

NAME: _____

SOILS 447/547
FERTILIZER TECHNOLOGY AND USE (447)
SOIL FERTILITY MANAGEMENT I (547)
SPRING 2008 – FINAL EXAM

Answer the questions completely. Show all your work. Work alone – this is not a group project. The answers to the questions below must be typed and submitted to me as a Microsoft WORD (or MAC WORD) document by May 5, 2008. Send your completed exam to: bmahler@uidaho.edu

Note: If you are enrolled in Soils 447 complete answers to the first 12 questions. If you are enrolled in Soils 547 complete answers to all 15 questions on this exam.

1. Compare and contrast the advantages of solid and gas forms of nitrogen fertilizers. (8 points)
2. Under what conditions would the use of suspension N-P-K fertilizers be more desirable than liquid N-P-K fertilizers in southern Idaho? (6 points)
3. Formulate 5 tons of 10-6-4-6 fertilizer using TSP, AN, AS, and KCl. Show all your work. (8 points)
4. Under what conditions would caking of fertilizers during storage be of concern in southern Idaho? Explain. (6 points)
5. Why is solid urea (45-0-0) less expensive than solid ammonium nitrate (34-0-0)? Explain. (6 points)
6. Fertigation is a very important method used in applying nitrogen to Idaho crops. Which is more efficient: applying nitrogen through furrow irrigation or applying nitrogen through sprinklers? Why? (8 points)
7. Explain the Table on the top of page 57 in your workbook (Application methods of nitrogen fertilizers and its impact on corn yields). Explain the probable reasons for the yield differences. (8 points)
8. Under what conditions would broadcast topdress applications of solid nitrogen fertilizers be preferable to solid nitrogen applications in a band below the seed (2 inches below the seed) at planting? (7 points)
9. Outline a long-term strategy (6 years) to deal with an iron deficiency in a soil with a pH of 7.8. The crop rotation is sweet corn/sugar beets/potatoes. (10 points)
10. Provide two practical reasons why the bulk density of fertilizers are important. (6 points)
11. Slow release fertilizers have been shown to increase nitrogen use efficiency by crops; however, widespread use has not occurred. What will it take to get more farmers interested in using these materials? (This is a philosophical question.) (7 points)

- 12. Design a wonder product (also known as “alternative product”) that you plan to sell both as a soil additive and a soil amendment. Come up with the name of your product, design a catchy slogan, and make 10 important claims about your product. (10 points)**

If you are enrolled in the 547 version of the course, answer the additional three questions below:

- 13. You are going to develop your own bulk blending fertilizer plant in south central Idaho. This plant can only have SIX basic solid fertilizer materials to make all the product you want to sell. What SIX basic fertilizer materials would you stock? Discuss and defend your answer. (12 points)**
- 14. What are the THREE most important physical properties of fertilizers? Why are these properties important? Discuss. (8 points)**
- 15. What are the pros and cons of using anhydrous ammonia compared to both solid and liquid sources of nitrogen? (10 points)**