AAE 320 Problem Set #8   **Due December 14, 2022**   **Name_____KEY_____**

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 90 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 90 acre unit?

    Per Acre Yield Guarantee: 80% x 170 bu/ac = 136 bu/ac
    Unit Yield Guarantee: 136 bu/ac x 90 ac = 12,240 bu

2. If the farmer actually harvested 11,700 bushels from the unit (an average of 130 bu/ac), what would be the YP indemnity, assuming a 100% price election of $5.90/bu?

    11,700 bu < 12,240 bu, the unit yield guarantee, which triggers an indemnity
    Yield Loss = 12,240 – 11,700 = 540 bu
    Indemnity = 540 bu x $5.90 = $3,186.00

3. How would the YP indemnity for question 2 change if the farmer actually sold the corn for $5.50/bu?

    There is no indemnity change. The indemnity is calculated using the price election, not the actual selling price. The farmer may not even sell the grain, but can feed it to livestock.

4. If instead the farmer actually harvested 12,600 bushels from the unit (an average of 140 bu/ac) and sold the corn for $5.40/bu, what would be the YP indemnity, assuming a 100% price election of $5.90/bu?

    12,600 bu > 12,240 bu the unit yield guarantee, so no indemnity is triggered, Indemnity = $0

Suppose the farmer instead bought a corn Area Yield Protection (AYP) policy in a county with an average yield of 180 bu/ac. The farmer buys a AYP policy with a 90% coverage level, so the county yield guarantee is 90% x 180 bu/ac = 162 bu/ac. The farmer enrolls all 90 corn acres.

5. If the county average yield is 150 bu/ac and the farmer chose the $5.90/bu price election, what would be the AYP indemnity?

    150 bu < 162 bu yield guarantee, which triggers an indemnity
    Yield Loss = 162 – 150 = 12 bu/ac
    Indemnity = 12 bu/ac x $5.90 x 90 ac = $6,372.00

6. How would the AYP indemnity change if the farmer's actual yield was 140 bu/ac and sold the corn for $5.50/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 110 acres of soybeans in one insured unit with an actual production history (APH) average yield of 50 bu/ac and the Revenue Protection (RP) base price is $14.33/bu.

1. If the farm buys 70% Revenue Protection crop insurance, what would be the <u>initial</u> per acre revenue guarantee? What would be the <u>initial</u> revenue guarantee for the 110 acre unit?

   Per Acre Revenue Guarantee: 70% x 50 bu/ac x $14.33/ bu = $501.55/ac
   Unit Revenue Guarantee: $501.55/ac x 110 ac = $55,170.50

2. What is the <u>final</u> per acre revenue guarantee and unit guarantee if the officially announced harvest price is $14.40/bu? What if the officially announced harvest price were $13.81/bu?

   The final guarantee is calculated using the maximum of the initial Base Price and the Harvest Price. Maximum of Base Price ($14.33) and Harvest Price ($14.40) is $14.40, so revenue guarantee is updated: 70% x 50 bu/ac x $14.40/bu= $504.00/ac x 110 ac = $55,440.00 for the unit.

   If the Harvest Price is $13.81, the final guarantee is the same as the initial guarantee, or $55,170.50 for the unit (or $501.55/ac).

Suppose the farm actually harvests 3,520 bushels from the unit (an average of 32 bu/ac).

3. If the officially announced harvest price is $14.40/bu, what would be the RP indemnity?

   Maximum of Base Price ($14.33) and Harvest Price ($14.40) is $14.40, so the guarantee is updated to $55,440.00 for the unit.
   Actual Revenue = 3,520 bu x $14.40/bu = $50,688 < $55,440 guarantee, so it triggers an indemnity = $55,440 – $50,688 = $4,752 (or $43.20/ac)

4. Suppose the farm locked in a forward contract and sold the soybeans for $14.28/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 52 bu/ac and the farmer chose a 90% coverage level. If the base price is $14.33/bu, then the initial county revenue guarantee is 90% x 52 bu/ac x $14.33/bu = $670.64/ac. The farmer enrolls all 110 soybean acres.

5. If the actual county average yield for the year is 46 bu/ac and the officially announced ARP harvest price is $13.81/bu, what would be the ARP indemnity?

   Maximum of Base Price ($14.33) and Harvest Price ($13.81) is $14.33, so guarantee is 90% x 52 bu/ac x $14.33/bu = $670.64/ac.
   Actual County Revenue = 46 bu/ac x $13.81/bu = $635.26/ac, so it triggers an indemnity = $670.64/ac – $635.26/ac = $35.38/ac x 110 ac = $3,892.24.

6. How would the ARP indemnity change if the farm's actual yield was 35 bu/ac and it sold its grain for $13.76/bu? How would the ARP indemnity change if the farm's actual yield was 55 bu/ac and it sold its grain for $15.75/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.