AGRÓNOMY 375
EXAM II

November 4, 2005

There are 13 questions (plus a bonus question) worth a total of up to 100 points possible. Please be concise.

6 pts. 1. A seed corn production field is scheduled to produce the single cross hybrid A X B (A is the seed parent while B is the pollen parent). Previous experience with these inbreds indicates that inbred B reaches pollen shed about 45 Growing Degree Days (GDD) quicker than inbred A reaches silking. Please note two ways that a seed corn production manager might deal with this difference in inbred developmental rates in order to best accomplish the intended cross in this field?

a)

b)

6 pts. 2. Why is seed corn generally harvested;

a) At high moisture (30 to 35% moisture versus commercial corn at less than 25%)?

b) On the ear (as compared with commercial corn which is generally shelled by a combine at harvest)?

5 pts. 3. Note five farmer-specific crop system management components which could impact the relative performance of corn hybrids (these illustrate the concept that the most useful corn hybrid performance trials for a given producer are those conducted on or near their farm using their own or very similar management).

a)

b)

c)

d)

e)
4 pts  4. A corn hybrid is listed as 110 days relative maturity from planting to physiological maturity. How would this hybrid be listed in terms of GDD relative maturity? (please show your work for partial credit)

________ GDD relative maturity from planting to physiological maturity

10 pts.  5. Briefly describe five factors which may contribute to increased harvested yield and/or farm profit potential when corn is planted early (e.g. April 25 vs. May 15) in central Indiana. Please explain each answer briefly.
   a)
   
b)
   
c)
   
d)
   
e)

4 pts.  6. What soil temperature and soil depth threshold indicates that planting may now begin for early (e.g. before May 1) planted corn in central and west central Indiana?

2 pts.  7. Note an example of conditions where a pre-sidedress nitrate soil test (PSNT) might be a meaningful tool to use in determining sidedressed N rate for corn.

10 pts.  8. Explain the specific reasoning behind the each of the following conditions which are recommended as prerequisites when considering a possible Fall application of nitrogen fertilizer. (Please note that this question continues on the next page.)
   a) Use ammonia (e.g. anhydrous ammonia or DAP) fertilizer form only.
   
b) Soil temperature at or below 50 degrees F.
c) Fall apply N only at northern latitudes.
d) Fall apply N only on soils with C.E.C. greater than 10.

e) Fall apply only on well drained soils

10 pts.  9. Note two advantages for side dressing N for corn during the first 30 days of growth as opposed to the application of N in the preceding Fall or pre-plant in the Spring.

a) 

b) 

The following information pertains to questions 10, 11 and 12.

Corn Yield Goal: 225 bu/acre  
Previous Crop: 58 bu/acre soybeans  
P₁ Soil Test: 37 ppm available P/acre  
K Soil Test: 155 ppm exchangeable K/acre  
C.E.C. = 14 meq / 100 grams of soil

0 – 46 - 0 is to be applied in the Fall to meet the total annual P₂O₅ requirement.  
20 pounds of N will be applied at planting as starter fertilizer using UAN solution at 28 % N.  
During the first 30 days of the season the remainder of N fertilizer will be sidedressed, using anhydrous ammonia at 82% N.  
Please make the appropriate fertilizer recommendations for next year's corn crop (please include your calculations).

7 pts.  10. a) Total pounds of N to be applied as fertilizer per acre (include N from both starter UAN and side dressed NH₃).

2 pts.  b) Pounds of NH₃ to be side-dressed per acre:

13 pts.  11. Annual P₂O₅ (pounds P₂O₅ per acre):
2 pts. Annual pounds 0-46-0 per acre:

13 pts. 12. Annual $K_2O$ (pounds per acre):

2 pts. Total annual pounds 0-0-60 per acre.

4 pts. 13. Note two conditions where the application of $P_2O_5$ or $K_2O$ as a side-banded "starter" may be expected to produce a yield increase greater than a broadcast application at the same $P_2O_5$ or $K_2O$ fertilizer rate.

   a) 

   b) 

5 pts. **BONUS** Please list 5 production or end use corn inbred traits for which corn breeders may select as they develop and choose inbred lines to combine into elite single cross corn hybrids for the future.

   a) 

   b) 

   c) 

   d) 

   e)