Below are several questions that will ask you to demonstrate your understanding of how crop insurance works. You will likely have to use the class overheads and/or the materials posted on the class web page to answer some of them.

A. Yield Insurance

Suppose a farm has 160 acres of corn in one insured basic unit with an actual production history (APH) average yield of 170 bu/ac.

1. If the farmer buys 80% Yield Protection (YP) crop insurance, what would be the per acre yield guarantee? What would be the yield guarantee for the whole 160 acre unit?

   Per Acre Yield Guarantee: \(0.80 \times 170 \text{ bu/ac} = 136 \text{ bu/ac}\)

   Unit Yield Guarantee: \(136 \text{ bu/ac} \times 160 \text{ ac} = 21,760 \text{ bu}\)

2. If the farmer actually harvested 18,400 bushels from the unit (an average of 115 bu/ac), what would be the YP indemnity, assuming a 100% price election of $3.88/bu?

   \(18,400 \text{ bu} < 21,760 \text{ bu}, \text{ the unit yield guarantee, which triggers an indemnity}\)

   Yield Loss = \(21,760 – 18,400 = 3,360 \text{ bu}\)

   Indemnity = \(3,360 \text{ bu} \times 3.88 = 13,036.80\)

3. How would the indemnity for question 2 change if the farmer actually sold the corn for $4.10/bu?

   There is no indemnity change. The indemnity is calculated using the price election, not the actual selling price. The farmer may never sell the grain, but feed it to livestock.

4. If instead the farmer actually harvested 22,400 bushels from the unit (an average of 140 bu/ac) and sold the corn for $3.70/bu, what would be the YP indemnity, assuming a 100% price election of $3.88/bu?

   \(22,400 \text{ bu} > 21,760 \text{ bu}, \text{ the unit yield guarantee, so no indemnity, Indemnity = 0}\)

Suppose the farmer instead bought a corn Area Yield Protection (AYP) policy in a county with an average yield of 165 bu/ac. The farmer buys a AYP policy with a 90% coverage level, so the county yield guarantee is \(0.90 \times 160 \text{ bu/ac} = 148.5 \text{ bu/ac}\). The farmer enrolls all 160 corn acres.

5. If the county average yield is 145 bu/ac and the farmer chose the $3.88/bu price election, what would be the AYP indemnity?

   \(145 \text{ bu} < 148.5 \text{ bu yield guarantee, which triggers an indemnity}\)

   Yield Loss = \(118.5 – 145 = 3.5 \text{ bu/ac}\)

   Indemnity = \(3.5 \text{ bu/ac} \times 3.88 \times 160 \text{ ac} = 2,240\)

6. How would the AYP indemnity change if the farmer’s actual yield was 170 bu/ac and sold the corn for $4.10/bu?

   There is no indemnity change. The indemnity is calculated using the county yield (not the farmer’s actual yield) and the price election, not the actual selling price.
**B. Revenue Insurance**

Suppose a farm has 200 acres of soybeans in one insured unit with an actual production history (APH) average yield of 48 bu/ac and the Revenue Protection (RP) base price is $9.17/bu.

1. If the farm buys 75% Revenue Protection crop insurance, what would be the initial per acre revenue guarantee? What would be the initial revenue guarantee for the 200 acre unit?

   **Per Acre Revenue Guarantee**: 75% \(\times\) 48 bu/ac \(\times\) $9.17/bu = $330.12/ac
   
   **Unit Revenue Guarantee**: $330.12/ac \(\times\) 200 ac = $66,024

2. What is the final per acre revenue guarantee and unit guarantee if the officially announced harvest price is $10.55/bu? What if the officially announced harvest price were $8.44/bu?

   The final guarantee is calculated using the maximum of the initial Base Price and the Harvest Price. Maximum of Base Price ($9.17) and Harvest Price ($10.55) is $10.55, so revenue guarantee is updated: 75% \(\times\) 48 bu/ac \(\times\) $10.55/bu = $379.80/ac \(\times\) 200 ac = $75,960 for the unit.

   If the Harvest Price is $8.44, the final guarantee is the same as the initial guarantee, or $66,024 for the unit (or $330.12/ac).

Suppose the farm actually harvests 6,000 bushels from the unit (an average of 30 bu/ac).

3. If the officially announced harvest price is $10.55/bu, what would be the RP indemnity?

   Maximum of Base Price ($9.17) and Harvest Price ($10.55) is $10.55, so guarantee is updated to $75,960 for the unit.
   
   Actual Revenue = 6,000 bu \(\times\) $10.55/bu = $63,300 < $75,960 guarantee, so triggers indemnity = $75,960 – $63,300 = $12,660 (or $63.30/ac)

4. Suppose the farm locked in a forward contract and sold the soybeans for $9.82/bu with March delivery, how does the RP indemnity change?

   Not at all. Actual revenue for calculating the indemnity uses the officially announced harvest price, not the actual price the farmer sells the grain for.

Suppose the farm instead bought a soybean Area Revenue Protection (ARP) policy in a county with an approved average yield of 50 bu/ac and the farmer chose a 90% coverage level. If the base price is $9.17/bu, then the initial county revenue guarantee is 90% \(\times\) 50 bu/ac \(\times\) $9.17/bu = $412.65/ac. The farmer enrolls all 200 soybean acres.

5. If the actual county average yield for the year is 45 bu/ac and the officially announced ARP harvest price is $10.55/bu, what would be the ARP indemnity?

   Maximum of Base Price ($9.17) and Harvest Price ($10.55) is $10.55, so guarantee updates to 90% \(\times\) 50 bu/ac \(\times\) $10.55/bu = $474.75/ac.
   
   Actual County Revenue = 45 bu/ac \(\times\) $10.55/bu = $474.75/ac, which exactly equals the guarantee, so no indemnity is triggered.

6. How would the ARP indemnity change if the farm’s actual yield was 35 bu/ac and it sold its grain for $9.62/bu? How would the ARP indemnity change if the farm’s actual yield was 55 bu/ac and it sold its grain for $10.75/bu?

   In both cases, not at all. Actual revenue for calculating indemnities uses the officially announced harvest price and county yields, not the farm’s yield or actual price received.