## Study Questions Exam 5

1. List three best management practices intended to reduce the loss of nutrients from agroecosystems.

2. Explain how buffer strips work.

3. List three benefits of cover crops.

4. Give a benefit and disadvantage of organic fertilizers compared to inorganic fertilizers.

5. To what do the three numbers of a fertilizer grade, X - Y - Z, refer?

6. The grade of a fertilizer is 12 - 12 - 12. How many lbs of N, P and K are in a ton (2000 lbs) of it? Atomic weights of P = 31 g / mole, K = 39 g / mole and O = 16 g / mole (or use conversion factors if you remember these).

7. Explain the von Liebig concept of a limiting factor.

8. To what do the plant analysis terms, "hidden hunger" and "critical concentration," refer?

9. Why are multiple random samples taken in soil sampling?

10. You want to take soil samples from a 80 acre field. Propose two different cases (combinations of different soils, previous cropping systems and / or fertilizer and lime programs) that would require you to submit samples from 6 different subareas.

11. List three general ways in which fertilizer is applied. Give a situation in which each would be the rational choice.

12. Timing of fertilizer application is important. Do the below suggestions make sense? Why or why not?

To supply N, apply organic fertilizer well ahead of planting.
Split application of N -starter and later second application.

13. The likelihood of a profitable response to fertilizer amendment is greatest if soil test levels are very low, low, medium, high or very high?

14. Why is the most economical rate of fertilizer application somewhat less than the rate required for maximum growth and yield?

15. Water erosion occurs because soil particles are detached, then transported. What causes detachment? What is the transport agent?

16. List the three types of water erosion. Which are most damaging?

17. List the factors controlling water erosion.

18. How do conservation tillage and cover crops limit soil erosion?

19. What are three water erosion control practices? How does each work?

20. Where is wind erosion typically a problem?

21. List the three types of wind erosion?

22. List the factors controlling wind erosion.

23. Which three of the above are subject management?

24. Erosion can destroy the productivity of soils and spoil water quality. So, too, can chemical pollution. Name a few soil pollution problems.

25. When an organic contaminant is released into soil all of it does not stay there forever. What can happen to it? Specifically, list and describe those processes controlling its fate.

26. The half-life of organic contaminant A in a soil is 100 days. The half-life of organic contaminant B in the same soil is 200 days. Assuming dissipation only by degradation, what fraction of the initial amount of A and B would remain after 400 days in this soil?

27. A nasty mix of chemical A and chemical B are dumped on a field by an outlaw hazardous waste contractor. Contaminant A is strongly adsorbed onto soil colloids. Contaminant B is very weakly adsorbed. Both are very resistant to degradation. Three years later high concentrations of one of these chemicals is found in samples taken from a nearby shallow well. Which chemical is it and why?

28. You are an outlaw hazardous waste contractor and have the choice of dumping your foul cargo on a silty clay loam soil or on a sandy soil. Although you are an environmental outlaw, you have some scruples. Being a little concerned about off-site movement, you decide to dump on which soil?

29. What's the difference between bioaugmentation and biostimulation?

30. In selecting a species for phytoremediation of a soil contaminated with heavy metals, what general characteristics of the plant are necessary?