10 pts. 1. You are scouting a European Corn Borer infested corn field with intent to determine the need for an application of an insecticide for control of this pest. In walking the field you note that the crop is at the R2 stage. There is an average of 2 live borers per plant. There is also an average 0.25 egg masses per plant and you observe that 20% of the plants are infested. Assume that the value of the corn crop is $2.00/bushel and that the expected yield (absent European Corn Borer damage) is 200 bu/acre. Assume that the cost of an insecticide treatment to control European Corn Borer is $15 per acre.

Table from Purdue publication E-17

<table>
<thead>
<tr>
<th>Plant stage</th>
<th>Percent yield loss - # borers/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>Blisterr</td>
<td>3.0</td>
</tr>
<tr>
<td>Dough</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Calculate the preventable economic loss, compare that loss with cost of treatment, determine if insecticide treatment is advised and explain your decision. Please show your work for full credit.
2. Please note the following as they pertain to Corn growth;
   a) Approximate kernel moisture content (percent of weight) at R5.
   b) Visible indicator that Corn has reached the R2 growth stage.
   c) Visible indicator that Corn has reached the R4 growth stage.

3. Compare the drought tolerance of soybean yield to that of corn yield and provide two reasons for the greater yield stability of the most drought-tolerant crop.

4. Briefly discuss the suitability of the U.S. Midwestern (e.g. Indiana, Illinois, Iowa) climate for corn production. Please be thorough and include the advantages and disadvantages of this region’s climate as they affect corn production.
5. a) What is the optimum seeding date for Soft Red Winter Wheat in the Midwestern U.S.? (Note: Your answer should apply equally well to any location in the Soft Wheat area.)

b) What is the range of Hessian Fly Free Dates for Indiana (northern to southern).

6. a) What is the optimum established stand density for Soft Red Winter Wheat in Indiana?

_________________________ plants / square foot

b) If a given drill row width is 9 inches how many inches of drill row distance (one row wide) constitutes a square foot of area for purposes of drill calibration? Please show your work for full credit.

7. The following pertain to a proposed crop of Indiana wheat;

Yield goal = 100 bushels per acre

Previous crop = 60 bushels of soybeans per acre

20 pounds of N are to be applied per acre at seeding with the balance of N to be applied as a topdressing in the Spring.

a) What Spring topdressed N rate is appropriate to recommend?

_______ Lbs. N / Acre

b) What maintenance P2O5 rate should be applied?

_______ Lbs. P2O5 / Acre

c) What maintenance K2O should be applied?

_______ Lbs. K2O / Acre

8. At what wheat developmental stage should topdress N be applied in the Spring? Why at this stage? Please be specific and provide at least two reasons.
9. Describe a typical weed control program for Soft Red Winter Wheat produced in Indiana. Please be thorough and explain your answer.

10. Note the appropriate maintenance P\textsubscript{2}O\textsubscript{5} and K\textsubscript{2}O rates for a 55 bushel per acre soybean yield. (Please show your work).

\[
\begin{align*}
\text{Lbs. P}_2\text{O}_5 / \text{Acre} & = \_\_\_\_ \_\_ \\
\text{Lbs. K}_2\text{O} / \text{Acre} & = \_\_\_\_ \_\_ \\
\end{align*}
\]

11. Compare a Maturity Group II vs. a Maturity Group III indeterminate soybean variety with respect to each of the following (assume both are planted on the same day at the same location in central Indiana, in the same row width and at the same population).

a) Flowering date of Maturity Group II vs that of Maturity Group III.

b) Mature plant height of Maturity Group II vs that of Maturity Group III.

12. Assume a hoop with diameter 35 inches has been used to estimate stand counts in a drilled soybean field. An average of 30 plants were surrounded
by the hoop in this field. What is the estimated stand density for this field? (Please show your work).

13. Is there a greater average yield advantage for drill-row (e.g. 7 inch row width) vs. wide row (e.g. 30 inch) soybeans in northern Indiana or in southern Indiana? Why? Please assume that properly adapted soybean varieties are planted in a timely fashion for full season growth in both locations.

14. Note a quantifiable characteristic which uniquely indicates that a soybean plant is at each of the following:

2 pts. a) R 2 growth stage?

2 pts. b) R 3 growth stage?

2 pts. c) R 4 growth stage?

2 pts. d) R 5 growth stage?

2 pts. e) R 6 growth stage?

8 pts. 15. a) What is the approximate recommended established population for Indiana Soybeans in drill row spacing (e.g. 6 inch row width)?

_________________ plants per foot of row.
b) What is the approximate recommended established population for Indiana Soybeans in wide row spacing (e.g. 30 inch row width?)

___________ plants per foot of row.

___________ plants per acre.

5 pts. BONUS. Please note the correct growth stage of the following plant.

HAVE A GREAT SUMMER!
CONGRATULATIONS TO THE GRADUATES!