NAME:_____

SOILS 446-03
SOIL AND PLANT DIAGNOSTICS
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

1. Describe in detail how you would take a soil sample from a uniform 20 acre field that you plan to seed to sweet corn. The field will be sprinkler irrigated. You are interested in having N, P, K, S, and Zn determined by a soil test. (14 points)

2. HOW and WHY should your soil sampling strategy differ from that provided in question #1 if your field was in continuous no-till? (6 points)

3. Describe conditions where each of the following soil sampling methods would be preferred in fields managed under reduced tillage conditions: (12 points)

   a. Controlled sampling
   b. Random sampling
   c. Systematic sampling

4. Under what conditions in southern Idaho would BCSR be a better method of soil test interpretation than SLAN? (7 points)

5. How can over-irrigation affect the critical nutrient concentrations and/or critical nutrient ranges in plant tissue? Discuss. (5 points)

6. Describe the types of conditions that would make it desirable to measure total nitrogen (organic N) in the soil. (6 points)

7. Design a 6-year diagnostic fertility program for land that will be planted into a peach orchard next month. The soil has a pH value of 7.9 and will be irrigated with sprinklers. Would you choose soil or plant diagnostics or both? Provide details and defend your answer. (12 points)

8. Which micronutrient soil tests would you have run on a soil which has a pH of 7.4, an organic matter content of 7.4%, and will be planted to sugar beets? Defend your answer. (10 points)

9. Under what conditions is plant tissue diagnosis desirable under dryland conditions? Explain. (6 points)

10. How would you use the soil and plant diagnosis information presented in this course to your advantage if you were starting an urban lawn care and landscape business. Explain. (8 points)

11. Why is current soil test correlation data for boron and sulfur poor compared to phosphorus, potassium, and zinc? (6 points)

12. What strategy would you use to prevent hidden hunger in potatoes during the growing season? Provide details. (8 points)