

Name _____

AGRONOMY 375
EXAM III
May 7, 2009
100 points possible

There are 14 questions plus a Bonus question. Each question requires a short answer. Please be thorough yet concise and show your work where calculations are involved.

10 pts.

1. You are scouting Bt refuge corn rows infested with European Corn Borer to determine the need for a rescue application of an insecticide for control of this pest. In walking the field you note that the crop is at pollen shedding. There is an average of 1 live second generation borers per plant (on leaves in the ear zone, on the tassel in the leaf axil and behind the leaf sheath). There is also an average 0.5 egg masses per plant. 70% of the plants are infested or show feeding damage. Assume that the value of the corn crop is \$5.50/bushel and that the expected yield (absent European Corn Borer damage) is 210 bu/acre. Assume that the cost of an insecticide treatment to control European Corn Borer is \$15 per acre.

Plant stage	Percent yield loss - # borers/plant		
	1	2	3
Early whorl	5.5	8.2	10.0
Late whorl	4.4	6.6	8.1
Pre-tassel	6.6	9.9	12.1
Pollen shedding	4.4	6.6	8.1
Blister	3.0	4.5	5.5
Dough	2.0	3.0	3.7

Table from Purdue publication E-17

Please 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.

- 10 pts. 2. Describe each of the following for commercial dent corn in central Indiana:
- a) V stage at which the growing point is first above ground.
 - b) The number of the node which is at the top of the first visibly elongated internode seen when splitting the base of a corn stalk.
 - c) Visible indicator that a plant has reached R3.
 - d) Visible indicator that a plant has reached R5.
 - e) Kernel moisture content (percent of weight) when the milk line (or starch line) is half way between the crown and the tip of a kernel.
- 4 pts. 3. For a medium texture soil at field capacity, approximately how much water (inches) is available to young corn plants with roots reaching down 36 inches into the soil profile?
- 6 pts. 4. Compare the drought tolerance of soybean yield to that of corn yield. Provide at least two reasons for the greater yield stability of the most drought-tolerant crop.
- 6 pts. 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 this Soft Red Winter Wheat producing area.)
- 4 pts. b) Please give two reasons for this seeding date goal.
- 8 pts. 6. a) What is the optimum established stand density for Soft Red Winter Wheat in Indiana?

_____ plants / square foot

b) How many inches of row length comprise one square foot of area where row width is 7 inches ?

_____ inches of row length / square foot

7. The following pertain to a proposed crop of Indiana wheat;
Yield goal = 100 bushels per acre
Previous crop = soybeans
(Please show your work.)
- 2 pts. a) What total N rate is appropriate to recommend?
_____ Lbs. N / Acre
- 1 pt. Part of this N total will be applied just before seeding and the balance as a top dress application. Approximately how much of this N should be recommended for top dressing?
_____ Lbs. N / Acre
- 3 pts. b) What maintenance P₂O₅ rate should be applied per acre?
_____ Lbs. P₂O₅ / Acre
- 3 pts. c) What maintenance K₂O rate should be applied per acre?
_____ Lbs. K₂O / Acre
- 3 pts. 8. At what wheat developmental stage should topdress N be applied in the Spring ?
- 4 pts Why at this stage ? Please be specific and provide two reasons for this timing.
a)
- b)
- 4 pts. 9. Note the appropriate maintenance P₂O₅ and K₂O rates for 60 bushel per acre soybeans. (Please show your work).

_____ Lbs. P₂O₅ / Acre

_____ Lbs. K₂O / Acre

10. 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).

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

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

6 pts. 11. a) What is the approximate recommended established population for Indiana Soybeans in 6 inch row width?

_____ plants per foot of row.

_____ plants per acre.

b) What is the approximate recommended established population for Indiana Soybeans in 15 inch row width?

_____ plants per foot of row.

_____ plants per acre.

c) What is the approximate recommended established population for Indiana Soybeans in 30 inch row width?

_____ plants per foot of row.

_____ plants per acre.

3 pts. 12. a) Please describe a situation in which soybeans produced in drill row width (e.g. 6 inch row spacing) would be expected to yield more bushels per acre than soybeans produced in wide rows (e.g. 30 inch row spacing).

3 pts. b) Please explain your answer.

8 pts. 13. Note a **quantifiable characteristic** (i.e. identified by the size or position of a plant part) which uniquely indicates that a soybean plant is at each of the following;

a) R 2 growth stage?

b) R 3 growth stage?

c) R 4 growth stage?

d)R 5 growth stage?

8 pts. 14. Assume a hoop with diameter 30 inches has been used to estimate stand counts in a drilled soybean field. The average plant density in the area surrounded by the hoop was 22. What is the estimated stand density for this field? (Please show your work).

_____ Plants / Acre

5 pts. BONUS. Please describe the key characteristics which indicate that a soybean plant is at V3 or if you prefer, please draw a plant at the V3 growth stage and label the drawing, indicating the uppermost leaf node with leaf margins no longer touching.

**HAVE A GREAT SUMMER!
CONGRATULATIONS TO THE GRADUATES!**