

Agronomy 212

Name: _____

Second Exam

Exam number: _____

Spring 2006

Section I. Please answer either (a) True or (b) False. (20 points)

1. Late planting of corn results in shorter plants that are less susceptible to lodging.
2. About 50% of the days during the critical spring planting period for corn in Iowa are suitable for fieldwork.
3. Corn is less likely to receive rainfall in early July in the central Corn Belt than at any other time during the growing season.
4. The term “plant population” refers to the number of plants per acre that are actually in the field at any given time. In corn, this term is typically used to indicate the final stand density at harvest.
5. Corn stand density has increased by about 1,500 to 2,000 plants per acre (300 to 400 plants/acre/year) in the U.S. Corn Belt over the most recent five-year period.
6. Based on data from ISU Extension, the optimum stand density for corn in Iowa is currently 28,000 to 32,000 plants per acre.
7. The best plant population for corn yield is usually the best for maximizing economic return as well.
8. Yield increases from reducing row width of corn below 30 inches are more likely to occur in the southern Corn Belt than the central or northern Corn Belt.
9. Among Iowa, Illinois, Minnesota, and Nebraska; Illinois is the state with the greatest percentage of corn acreage grown in row widths less than 30 inches.
10. There is little economic benefit to growing corn in row widths less than 30 inches in the central Corn Belt.
11. Wheat is second only to soybean in the amount of acreage devoted to it worldwide.
12. Both wheat and corn yields have been rising in the U.S. because of improvements in genetics and management, but wheat yields have been increasing at a slower rate than corn yields.
13. The optimum growth temperature for wheat is about 15°C (59°F).
14. The U.S. is the number one wheat exporting country in the world.
15. The European Union is both a wheat importer and a wheat exporter.
16. High protein, hard texture wheat is more likely produced in the Great Plains than the southeastern U.S.
17. Sprout damage from rainfall at harvest time has generally been a greater problem in red wheats than white wheats.

18. The greatest acreage of oat in the U.S. is found in the Upper Midwest. This is also the area of the U.S. with the greatest yield potential.
19. Production of small grains can provide a hedge against weather, disease, insect outbreaks, and high-production costs in corn and soybean crops.
20. Having small grains in the cropping system can improve the distribution of labor and equipment over the calendar year when compared with growing only corn and soybean.

Section II. Please select the best choice. (30 points)

21. Which of the following is NOT a best management practice when planting corn early in the central Corn Belt?
- Plan to plant the poorest drained fields first.
 - Don't work soils that are too wet.
 - If you have a large acreage to plant, don't delay planting when favorable conditions exist before April 20.
 - Select a cold tolerant hybrid.
 - Use a seed protectant fungicide and insecticide.
22. Which of the following corn maturity management options results in the greatest spread in the silking and pollination period?
- Plant mid-season hybrids followed by full-season hybrids and early-season hybrids.
 - Plant full-season hybrids followed by mid-season and early-season hybrids.
 - Plant early-season hybrids followed by mid-season hybrids.
 - Plant mid-season hybrids followed by full-season hybrids.
 - Plant early-season hybrids followed by full-season hybrids.
23. Which of the following statements regarding corn-planting depth is NOT true?
- Depth of placement is most critical with early spring plantings.
 - The permanent root system will develop deeper in the soil with deeper seed placement.
 - Early planting has a similar effect on corn emergence as placing the seed deeply in the soil.
 - Corn should not be planted shallower than 1 inch deep in the soil.
 - All of the statements are true.
24. You planted a cornfield on May 3 and got a stand of 20,000 plants per acre. It is now May 26 and you are contemplating replanting the field. You've determined that you need a 15% increase in yield potential from the replanting to justify the cost. Use the following table to determine if you should replant the field.

Final Stand* (plants/A)	Planting Date				
	April 20 – May 5	May 13-19	May 26-June 1	June 10-16	June 24-28
	Relative yield potential (percent)				
28,000-32,000	100	99	90	68	52
24,000	94	93	85	64	49
20,000	81	80	73	55	42
16,000	74	73	67	50	38
12,000	68	67	61	46	35

*Assumes a uniform plant stand

Source: ISU Extension

- Yes, the field should be replanted.
- Don't bother, the replant will not cover the costs.

25. Which of the following statements about replanting or late planting of corn is NOT true?
- In the central Corn Belt, a hybrid with five-day earlier maturity than adapted should be used after May 25 and a ten-day earlier hybrid should be planted after June 1.
 - Planting corn after June 10 is risky unless it is used for silage.
 - Additional attention to weed management will be needed for poor stands that are not replanted.
 - Interseeding into existing plants is one of the best strategies for dealing with a poor corn stand.
 - A 10-20% increase in yield is generally needed to cover corn replanting costs.
26. You are planting in 20-inch row widths and calibrate your planter to drop 6 seeds per foot of row. During a test run you find that it is actually dropping 7 seeds per foot of row. If you do not change the settings on the drill, what will be your seeding rate in plants per acre?
- 182,952 seeds per acre
 - 174,240 seeds per acre
 - 139,392 seeds per acre
 - 148,562 seeds per acre
 - 163,618 seeds per acre
27. How many seeds per foot of row were planted if the row spacing was 30 inches and the seeds planted per acre were 33,000?
- 0.7
 - 2.6
 - 3.7
 - 1.3
 - 1.9
28. You are planting a corn field to a desired plant population of 31,000 plants per acre and assume a 5% seed and seedling mortality. What should your seeding rate be?
- 34,650
 - 33,800
 - 32,630
 - 32,550
 - 31,000
29. In which of the following states would corn producers use the lowest plant populations for non-irrigated production?
- Iowa
 - Illinois
 - Ohio
 - Minnesota
 - Nebraska
30. Which of the following does NOT occur as corn plant populations are increased above the optimum population for yield?
- Barrenness increases
 - Stalk strength decreases
 - Plant height increases
 - Average ear size decreases
 - Ear height decreases
31. Which of the following statements regarding corn stand density is NOT true?
- Prolific corn hybrids typically produce one ear at optimum populations for yield.
 - Prolific hybrids have less yield stability over a range of populations than do single-eared hybrids.
 - Relative to most other crops, corn has a limited ability for yield compensation to poor stands.
 - High corn populations are at risk for lodging.
 - All of the statements are true.

32. What is the corn yield (Bu/A) estimate from a 20-acre area with the following data? (Hint: Divide by 90)

Count	Number of ears in 1/1000 th of an acre	Average kernel rows per ear	Average kernels per row
1	30	16	30
2	28	15	32
3	29	17	28
4	31	16	31
5	28	15	33

- a. 158 Bu/A
b. 148 Bu/A
c. 138 Bu/A
d. 128 Bu/A
e. 118 Bu/A
33. What is the equidistant plant spacing for corn planted at 40,000 plants per acre?
a. 30 inches
b. 20 inches
c. 15.5 inches
d. 12.5 inches
e. 9.5 inches
34. Which of following inputs does NOT increase with economically justified increases in plant population?
a. Storage needs
b. Potassium and phosphorus fertilizer
c. Seed
d. Drying costs
e. All of the inputs listed will increase with increases in plant population
35. Which of the following is NOT true for a corn row width of 30 inches:
a. The most common row width in the northern Corn Belt.
b. The most common row width in Iowa.
c. The row width that producers in the central Corn Belt should be using for optimum economic return.
d. The equidistant plant spacing at populations commonly used today.
e. All of the statements are true.
36. Which of the following situations is most likely to give a yield response to narrowing of row width (Hint: Which one results in the smallest plants)?
a. Late-maturing corn planted early
b. Late-maturing corn planted late
c. Early-maturing corn planted late
d. Early-maturing corn planted early
e. All of the above would respond similarly to narrow rows
37. Which of the following statements concerning management of narrow row corn is NOT true?
a. Between-row cultivation is nearly impossible with row spacings narrower than 20 inches.
b. Narrow row corn production is more dependent on herbicides for weed control than wider-row production.
c. Narrow rows can decrease the application window for applying herbicides.
d. Narrow rows shade the soil earlier resulting in improved cultural weed control.
e. All of the statements are true.

38. When comparing 20-inch row spacing for corn with 30-inch, the average yield response for Iowa has been in the range of _____.
- 0-4%
 - 4-6%
 - 7-10%
 - 10-14%
 - 18-20%
39. You have been applying insecticide in the row at a rate of 6 lbs. per acre. The cost of the insecticide is \$1.50 per pound. You've decided to change your row width from 38 to 20 inches. What will be the added cost for the herbicide you have been banding when comparing the new and old row widths?
- \$8.10
 - \$9.00
 - \$12.15
 - \$13.50
 - \$16.25
40. Which three countries export more than 60% of the wheat they produce?
- Australia, Canada, and the U.S.
 - Argentina, Australia, and the U.S.
 - Argentina, Canada, and the U.S.
 - Argentina, Australia, and Canada
 - None of the above
41. Which of the following countries was NOT ranked in the top ten wheat importers for the period from 1999 to 2001?
- Egypt
 - Brazil
 - China
 - Japan
 - Iran
42. Which market class of U.S. wheat is grown primarily in North Dakota?
- hard red winter
 - soft red winter
 - hard white
 - soft white
 - durum
43. What two market classes of U.S. wheat are most often used to make bread?
- hard red spring, hard red winter
 - soft red winter, hard red winter
 - soft red winter, hard red spring
 - soft white, soft red winter
 - none of above
44. What is the correct ranking, from greatest to least, for price received for various wheat types?
- winter, durum, spring
 - spring, winter, durum
 - durum, winter, spring
 - durum, spring, winter
 - winter, spring, durum

45. The grain buyer at the Barilla plant in Ames purchases _____ wheat to make into pasta products.
- soft white
 - durum
 - hard red spring
 - hard red winter
 - soft red winter
46. What is the number one use of barley in the U.S.?
- Animal feed
 - Malt beverages
 - Breakfast cereal
 - Bread
 - Ethanol
47. What cool-season small grain has the protein level of wheat, much of the vigor and hardness of rye, and is a good substitute for corn in swine rations?
- oat
 - barley
 - foxtail millet
 - grain sorghum
 - triticale
48. Which of the following cool-season cereal grains is best adapted to higher rainfall climates?
- oat
 - barley
 - rye
 - wheat
 - triticale
49. Which of the following is considered the hardiest of all cereal grains because of its winter hardiness and productivity on infertile, sandy, or acid soils?
- barley
 - oat
 - grain sorghum
 - wheat
 - rye
50. Which of the following corn and soybean production problems could be better managed through lengthening the crop rotation with small grains?
- Soybean cyst nematode
 - Persistent summer annual weeds
 - Rising energy costs
 - Soil erosion
 - All of the above