

Agronomy 212 – Crop Growth, Management, and Productivity

Learning Objectives

Fall 2008

Final Exam

The final exam will contain 100 questions.

- Approximately forty (40) questions will cover the following topics presented over the past several weeks – grain quality, forage quality, cropping systems, and biofuels. Most of these questions will be developed from the list of learning objectives below and may include concepts presented via the journal papers assigned in class. Since the biofuels discussion will be given by guest lecturers, there will not be specific learning objectives listed; however, you are definitely accountable for their material on the final exam.
- Fifteen (15) questions will be calculation problems developed from the resource materials on the course web site. These questions will cover material from the entire semester.
- Approximately forty-five (45) questions will be based on questions asked on the first, second, and third exams. The questions will be rewritten to evaluate your knowledge of the underlying concepts.

Grain Quality

1. Describe the need for U.S. grain producers and marketers to be concerned with grain quality.
2. List examples of the following measurements of grain quality – defects, shipment and storage factors, and end-user factors.
3. Explain the creation and original purpose of U.S. grain standards.
4. Calculate the amount of two lots of grain needed to blend to given quality specifications.
5. Describe the intent of changes made to the U.S. Grades and Standards Act in 1986.
6. List and explain the changes needed for marketing grain value-added.
7. Describe incentives paid by large-volume and niche grain markets.
8. Define and describe a fatty acid.
9. Identify the five main fatty acids found in soybean and the number of carbon atoms and double bonds in each.
10. Define saturation and unsaturation of fatty acids and describe the importance of each to food use and health effects of soybean oil.
11. Describe hydrogenation and describe its importance to food use and health effects of soybean oil.
12. Explain the benefits of low linolenic soybeans to the food industry.
13. Describe the intrinsic qualities of corn and soybean by use.
14. Describe genetic alterations that improve the end-use qualities of corn and soybean.
15. Explain the acreage, incentives, growth, and locations for specialty corn markets.
16. List the advantages and disadvantages of high oil corn.
17. Describe the potential of low phytic acid and modified protein, oil, and starch for adding value to corn and soybean.
18. Explain the various specialty foods uses of soybean.
19. Characterize a value-added grain production and marketing system and the implications of such a system.
20. Explain the decision-making process used to assess the benefits and risks associated with producing specialty crops.

Forage Quality

1. List the recommended moisture contents for silage in different types of storage.
2. Characterize the ideal corn silage hybrid.
3. Describe the influence of harvest stage on the yield and quality of corn silage. Identify the optimum growth stage for harvest of corn silage.
4. Describe the importance of reducing mechanical losses to producing high yielding, high quality hay.
5. Characterize the appropriateness of different moisture contents for hay storage.
6. Describe cutting schedules used for alfalfa in the northern U.S. and their impact on yield and quality.

Cropping Systems

1. Identify the two main outcomes associated with cropping systems.
2. Quantitatively assess the yield benefits of growing corn and soybean in rotation with each other relative to growing either in monoculture.
3. Identify and describe problems with the corn/soybean rotation.
4. Define optimum yield and contrast it with maximum yield.
5. Characterize the role of interactions in determining optimum yields.
6. Describe the following interactions as they pertain to systems for optimum corn yield – planting date and plant population, planting date and nutrient level, nitrogen and plant population, nutrient level and hybrid, nitrogen and phosphorus, phosphorus and zinc, soil pH and phosphorus, nutrients and rainfall.
7. Explain the impact of conservation tillage on crop management factors.
8. Identify and describe the positive environmental impacts of optimizing yields.
9. Outline steps for implementing an optimum yield system.
10. Define precision agriculture and describe the benefits and drawbacks of precision agriculture.
11. List and describe agronomic factors that make precision agriculture useful.
12. Identify and describe the crop management components of a precision agriculture system.
13. Describe the use of the following technological components of precision agriculture - global positioning systems, geographical information systems, yield monitoring, and variable rate technology.
14. Outline steps for implementing a precision agriculture system.