

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

- a) T ___ F ___ Wisconsin's is the third largest dairy state in the U.S., with total annual milk production third after California and Washington state.
- b) T ___ F ___ Most Wisconsin corn and soybean growers insure their crops using Area Yield Protection (AYP) with a 70%-80% coverage level.
- c) T ___ F ___ In the US, though most business may use accrual accounting, most farms use cash accounting.
- d) T ___ F ___ USDA data presented in class show that small farms are more likely to have low household income than large-scale farms.
- e) T ___ F ___ Crop insurance premiums are subsidized so that farmers pay less than the actuarially fair premium.
- f) T ___ F ___ One reason farmers use too much of some inputs (put some more on) is that underuse is obvious, overuse is invisible and the inputs are low cost.
- g) T ___ F ___ The Dairy Margin Protection Program created by the 2014 Farm Bill has been very popular with farmers, with no changes expected for 2019.
- h) T ___ F ___ After 3 years of low income, many farmers have been receiving large government payments and are struggling to invest their excess capital.
- i) T ___ F ___ Common advice from the Let's Talk About "Beginning Farmers" was not to worry about costs and personal finances until after the first season.
- j) T ___ F ___ Agricultural supply and food demand are relatively inelastic, so large price changes mean small quantity changes by farmers and food consumers.

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 Agriculture 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) (6 pts.) You operate a farm that has 40 corn base acres enrolled in County ARC. The county guarantee is \$575/ac for 2018. The USDA announces that the 2018 county average yield is 150 bu/ac and the USDA national marketing year average price is \$3.50. Your actual corn yield for the farm was 120 bu/ac and you sold the corn for \$4.00/bu. What is your 2018 County ARC payment for the farm? (Remember you only receive 85% of the full payment).

What is your 2018 County ARC payment if instead you sell your 2018 corn crop for \$3.20?

What is your 2018 County ARC payment if you receive an insurance indemnity of \$35 per acre?

What is your 2018 County ARC payment for corn if you only plant soybeans on the farm?

2c) (4 pts.) You operate a farm that has 30 soybean base acres enrolled in PLC with a 40 bu/ac payment yield. The 2018 USDA national marketing year average price is \$8.10, though you sell your crop for \$8.20/bu and harvested 35 bu/ac. The PLC Reference price is \$8.40/bu. What is your 2018 PLC payment for the farm? (Remember you only receive 85% of the full payment).

What is your 2018 PLC payment if you feed your 2018 soybean crop to your livestock?

3) (16 pts. total) Your farm has 200 corn base acres with a payment yield of 150 bu/ac, or $200 \times 150 = 30,000$ bu of corn. You planted 100 corn acres with 75% Yield Protection (YP) insurance and a guarantee of $75\% \times 170 \text{ bu/ac} \times 100 \text{ ac} = 12,750$ bushels. Your harvested yield averaged $200 \text{ bu/ac} \times 100 \text{ acres} = 20,000$ bushels. You bought 15,000 bushels of corn from a neighbor.

3a) (5 pts.) Suppose you want to get a Marketing Assistance Loan (MAL). Place an X by ALL of the following options that you can use as collateral for a MAL.

- A _____ The 15,000 bushels of corn you bought from your neighbor
- B _____ The 12,750 bushels of corn from your YP yield guarantee
- C _____ The 30,000 bushels of corn from your base acres
- D _____ The 20,000 bushels of corn you harvested from your farm
- E _____ None of these, you need to have Revenue Protection (RP) to get a MAL

3b) (2 pts.) You use 10,000 bushels of eligible corn as collateral for a Marketing Assistance Loan (MAL). Using the corn loan rate is \$1.95/bu, how large would your loan be?

3c) (6 pts.) For this MAL, place an X by ALL of the following cases in which you would also receive a Loan Deficiency Payment.

- A ___ Pay back the MAL when the National Marketing Year Average Price is less than the target price for counter-cyclical payments
- B ___ Pay back the MAL using corn from your corn base acres
- C ___ Pay back the MAL with a PLC (Price Loss Coverage) or county ARC (Agriculture Risk Coverage) payment
- D ___ Pay back the MAL with a Yield Protection (YP) or Revenue Protection (RP) crop insurance indemnity
- E ___ Pay back the MAL when the Chicago Mercantile Exchange's November average of the December corn futures price is less than the loan rate
- F ___ You would not receive a Loan Deficiency Payment under any of these conditions

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

4) (10 pts. total) You insure 300 acres of corn in one unit with an average yield of 180 bu/ac.

4a) (4 pts.) You buy 80% Yield Protection (YP) crop insurance. What is your per acre yield guarantee? What is the total yield guarantee for your 300 ac unit?

4b) (4 pts.) You harvest a yield of 130 bu/ac from the unit. How many bushels do you harvest from the unit? What would be your insurance indemnity with a price election of \$4.00/bu?

4c) (2 pts.) Again, you harvest a yield of 130 bu/ac from the 300 acre unit. What would be your indemnity with a price election of \$4.00/bu if you sell the corn for \$3.00/bu in April?

5) (14 pts. total) Suppose a farm has 100 acres of soybeans in one insured unit with an average yield of 45 bu/ac as established by crop insurance rules and the Base Price is \$10.00/bu.

5a) (4 pts.) Suppose the farm buys 80% Revenue Protection (RP) crop insurance. What is the initial per acre revenue guarantee? What is the initial revenue guarantee for the 100 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 100 acre unit?

5c) (2 pts.) Suppose the farmer actually harvests 4,000 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 \$11.00/bu.

5d) (2 pts.) What is the final revenue guarantee for the 100 acre unit?

5e) (2 pts.) Suppose the farmer actually harvests 4,000 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 \$9.00/bu in May. 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 to determine payments. Note, each column will have at least one X for Yield and Price.

	PLC: Price Loss Coverage	AYP: Area Yield Protection	YP: Yield Protection
<u>Yield</u>			
Actual Farm Yield			
County Average Yield			
Payment Yield for Base Acres			
<u>Price</u>			
Actual Farm Price			
Chicago Mercantile Exchange Price			
National Marketing Year Average Price			

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

7b) (4 pts.) You insure 300 acres of corn with an Area Revenue Protection (ARP) crop insurance policy with a 90% coverage level. The base price is \$4.00/bu, so the initial county revenue guarantee is $90\% \times 160 \text{ bu/ac} \times \$4.00/\text{bu} = \$576/\text{ac}$. Actual county yield is 130 bu/ac, but actual farm yield is 140 bu/ac, the official harvest price is \$3.80/bu, but you sell the corn for \$3.50/bu. What would be the total insurance indemnity for all 300 acres?

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

Event	Increase It	Decrease It	No Change
You don't sell your corn, but feed it to livestock			
Flooding causes county yield to fall to 100 bu/ac			
Due to hail, your farm yield falls to 100 bu/ac			
Tariffs cause the harvest price to fall to \$3.40			

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 the business entities discussed in class (sole proprietor, partnership, C and S-corporations, limited liability company). The owners of which of these entities do not have their personal assets directly liable to pay the financial liabilities of the business?

9) (8 pts. total) Provide short answers to these questions. Jonathan and Taylor 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 \$300,000 with a tax basis of \$100,000 and corn worth \$50,000 with a \$0 tax basis (they raised it). Answer each question below.

9a) (2 pts.) If Jonathan and Taylor gave the land and corn to their son. How much gain must Jonathan and Taylor report for tax purposes?

Land Gain = _____

Corn Gain = _____

9b) (2 pts.) What is their son's tax basis in the land and in the corn?

Land Basis = _____

Corn Basis = _____

9c) (2 pts.) If their son then sold the land for \$300,000 and corn for \$50,000, how much gain must he report for tax purposes?

Land Gain = _____

Corn Gain = _____

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

Taxes types owed on Land sale = _____

Taxes types owed on Corn sale = _____

10) (9 pts.) On your farm you grow soybeans, with an average yield of 60 bu/acre and an expected soybean price of \$9/bu. You are considering whether to use a seed treatment for early season insects and diseases. Talking to the sales person, you estimate that it will increase your yield by 2%, but it costs \$15 per acre. Also, because you get better stand establishment, you can plant fewer seeds per acre, reducing your seed costs per \$10 per acre.

a) (7 pts.) Use the given information to conduct a partial budget analysis of this switch to using a seed treatment 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 (\$/ac)		Total Costs (\$/ac)	
Total Benefits – Total Costs = Net Benefit (\$/ac)			

b) (2 pts.) Based on your results, considering only the money earned, is buying the soybean seed treatment a profitable change? Briefly explain.

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

Nitrogen (pounds/ac)	Yield (bu/ac)	Marginal Product	Value of Marginal Product
90	180	--	--
100	185		
110	187		
120	188		

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 sells 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 nitrogen costs \$0.60 per pound, 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 $Y = 150 + 4W - 0.02W^2$, where Y is yield (bu/ac) and W is irrigation water (inches/ac). If the price of corn is \$3.00/bu and water costs \$10/inch, what is the profit maximizing amount of water to apply? **Don't Forget to Check the Second Order Condition.**

13) (8 pts. total) The table below reports the cost of producing duck eggs on your farm.

Eggs (dozens/year)	Fixed Cost	Variable Cost	Total Cost	Marginal Cost	Average Total Cost
15,000	10,000	83,000		--	
18,000	10,000	91,000			
20,000	10,000	99,000			
21,000	10,000	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 duck eggs (dozens) to produce each year if a dozen sell for \$4.00 each?

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

14) (14 pts. total) In 2016 you bought a used tractor for \$120,000.

14a) (2 pts.) For your internal farm accounting you plan to keep the tractor for 4 years. Calculate annual depreciation for the tractor assuming a \$40,000 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
2016		
2017		
2018		
2019		

14b) (2 pts.) You have been depreciating the tractor you bought for \$120,000 for tax purposes using the IRS tax table below. Enter depreciation claimed in 2016 and 2017 in the table below.

Year	Tax Year	Depreciation Rate	Depreciation Claimed
1	2016	25.00%	
2	2017	21.43%	
3	2018	15.31%	
4	2019	10.93%	
5	2020	8.75%	
6	2021	8.74%	
7	2022	8.75%	
8	2023	1.09%	

14c) (2 pts.) What was your income tax basis in the tractor at the beginning of 2018?

14d) (2 pts.) If you decided to sell the tractor at the beginning of 2018 for \$70,000, 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 2016 taxes.

14e) (2 pts.) What is your income tax basis in the tractor at the beginning of 2018?

14f) (2 pts.) If you sold the tractor at the beginning of 2018 for \$70,000, 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				1/1/2018	1/1/2017
Current Assets	410,000	480,000	Current Liabilities	350,000	320,000
Non-Current Assets	2,100,000	2,000,000	Non-Current Liabilities	650,000	660,000
			Total Liabilities	1,000,000	980,000
			Equity	1,510,000	1,500,000
Total Assets	2,510,000	2,480,000	Total Liabilities and Equity	2,510,000	2,480,000

15a) (2 pts.) What is the Current Ratio on 1/1/2018?

15b) (2 pts.) What is the Debt to Asset Ratio on 1/1/2018?

INCOME STATEMENT 1/1/2017 to 12/31/2017

Crop and Livestock Sales	1,060,000
Operating Expenses	860,000
Interest Expenses	70,000
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?

Suppose this course included an optional one day field trip to visit 2 or 3 farms, such as a large dairy farm, an organic or grazing dairy farm and/or a grain farm. We would depart campus at about 7 AM on a Tuesday or Thursday morning and return at about 4 or 5 PM. There would be no cost for transportation, as we would provide a van or bus. You would buy (or bring) your own lunch. You would also be responsible for arranging your own schedule around your other courses, work and any other responsibilities you may have.

How likely would you be to go on such a voluntary trip?

Very Likely _____ **Likely** _____ **Maybe** _____ **Probably Not** _____