

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

- a) T\_\_\_ F\_\_\_ Wisconsin's dairy industry maybe important in the U.S., but production in New York far exceeds WI production.
- b) T\_\_\_ F\_\_\_ Most Wisconsin corn and soybean growers insure their crops using Yield Protection (YP) with a 60%-80% coverage level.
- c) T\_\_\_ F\_\_\_ Based on lecturers in class, the cost of production for many corn and soybean farmers exceeds current and long-term prices.
- d) T\_\_\_ F\_\_\_ Data show that most farmers managing small farms (<\$250,000 in gross revenue) have not done well in recent years, earning low farm income.
- e) T\_\_\_ F\_\_\_ With the new Farm Bill, most subsidies to farmers now come as crop insurance premium subsidies, not commodity support payments.
- f) T\_\_\_ F\_\_\_ Based on class lecture, most farm households, both large and small, have significant off-farm income from other jobs.
- g) T\_\_\_ F\_\_\_ The Dairy Margin Protection Program is the new support program protecting farmers from declines in milk prices relative to feed costs.
- h) T\_\_\_ F\_\_\_ Based on lecturers in class, many farmers can expect more paperwork and record keeping to satisfy sustainability requirements.
- i) T\_\_\_ F\_\_\_ Life Cycle Assessments typically estimate the average amount of energy and water needed to produce, use and dispose of a consumer product.
- j) T\_\_\_ F\_\_\_ SCO (Supplemental Coverage Option) insurance is a new policy from the 2014 Farm Bill that lets farmers insure part of their RP deductible.

2) (17 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) (5 pts.)** If you are a farmer, where do you go to sign up/enroll or buy each of the following?

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

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

**2c) (3 pts.)** Suppose you have a farm with 20 corn base acres enrolled in County ARC. For each action below, would you Keep or Lose your eligibility for a corn County ARC Payment?

Action	Keep	Lose
Plant the whole farm in soybeans (a program crop)		
Plant the whole farm in alfalfa (a non-program crop)		
Convert the whole farm into a rural airport (a non-ag use)		

**2d) (3 pts.)** Suppose you have 20 corn base acres enrolled in PLC. For each action below, would you Keep or Lose your eligibility for a corn PLC Payment? (The corn Reference Price is \$3.70).

Action	Keep	Lose
Plant the whole farm in corn and sell it for \$3.50/bu		
Plant the whole farm in corn and sell it for \$4.10/bu		
Plant the whole farm in cabbage and to sell for sauerkraut		

**3) (12 pts. total)** Answer the questions below, assuming you grew 20,000 bushels of soybeans and bought another 10,000 bushels, all to process and feed to your dairy cows.

**3a) (3 pts.)** Suppose you want to get a Marketing Assistance Loan (MAL), which of the following options are you eligible for? (Mark **ALL** options that are possible)

- A\_\_\_ Get a MAL using only the 10,000 bu of purchased soybeans as collateral
- B\_\_\_ Get a MAL using all 30,000 bu as collateral
- C\_\_\_ Get a MAL using 15,000 bu of the 20,000 bu of soybeans you grew as collateral
- D\_\_\_ Get a MAL using only the 20,000 bu of soybeans you grew as collateral
- E\_\_\_ None of these options, you are not eligible for a MAL
- F\_\_\_ All of these options are possible for a MAL

**3b) (3 pts.)** If you are eligible and the soybean loan rate is \$5.00/bu, what is the maximum Marketing Assistance Loan could you get?

**3c) (3 pts.)** If you took out the maximum MAL for your soybeans, for which of the following cases would you receive a Loan Deficiency Payment? (Mark ALL that are correct)

- A\_\_ Pay back the MAL when the posted county price is less than the \$5.00 loan rate
- B\_\_ Pay back the MAL when the posted county price is greater than the \$5.00 loan rate
- D\_\_ Pay back the MAL on May 1 when the posted county price is \$5.50, but sell the soybeans on June 1 for \$4.80/bu
- C\_\_ Pay back the MAL on May 1 when the posted county price is \$4.80, but sell the soybeans on June 1 for \$5.50/bu
- E\_\_ You would receive a Loan Deficiency Payment under all of these conditions
- 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 a 70 ac field of corn in one insured unit with an average yield of 180 bu/ac as established by crop insurance rules.

**4a) (4 pts.)** Suppose the farmer buys 80% Yield Protection (YP) crop insurance. What is the per acre yield guarantee? What is the total yield guarantee for the 70 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 \$3.70/bu?

**4c) (2 pts.)** Suppose the farmer actually were to sell the harvested corn for \$3.50/bu in April. How much would the crop insurance indemnity change?

**5) (12 pts. total)** Suppose a farm has a 110 ac field of soybeans in one insured unit with an average yield of 45 bu/ac as established by crop insurance rules and a \$9.00/bu Base Price.

**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 110 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 110 acre unit?

**5c) (2 pts.)** Suppose the farmer actually harvests 4,400 bushels of soybeans from the unit, what would be the insurance indemnity, if any?

For 5d and 5e, 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 110 acre unit?

**5e) (2 pts.)** Suppose the farmer actually harvests 4,400 bushels of soybeans from the unit, what would be the insurance indemnity, if any?

**6 (10 pts. total)** Answer the following questions about crop insurance policy.

The federal government subsidizes crop insurance, paying about two-thirds of the “actuarially fair” premium for most farmers, so that, from a farmer’s perspective, the loss ratio is about 3.0 while the program loss ratio is around 1.0.

**6a) (4 pts.)** Explain the actuarially fair premium? For context, what is the actuarially fair premium for a policy that pays \$100/ac once every 5 years and \$0/ac the other 4 years?

**6b) (4 pts.)** Explain what a farmer loss ratio of 3.0 means in terms of expected average returns from buying crop insurance. For context, what does a farmer loss ratio of 3.0 mean in terms of an average indemnity for a policy that costs \$5 per acre?

**6c) (2 pts.)** In class, we saw maps of corn and soybean loss ratios by county across the Midwest. Which counties tended to have high loss ratios, counties with high average yields like Dane County or those with low average yields like Ashland County in northern Wisconsin?

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

**7b) (4 pts.)** You insure 200 acres of corn under an Area Revenue Protection (ARP) crop insurance policy in Smith County with a 90% coverage level. The county revenue guarantee is  $90\% \times 170 \text{ bu/ac} \times \$3.50/\text{bu} = \$535.50/\text{ac}$ . If actual county yield is 140 bu/ac and the harvest price is \$3.60, what would be the total insurance indemnity for your corn acres?

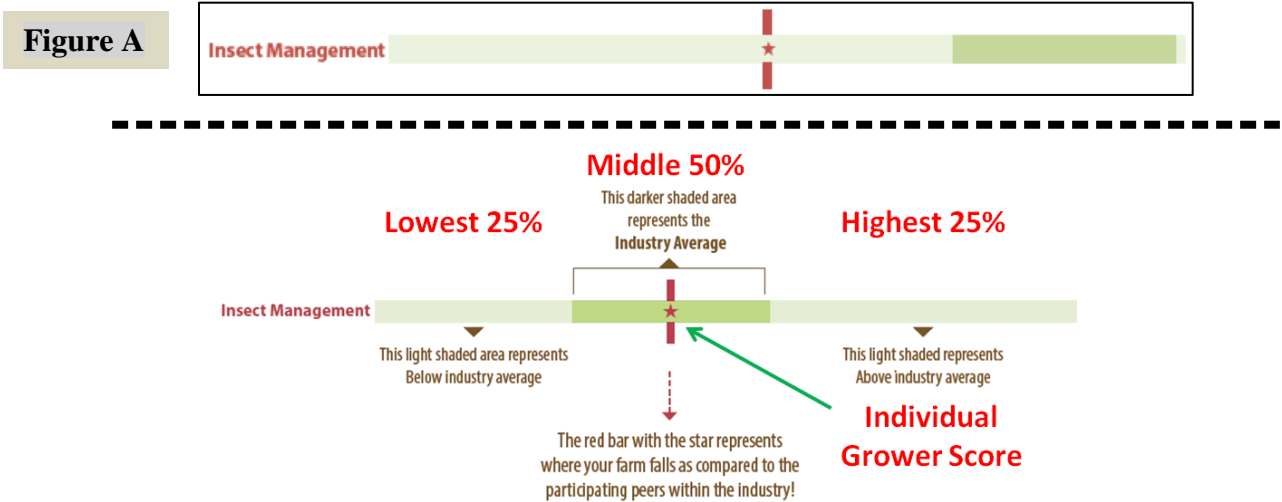
7c) (4 pts.) How does each event below affect the corn ARP indemnity?

Event	Not at All	Lose Indemnity
Harvest 170 bu/ac from your corn acres		
Sell your harvested corn for \$3.80/bu		
You are hit by hail and lose 75% of your yield		
Sell your harvested corn for \$3.30/bu		

8a) (3 pts.) Sustainability is commonly referred to as having three main elements or aspects. As discussed in class, which of the following name those three elements (Mark all that are correct).

- A\_\_\_ Energy, Equality and Environment
- B\_\_\_ Social, Economic, and Environmental
- C\_\_\_ Society, Science, and Satisfaction
- D\_\_\_ People, Profit and Planet
- E\_\_\_ Personnel, Practices, and Profits

In class, we looked at an example “Sustainability Dashboard” that presented results from a PCA + DEA analysis of farmer practice adoption intensity. **Figure A** below is an example for Insect Management from an actual assessment, while below it is a general explanation of these figures.



8b) (3 pts.) Based on **Figure A**, how is this farmer doing relative to his peers: above average, below average or about average? How do you know?

8c) (3 pts.) Use **Figure A** to comment on how the farmer population as a whole doing. Do most of the farmers use the recommended insect management practices or not? How do you know?

**9) (6 pts. total)** Answer the following questions about business entities and liability.

**9a) (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?

**9b) (2 pts.)** Which business entities discussed in class (sole proprietor, partnership, C and S-corporations, limited liability company) provide some limited liability to the owners?

**9c) (2 pts.)** When we say these entities have "limited liability" what is meant – liability for what is limited? Be brief.

**10) (16 pts. total)** Provide short answers to each of the following questions. Jon and Bob own a farm, with all assets owned as marital property with a right of survivorship under Wisconsin's marital property law. They have a son Mike. Among their assets is land worth \$800,000 with a tax basis of \$200,000 and \$100,000 of corn grain with a \$0 tax basis (they raised it). Answer each question below. Give a brief explanation for each answer.

**10a) (2 pts.)** If Jon and Bob gave the land and grain to Mike, what is Mike's income tax basis in the land and in the corn?

**10b) (2 pts.)** If Mike then sells the land for \$800,000 and the corn for \$100,000, how much gain must he report?

**10c) (2 pts.)** Considering ordinary income tax, capital gain tax, and self-employment tax, which one or ones of these taxes would Mike owe on this gain from the land sale? Which one or ones of these taxes would Mike owe on this gain from the grain sale?

**10d) (2 pts.)** If Jon died and then Bob gave the land to Mike, how much gain would Mike have to report if he sold the land soon thereafter for \$800,000 and the gain for \$100,000?

**10e) (1 pts.)** If Jon did not die, but instead Jon and Bob contributed the land to a Limited Liability Company (LLC) that the two of them completely owned and the next day their LLC sold the land for \$800,000, how much gain would the LLC realize?

**10f) (1 pts.)** Assume the LLC realizes gain from the sale, does it pay income tax on the gain? Do Jon and Bob (sole owners of the LLC) pay income tax on the gain?

**10g) (1 pts.)** Instead of selling the land, the LLC returns it back to Jon and Bob. Does the LLC and/or Jon and Bob have to pay income tax as a result of this transfer?

**10h) (1 pts.)** Instead Jon and Bob contributed the land to a C-Corporation that the two of them completely owned and the next day their Corporation sold the land for \$800,000, how much gain would the Corporation realize?

**10i) (2 pts.)** Assume the Corporation realizes gain from the sale, does it pay income tax on the gain? Do Jon and Bob (sole owners of the Corporation) pay income tax on the gain?

**10j) (2 pts.)** Instead of selling the land, the Corporation returns it back to Jon and Bob. Does the Corporation and/or Jon and Bob have to pay income tax as a result of this transfer?





**11) (6 pts. total)** You are deciding the potassium fertilizer for your corn crop. This table gives the potassium fertilizer applied in pounds per acre and the corn yield (bu/ac).

Potassium (lbs/ac)	Yield (bu/ac)	Marginal Product	Value of Marginal Product
40	195	--	--
50	200		
60	202		
70	203		

**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 \$4.00/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 potassium fertilizer 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  $Y = 100 + 2X - 0.01X^2$ , where Y is yield (bu/ac) and X is nitrogen fertilizer (lbs/ac). If the price of corn is \$4.00/bu and nitrogen fertilizer costs \$0.50/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)** This table reports the costs (\$/week) to produce chickens (number/week).

Chickens	Fixed Cost	Variable Cost	Total Cost	Marginal Cost	Average Total Cost
150	300	750		--	
160	300	800			
170	300	860			
180	300	940			

**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 chickens to produce each week if chickens sell for \$7.00 each?

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

**14) (14 pts. total)** In 2013 you bought a tractor for \$150,000.

**14a) (2 pts.)** For your farm accounts you plan to keep the tractor for 4 years. Calculate annual depreciation for the tractor assuming a \$50,000 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
2013		
2014		
2015		
2016		

**14b) (2 pts.)** You have been depreciating the tractor you bought for \$150,000 for tax purposes using the IRS tax table below. Enter depreciation claimed in 2013 and 2014 in the table below.

Year	Tax Year	Depreciation Rate	Depreciation Claimed
1	2013	25.00%	
2	2014	21.43%	
3	2015	15.31%	
4	2016	10.93%	
5	2017	8.75%	
6	2018	8.74%	
7	2019	8.75%	
8	2020	1.09%	

**14c) (2 pts.)** What is your income tax basis in the tractor at the beginning of 2015?

**14d) (2 pts.)** If you sold the tractor at the beginning of 2015 for \$90,000, 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 a, suppose instead you chose the Section 179 election and deducted the full cost of the tractor for your 2013 taxes.**

**14e) (2 pts.)** What is your income tax basis in the tractor at the beginning of 2015?

**14f) (2 pts.)** If you sold the tractor at the beginning of 2015 for \$90,000, 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.

<b>BALANCE SHEET</b>	<b>12/31/2014</b>	<b>12/31/2013</b>		<b>12/31/2014</b>	<b>12/31/2013</b>
Current Assets	320,000	300,000	Current Liabilities	190,000	180,000
Non-Current Assets	680,000	630,000	Non-Current Liabilities	380,000	360,000
			Total Liabilities	570,000	540,000
			Equity	430,000	390,000
Total Assets	1,000,000	930,000	Total Liabilities and Equity	1,000,000	930,000

**15a) (2 pts.)** What is the Current Ratio on 12/31/2014?

**15b) (2 pts.)** What is the Debt to Asset Ratio on 12/31/2014?

**INCOME STATEMENT 12/31/2013 to 12/31/2014**

Crop and Livestock Sales	320,000
Operating Expenses	180,000
Interest Expenses	30,000
Net Farm Income from Operations	110,000

Assume the farm family paid themselves \$70,000 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?