

1) (20 pts. total, 2 pts. each) True or False? Mark your answer.

- a) T ___ F ___ Wisconsin is the world's largest cranberry production region, producing almost half of global production.
- b) T ___ F ___ Most Wisconsin corn and soybean growers insure their crops using Revenue Protection (RP) with a 70%-80% coverage level.
- c) T ___ F ___ Based on class lectures, many US corn and soybean farmers are losing money since their cost of production exceeds current and near-term prices.
- d) T ___ F ___ USDA data presented in class show that most small farmers (<\$250,000 in gross revenue) have done well in recent years, earning high farm income.
- e) T ___ F ___ Crop insurance premiums are subsidized so that most farmers pay less than half of the actuarially fair premium.
- f) T ___ F ___ Based on class lectures, crop insurance has become the primary way that the government supports commodity crop farmers.
- g) T ___ F ___ The Dairy Margin Protection Program is a USDA support program protecting farmers from declines in milk prices relative to feed costs.
- h) T ___ F ___ Based on class lecture, my sustainability research emphasizes farmer engagement and adoption of science-based practices.
- i) T ___ F ___ Based on our Let's Talk About It on Beginning Farmers, common advice was to invest heavily up front: "Start big or don't start at all!"
- j) T ___ F ___ The "Harvesting Tax Losses" article handed out in class reminds farmers to use income losses in a bad year to reduce taxes paid in previous years.

2) (16 pts. total) For the questions below, assume you are a farmer.

2a) (6 pts.) What is required for a farmer to be eligible to enroll for the potential to receive corn Price Loss Coverage (PLC) or County Agricultural Risk Coverage (County ARC) payments?

Suppose a farmer is eligible—what triggers a corn PLC Payment?

Suppose a farmer is eligible—what triggers a corn County ARC Payment?

2b) (4 pts.) If you are a farmer, where do you go to sign up/enroll or buy each of the following?

Action	Crop Insurance Agent	USDA Farm Service Agency
Agriculture Risk Coverage (ARC)		
Revenue Protection (RP)		
Price Loss Coverage (PLC)		
Area Revenue Protection (ARP)		

Mark the boxes to indicate your answers to the following questions.

2c) (3 pts.) Suppose you have a farm with 15 soybean base acres enrolled in County ARC. For each item below, would you Keep or Lose your eligibility for a soybean County ARC Payment?

Action	Keep	Lose
Plant the whole farm in soybean		
Plant the whole farm in alfalfa		
Convert the land into a rural housing development		

2d) (3 pts.) Suppose you own 15 soybean base acres enrolled in PLC with a Reference Price of \$8.40. For each action below, place an X in the box indicating how it would change your soybean PLC payment.

Action	Increase	Decrease	No Change
Plant soybeans on the land and sell them for \$8.50/bu			
Plant soybeans on the land and sell them for \$8.00/bu			
Plant potatoes on the land and sell them for chips			

3) (17 pts. total) Answer the questions below. Assume your farm has 100 corn base acres with a payment yield of 150 bu/ac ($100 \times 150 = 15,000$ bu of corn), but you actually you grew 20,000 bushels of corn, plus bought another 10,000 bushels, all to feed to your hogs.

3a) (5 pts.) Suppose you want to get a Marketing Assistance Loan (MAL). Place an X by ALL of the following options that are possible?

- A ___ Get a MAL using all 30,000 bu you actually own as collateral
- B ___ Get a MAL using the 15,000 bu of corn calculated for your base acres as collateral
- C ___ Get a MAL using only the 20,000 bu of corn you actually grew as collateral
- D ___ Get a MAL using 15,000 of the 20,000 bu of corn you actually grew as collateral
- E ___ None of these options, you are not eligible for a MAL

3b) (3 pts.) Assuming you are eligible and the corn loan rate is \$1.90/bu, what is the maximum Marketing Assistance Loan could you get?

3c) (6 pts.) Suppose you took out the maximum MAL for your corn. Place an X by **ALL** of the following cases in which you would receive a Loan Deficiency Payment.

- A ___ Pay back the MAL when the posted county price is less than the \$1.90 loan rate
- B ___ Pay back the MAL when the posted county price is greater than the \$1.90 loan rate
- C ___ Pay back the MAL when the National Marketing Year Average Price is less than the loan rate
- D ___ Pay back the MAL when the National Marketing Year Average Price is less than the Reference Price
- E ___ Pay back the MAL when the Chicago Mercantile Price is less than the loan rate
- F ___ You would receive a Loan Deficiency Payment under none of these conditions

3d) (3 pts.) What is the benefit to farmers for using Marketing Assistance Loans, even if they do not expect to receive Loan Deficiency Payments?

4) (10 pts. total) Suppose a farm has 150 acres of corn in one insured unit with an average yield of 170 bu/ac as established by crop insurance rules.

4a) (4 pts.) Suppose the farmer buys 70% Yield Protection (YP) crop insurance. What is the per acre yield guarantee? What is the total yield guarantee for the 150 ac unit?

4b) (4 pts.) Suppose the farmer were to actually harvest a yield of 140 bu/ac from the unit. How many bushels would the farmer harvest from the unit? What would be the insurance indemnity, if any, assuming a 100% price election of \$3.50/bu?

4c) (2 pts.) Suppose the farmer actually were to sell the harvested corn for \$3.00/bu in April. How much would the crop insurance indemnity change?

5) (12 pts. total) Suppose a farm has 120 acres of soybeans in one insured unit with an average yield of 50 bu/ac as established by crop insurance rules and the Base Price is \$9.00/bu.

5a) (4 pts.) Suppose the farm buys 75% Revenue Protection (RP) crop insurance. What is the initial per acre revenue guarantee? What is the initial revenue guarantee for the 120 acre unit?

For 5b and 5c, the price decreases over the season so that the official Harvest Price is \$8.00/bu.

5b) (2 pts.) What is the final revenue guarantee for the 120 acre unit?

5c) (2 pts.) Suppose the farmer actually harvests 4,800 bushels of soybeans from the unit, what would be the insurance indemnity, if any?

For 5d to 5f, the price increases over the season so that the official Harvest Price is \$10.00/bu.

5d) (2 pts.) What is the final revenue guarantee for the 120 acre unit?

5e) (2 pts.) Suppose the farmer actually harvests 4,800 bushels of soybeans from the unit, what would be the insurance indemnity, if any?

5f) (2 pts.) Suppose the farmer actually were to sell the harvested soybeans for \$8.00/bu in April. How much would the crop insurance indemnity change?

6 (12 pts.) Mark an X in each box to indicate which yield and price each program or policy uses.

	County Agricultural Risk Coverage	Area Revenue Protection	Revenue Protection
<u>Yield</u>			
Actual Farm			
County Average			
National Average			
<u>Price</u>			
Actual Farm			
Chicago Mercantile Exchange			
National Marketing Year Average			

7a) (2 pts.) What triggers an indemnity for the Area Yield Protection (AYP) crop insurance?

7b) (4 pts.) You insure 250 acres of corn with an Area Yield Protection (AYP) crop insurance policy with a 90% coverage level. The county yield guarantee is $90\% \times 150 \text{ bu/ac} = 135 \text{ bu/ac}$. Actual farm yield is 130 bu/ac, actual county yield is 120 bu/ac, the price election was \$3.50/bu, but you sell the corn for \$3.60/bu. What would be the total insurance indemnity?

7c) (4 pts.) Mark an X the box indicating how each event directly affects the AYP indemnity.

Event	Increase It	Decrease It	No Change
Harvest 170 bu/ac from your corn acres			
Sell your harvested corn for \$3.08/bu			
You are flooded and lose 50% of your yield			
Sell your harvested corn for \$3.90/bu			

8) (4 pts. total) Answer the following questions about business entities and liability.

8a) (2 pts.) Which business entities discussed in class (sole proprietor, partnership, C and S-corporations, limited liability company) must register with the state's Department of Financial Institutions to be a legal business entity?

8b) (2 pts.) Consider Partnerships, C-corporations, S-corporations, and Limited Liability Companies. Which of these pay taxes directly and which pass gains through to their owners?

Pay taxes on gains: _____

Pass gains through: _____

9) (8 pts. total) Provide short answers to these questions. Ron and Jane own a farm, with all assets owned as marital property with a right of survivorship under Wisconsin's marital property law. Among their assets is land worth \$500,000 with a tax basis of \$100,000 and hay worth \$50,000 with a \$0 tax basis (they raised it). Answer each question below.

9a) (2 pts.) If Ron and Jane sold the land to their son Mark for \$500,000 and the hay to him for \$50,000. How much gain must Ron and Jane report?

Land Gain = _____

Hay Gain = _____

9b) (2 pts.) Considering ordinary income tax, self-employment tax, and capital gain tax, which one or ones of these taxes would Ron and Jane owe on this gain from the land sale? Which one or ones of these taxes would Ron and Jane owe on this gain from the hay sale?

Taxes types owed on Land sale = _____

Taxes types owed on Hay sale = _____

9c) (2 pts.) After Mark buys them, what is his tax basis in the land and in the hay?

Land Basis = _____

Hay Basis = _____

9d) (2 pts.) If Jane died and then Ron gave the land to their son Mark, how much gain would Mark have to report if he sold the land soon thereafter for \$500,000 and the hay for \$50,000?

10) (9 pts.) You are a small farmer with 300 acres of soybeans, with an average yield of 40 bu/acre and an expected soybean price of \$9/bu. You are exploring switching from conventional tillage to no-till. Currently you hire a neighbor to do tillage and planting for \$35 per acre. If you switch to no-till soybeans, the cost would fall to \$20 per acre. Your current herbicide program to control weeds costs \$32 per acre, but with no-till soybeans, you expect it to increase to \$35 per acre. Lastly, no-till soybeans do not yield as well and you expect 2% lower yields.

a) (7 pts.) Use the information given above to conduct a partial budget analysis of this switch in tillage system by filling in the table below. Show your calculations in the space provided.

Benefits		Costs	
<u>Additional Revenues</u> What new revenue will be generated?		<u>Additional Costs</u> What new costs will be added?	
<u>Costs Reduced</u> What costs will be eliminated?		<u>Revenues Reduced</u> What revenues will be lost?	
Total Benefits		Total Costs	
Total Benefits – Total Costs = Net Benefit			

b) (2 pts.) Based on your results, considering only the money earned, is switching to no-till soybeans a money making change? Briefly explain.

11) (6 pts. total) You are deciding on irrigation water for your corn crop. This table gives the irrigation water applied (inches/ac) and the corn yield (bu/ac).

Water (inches/ac)	Yield (bu/ac)	Marginal Product	Value of Marginal Product
10	205	--	--
12	220		
14	230		
16	234		

11a) (2 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.

11b) (2 pts.) Corn sell for \$3.00/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.

11c) (2 pts.) If irrigation water costs \$15 per acre, what is the profit maximizing amount to apply based on the table above (you may need to interpolate between entries)?

12) (10 pts) Corn yield is $Y = 100 + 3X - 0.01X^2$, where Y is yield (bu/ac) and X is nitrogen fertilizer (lbs/ac). If the price of corn is \$3.00/bu and nitrogen fertilizer costs \$0.30/lb, what is the profit maximizing amount of nitrogen fertilizer to apply? **Don't Forget to Check the Second Order Condition.**

13) (8 pts. total) The table below reports the cost of producing mink for a fur farm

Mink (mink/year)	Fixed Cost	Variable Cost	Total Cost	Marginal Cost	Average Total Cost
900	5,000	83,000		--	
990	5,000	91,000			
1,070	5,000	99,000			
1,140	5,000	107,000			

13a) (3 pts.) Using the table above, show how to calculate Total Cost, Marginal Cost & Average Total Cost, then fill in the table's missing values. Show your work for potential partial credit.

13b) (2 pts.) Based on the information in the table, what is the profit maximizing number of mink to produce each year if mink sell for \$100 each?

13c) (3 pts.) Based on your Average Total Cost numbers in the table, if the farm produces and sells this many mink per year, will it earn a positive economic profit? How do you know?

14) (14 pts. total) In 2014 you bought a tractor for \$80,000.

14a) (2 pts.) For your farm accounts you plan to keep the tractor for 4 years. Calculate annual depreciation for the tractor assuming a \$20,000 salvage value. Fill in the table using Straight Line Depreciation. Show your work for potential partial credit.

Year	Depreciation During Year	Value at Year End
2014		
2015		
2016		
2017		

14b) (2 pts.) You have been depreciating the tractor you bought for \$80,000 for tax purposes using the IRS tax table below. Enter depreciation claimed in 2014 and 2015 in the table below.

Year	Tax Year	Depreciation Rate	Depreciation Claimed
1	2014	25.00%	
2	2015	21.43%	
3	2016	15.31%	
4	2017	10.93%	
5	2018	8.75%	
6	2019	8.74%	
7	2020	8.75%	
8	2021	1.09%	

14c) (2 pts.) What was your income tax basis in the tractor at the beginning of 2016?

14d) (2 pts.) If you sold the tractor at the beginning of 2016 for \$50,000, how much gain or loss would you report on your income tax return?

For parts e through g below, rather than using the table in part b, suppose instead you chose the Section 179 election and deducted the full cost of the tractor for your 2014 taxes.

14e) (2 pts.) What is your income tax basis in the tractor at the beginning of 2016?

14f) (2 pts.) If you sold the tractor at the beginning of 2016 for \$50,000, how much gain or loss would you report on your income tax return? Which of the following taxes would be owed for this gain: ordinary income, self-employment, and/or capital gains?

14g) (2 pts.) Briefly explain the tax benefit that farmers gain by choosing the Section 179 election for depreciating purchased machinery like this tractor.

15) (12 pts. total) Use the simplified Balance Sheet and Income Statement below to answer these questions. Show your work for potential partial credit.

BALANCE SHEET				1/1/2016	1/1/2015
Current Assets	350,000	360,000	Current Liabilities	250,000	220,000
Non-Current Assets	1,500,000	1,700,000	Non-Current Liabilities	450,000	460,000
			Total Liabilities	700,000	680,000
			Equity	1,150,000	1,380,000
Total Assets	1,850,000	2,060,000	Total Liabilities and Equity	1,850,000	2,060,000

15a) (2 pts.) What is the Current Ratio on 1/1/2016?

15b) (2 pts.) What is the Debt to Asset Ratio on 1/1/2016?

INCOME STATEMENT 1/1/2015 to 12/31/2015

Crop and Livestock Sales	740,000
Operating Expenses	810,000
Interest Expenses	60,000
Net Farm Income from Operations	-130,000

Assume the farm family paid themselves \$100,000 for their labor & management.

15c) (2 pts.) What is this farm's Return on Assets?

15d) (2 pts.) What is this farm's Rate of Return on Assets?

15e) (2 pts.) What is this farm's Return on Equity?

15f) (2 pts.) What is this farm's Rate of Return on Equity?