185		
39	186		

**a) (5 pts.)** Use this table to show how to calculate the Marginal Product and then fill in the Marginal Product column in the table. Show your work for potential partial credit.

**b) (5 pts.)** Corn sells for \$4/bu. Show how to calculate the Value of Marginal Product for one example, and then fill in the Value of Marginal Product column in the table.

**c) (5 pts.)** If the cost of seed corn is \$2 for 1,000 seeds, what is the profit maximizing seeding rate based on the table above?

**8) (10 pts. total)** The table below reports the cost (\$/yr) of producing specialty turkeys (lbs/yr) for Tubby Tom's Terrific Turkeys® for making specialty turkey products.

Turkey (lbs)	Fixed Cost	Variable Cost	Total Cost	Marginal Cost
2,125	1,000	6,875		--
2,400	1,000	8,250		
2,629	1,000	9,625		
2,800	1,000	11,000		

**a) (6 pts.)** Use the table above, show how to calculate the Total Cost and Marginal Cost and then fill in the missing values in the table. Show your work for potential partial credit.

**b) (4 pts.)** If Tubby Tom's pays \$6.00/lb for turkeys, what is the profit maximizing amount of turkeys to produce for Tubby Tom's?

**9) (10 pts)** Assume lima bean yield is determined by this function:  $Y = 1 + 2P - 0.02P^2$ , where Y is yield (ton/ac) and P is applied phosphorus (lbs/ac). If the price of lima beans is \$25/ton and the price of applied phosphorus fertilizer is \$0.80/lb, what is the profit maximizing amount of phosphorus fertilizer to apply? **Don't forget to check the Second Order Condition.**

**10) (10 pts. total)** You buy a truck for \$90,000 that you plan to use for 3 years. For this questions, calculate annual depreciation of the truck assuming a \$0 salvage value.

**a) (5 pts.)** Fill in the table using Straight Line Depreciation. Show your work for potential partial credit.

Year	Depreciation During Year	Value at Year End
1		
2		
3		

**b) (5 pts.)** Assume you deducted the depreciation reported above from your ordinary income on your Schedule F each year. You sell the truck in year 4 for \$30,000 (not the \$0 salvage value). Do you pay ordinary income tax, self-employment tax, and/or capital gains tax on this \$30,000? In other words, what taxes are paid (if any) on depreciation recapture?

**c) (5 pts.)** Below is the IRS depreciation table for an asset with 7-year recovery period using the half year convention. Calculate depreciation for this truck to claim for income tax purposes for **year 3** and **year 8**, based on the table below:

Year	Depreciation Rate
1	10.71%
2	19.13%
3	15.03%
4	12.25%
5	12.25%
6	12.25%
7	12.25%
8	6.13%

**11) (5 pts.)** Briefly explain the “limited liability” that owners of a Limited Liability Company (LLC) typically have as a result of using this form of business arrangement rather than the other business arrangements (partnership, corporation, and sole proprietorship) discussed in class.

**12) (15 pts. total)** Jack and Kate own a farm, with all assets owned as marital property under Wisconsin's marital property law. Jack and Kate bought land years ago for \$250,000, but currently it has a fair market value of \$550,000. Give a brief explanation for each answer.

**a) (5 pts.)** Suppose Jack and Kate sell the land to their son Sawyer for \$550,000.

i) How much gain would Jack and Kate have to report on their income tax return?

ii) What is Sawyer's basis for the land?

**b) (5 pts.)** Suppose Jack and Kate give the land to son Sawyer and Jack and Kate have used none of their lifetime gift tax exclusions on previous gifts.

i) How much gift taxes would they have to pay on their gain in the land?

ii) What is Sawyer's basis for the land?

**c) (5 pts.)** Suppose Kate dies and then Jack gives the land to their s Sawyer.

i) After Kate dies, what is Jack's basis in the land?

ii) What is Sawyer's basis for the land?

**13) (20 pts. total)** Use the simplified Balance Sheet and Income Statement below to answer these questions. Show your work for potential partial credit.

<b>BALANCE SHEET</b>	<b>12/31/2008</b>	<b>12/31/2007</b>		<b>12/31/2008</b>	<b>12/31/2007</b>
Current Assets	120,000	100,000	Current Liabilities	80,000	70,000
Non-Current Assets	530,000	500,000	Non-Current Liabilities	350,000	360,000
			Total Liabilities	430,000	430,000
			Equity	220,000	170,000
Total Assets	650,000	600,000	Total Liabilities and Equity	650,000	600,000

a) (5 pts.) What is the Current Ratio on 12/31/2008?

b) (5 pts.) What is the Debt to Asset Ratio on 12/31/2008?

**INCOME STATEMENT 12/31/2006 to 12/31/2007**

Crop and Livestock Sales	400,000
Operating Expenses	300,000
Interest Expenses	25,000
Net Farm Income from Operations	75,000

c) (10 pts.) Assume the farm family paid themselves \$50,000 for their labor & management.

i) What is this farm's Return on Assets?

ii) What is this farm's Rate of Return on Assets?