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

**Farm Facts:** Suppose a farmer owns a 160 acre FSA farm that includes 90 base acres for corn with a 160 bu/ac payment yield and 50 base acres of soybeans with a payment yield of 40 bu/ac. On that FSA farm in 2018, the farmer planted 110 ac of corn that had an average yield of 180 bu/ac, and 40 acres of soybeans that had an average yield of 60 bu/ac, and has 10 acres of alfalfa that overall cuttings yielded 6 tons/ac.

Suppose that in September 2019, the USDA announced that the 2018 national marketing year average price is $3.61 for corn and $8.38 for soybeans. Suppose the farm is in Smith County, WI (not real) and the USDA announced a 2018 county ARC guaranteed of $685/ac for corn and $415 for soybeans for Smith County, WI. Suppose in June 2019, the USDA announces that the actual 2018 average corn yield in Smith County is 171 bu/ac and 46 bu/ac for soybeans.

**A. Price Loss Coverage (PLC)**
Suppose the farmer signed up for PLC for both the corn and soybeans.

1. What events trigger a corn PLC payment and a soybean PLC payment for this farm?
   
   *National marketing year average prices below the effective reference prices of $3.70 for corn and $8.40 for soybeans.*

2. What are the farm’s PLC payments for the 2018 crop year?

   *Corn PLC payment rate = $3.70 – $3.61 = $0.09*
   
   *Corn PLC payment = 85% x 90 corn base acres x 160 bu/ac x $0.09/bu = $1,101.60*
   
   *Soybean PLC payment rate = $8.40 – $8.38 = $0.02*
   
   *Soybean PLC payment = 85% x 50 soybean base acres x 40 bu/ac x $0.02/bu = $34.00*

3. How would the PLC payments change if the farmer had planted all 160 acres in soybeans?

   *PLC payments would not change, as they depend on the crops with base acres, not actual planted acres, as long as it stays in an agricultural use and is not a vegetable or fruit crop.*

4. How would the PLC payments change if the farmer had planted all 160 acres in alfalfa?

   *PLC payments would not change, as they depend on the crops with base acres, not actual planted acres, as long as it stays in an agricultural use and is not a vegetable or fruit crop.*

5. How would the farm’s PLC payments change if the farmer used futures markets to sell the corn for $3.75/bu and the soybeans for $9.18/bu?

   *PLC payments would not change, as they depend on national marketing year average prices, not actual prices the farmer receives for the crops.*
6. How would the farm’s PLC payments change if the farmer had sold the corn at harvest for $3.20/bu and the soybeans for $8.10/bu?
   
   *PLC payments would not change, as they depend on national marketing year average prices, not actual prices the farmer receives for the crops.*

7. How would the farm’s PLC payments change if the farm’s actual harvested yields for 2018 were 110 bu/ac for the corn and 28 bu/ac for the soybeans?
   
   *PLC payments would not change, as they depend on payment yields for base acres, not actual yields for the crops.*

B. County Agricultural Risk Coverage (ARC)

Instead, suppose the farmer signed up for county ARC for both the corn and soybeans.

1. What events trigger a county ARC payment for corn and for soybean for this farm?
   
   *Actual county revenue for a crop less than the county revenue guarantee for that crop.*

2. What are the farm’s county ARC payments for the 2018 crop year?
   
   *Actual county revenue is calculated as actual county average yield x national marketing year average price. ARC payment rate is the revenue guarantee minus the actual county revenue, with this payment rate equal to zero if this difference is negative and this payment has a maximum amount equal to 10% of the county guarantee.*

   For corn, actual county revenue = 171 x $3.61 = $617.31, which is less than the county revenue guarantee of $685/ac, so an ARC payment is triggered.
   
   ARC payment rate = 685 – 617.31 = $67.69/ac, which is less than the max ARC payment rate of 10% of county guarantee = 10% x $685 = $68.50/ac, and so the ARC payment rate is $67.69/ac.
   
   ARC payment = 85% x 90 corn base acres x $67.69/ac = $5,178.29.

   For soybean, actual county revenue = 46 x $8.38 = $385.48, which is less than the county revenue guarantee of $415/ac, so an ARC payment is triggered.
   
   ARC payment rate = 415 – 385.48 = $29.52/ac, which is less than the max ARC payment rate of 10% of county guarantee = 10% x $415 = $41.50/ac, and so the ARC payment rate is $29.52/ac.
   
   ARC payment = 85% x 50 soybean base acres x $29.52/ac = $1,254.60.

3. How would the ARC payments change if the farmer had planted all 160 acres in corn?
   
   *ARC payments would not change, as they depend on the crops with base acres, not actual planted acres, as long as it stays in an agricultural use and is not a vegetable or fruit crop.*

4. How would the ARC payments change if the farmer had planted all 160 acres in alfalfa?
   
   *ARC payments would not change, as they depend on the crops with base acres, not actual planted acres, as long as it stays in an agricultural use and is not a vegetable or fruit crop.*
5. How would the farm’s PLC payments change if the farmer used futures markets to sell the corn for $3.75/bu and the soybeans for $9.18/bu?

   *ARC payments would not change, as they depend on actual county revenue which uses the national marketing year average price, not the farmer’s actual price received.*

6. How would the farm’s PLC payments change if the farmer had sold the corn at harvest for $3.20/bu and the soybeans for $8.10/bu?

   *ARC payments would not change, as they depend on actual county revenue which uses the national marketing year average price, not the farmer’s actual price received.*

7. How would the farm’s PLC payments change if the farm’s actual harvested yields for 2018 were 110 bu/ac for the corn and 28 bu/ac for the soybeans?

   *ARC payments would not change, as they depend on actual county revenue which uses the county average yield, not the farm’s actual yield.*

C. Marketing Assistance Loans

1. How many bushels of corn and of soybeans did the farmer harvest in 2018?

   Corn: 110 acres x 180 bu/ac = 19,800 bu.
   Soybean: 40 acres x 60 bu/ac = 2,400 bu.

2. If the farmer enrolled all of the harvested corn and half of the harvested soybeans, how large of a Marketing Assistance Loan would the farm receive using the national loan rates of $1.95 for corn and $5.00 for soybeans?

   Corn: enroll 19,800 at $1.95/bu corn loan rate = $38,610.
   Soybean: enroll ½ of 2,400 bu = 1,200 bu at $5.00/bu soybean loan rate = $6,000.
   Total MAL = $38,610 + $6,000 = $44,610.

3. The farmer pays back the corn Marketing Assistance Loan on January 15th when the posted county price is $3.55/bu. Would the farmer receive a Loan Deficiency Payment? Ignoring interest payments and processing fees, how much does the farmer pay back?

   *No loan deficiency payment pays since posted county price of $3.50/bu exceeds the corn loan rate of $1.95/bu. Thus the farmer would pay back the same amount borrowed against the corn, or, ignoring interest payments and processing fees $38,610.*

4. Suppose instead the farmer pays back the corn Marketing Assistance Loan on April 1st when the posted county price is $1.90/bu. Would the farmer receive a Loan Deficiency Payment? Ignoring interest payments and processing fees, how much does the farmer pay back?

   *Yes, because posted county price ($1.90) is less than the loan rate ($1.95). The farmer would pay back the loan at the $1.90/bu posted county price – the farmer received $38,610 as a loan, but pays back $1.90 x 19,800 = $37,620, or $990 less than borrowed. The farmer receives a $0.05/bu loan deficiency payment, since 0.05 x 19,800 = $990.*