There are 14 questions (plus a bonus question) worth a total of up to 100 points possible. Please be concise.

4 pts. 1. A corn hybrid is advertised as having a relative maturity of 2938 GDD (from planting to physiological maturity). This equates to approximately how many days relative maturity (planting to physiological maturity)? Please show your work and round your answer to the nearest day.

4 pts. 2. Note two management-specific components of a corn production system which can vary widely from producer to producer and which might influence the relative ranking of corn hybrids in a performance trial (i.e. note two reasons for on-farm testing of corn hybrids under the prevailing management conditions of that farm).

   a)

   b)

10 pts. 3. Briefly describe five factors which contribute to increased corn yield and/or profit potential for corn planted early (e.g. April 25 vs. May 15) in central Indiana.

   a)

   b)

   c)

   d)
4. Explain the reasoning behind the recommendations that Fall applications of nitrogen for Indiana Corn should only be in an ammonia form, on soils at or below 50 degrees F, with N-Serve, at somewhat northern latitudes, and only on soils with C.E.C. greater than 10 meq / 100 grams.

5. How might poor soil drainage contribute to N deficiency visible mid to late season for corn in a wet year, even when recommended N rates were properly applied pre-plant in the Spring?

6. 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.
   a)
   b)

The following information pertains to questions 7, 8, and 9

Corn Yield Goal: 180 bu/acre

Previous Crop: 50 bu/acre soybeans

N fertilizer is to be applied one week prior to planting as anhydrous ammonia (NH₃ at 82% N content).

Please make the appropriate fertilizer recommendations for next year's corn crop (include your calculations).

7. a) Total pounds of N to be applied as fertilizer per acre.
   
   2 pts. b) Pounds of anhydrous ammonia (NH₃ at 82% N) to be applied per acre:

5 pts. 8. a) Annual maintenance P₂O₅ (pounds P₂O₅ per acre):
2 pts.  b) Total annual pounds 0-46-0 per acre:

5 pts.  9.  a) Annual maintenance $K_2O$ (pounds per acre):

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

6 pts.  10. 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)

12 pts.  11. A portion of a row is uncovered to check planter calibration in the field. The following distances are recorded between successive seeds in this row segment. Row width is 30 inches. Please show your work.

4 inches
2 inches
15 inches
3 inches
1 inches

a) The actual seeding rate for this row segment is

_________ seeds/acre

b) What level of standard deviation (from uniform spacing) is presented in this row segment?

c) What yield loss due to poor precision is likely at this level of planting precision?
12 pts. 12. A given field in west central Indiana was in soybeans in 2002 and in corn in 2003. The 2003 plant population was approximately 26,000 plants per acre.

a) When should the field be scouted in order to determine the need for a soil-applied insecticide to be applied at planting to achieve economic control of corn rootworm larvae in the 2004 corn crop which is planned for this field? Please explain this timing.

b) Under these conditions, what is the appropriate economic threshold above which an at-plant soil insecticide should be applied to control corn rootworm larvae in the 2004 corn crop?

c) This field will be going to soybeans in 2005 and back to corn in 2006. What scouting procedure and economic threshold should be implemented in 2005 to assess the need for at plant application of soil insecticide to avoid economic loss to corn rootworm larva feeding on the 2006 corn crop?

6 pts. 13. What combination of Black Cutworm larval development (e.g. young vs. old) and plant age (e.g. young vs. old seedling) would present the greatest potential for economic loss to this pest? Why?
You are scouting a European Corn Borer infested corn field with intent to determine the need for an application of an insecticide to control this first generation population. In walking the field you note that the crop is at a late whorl stage (extended leaf height 45 inches) and that there is an average of 1 live borer per infested plant. 70% of the plants are infested. Assume that the value of the corn crop is $2.25/bushel and that the expected yield is 180 bu/acre. Assume a control effectiveness of 80% for an applied insecticide. The cost of an insecticide treatment to control European Corn Borer is $15 per acre. Would it pay to treat or not to treat? Please show your work. The accompanying table of yield losses to European Corn Borer is from Purdue's publication E-17.

Yield Loss By European Corn Borer At Various Corn Growth Stages

<table>
<thead>
<tr>
<th>Plant stage</th>
<th>Percent yield loss - # borer/plant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Early whorl</td>
<td>5.5</td>
</tr>
<tr>
<td>Late whorl</td>
<td>4.4</td>
</tr>
<tr>
<td>Pre-tassel</td>
<td>6.6</td>
</tr>
<tr>
<td>Pollen shedding</td>
<td>4.4</td>
</tr>
<tr>
<td>Blister</td>
<td>3.0</td>
</tr>
<tr>
<td>Dough</td>
<td>2.0</td>
</tr>
</tbody>
</table>

BONUS Tillage is most likely to reduce economic loss by which of the following insects in continuous corn? Please explain your answer.

Black Cutworm, Corn Rootworm, European Corn Borer