

Total Station  
Score

## 2009 Missouri Envirothon Soils Eco-station

1. Examine the A horizon in the soil pit. What is the soil textural modifier and soil texture of the soil sample? (5 points)

*Very gravelly Silt loam*

2. Examine soil samples B and C. Which sample contains the greatest percentage of clay size particles? (5 points)

**a. Soil Sample B**

b. Soil Sample C

c. Both soil samples contain the same percentage of clay particles.

d. Both soil samples contain clay size particles, but it is impossible to tell which soil sample contains more.

3. Examine soil samples A and C. Which sample has the greatest percentage of rock fragments that are 2-76 mm? (5 points)

**a. Soil Sample A**

b. Soil Sample C

c. Both soil samples contain the same percentage of fragments that fall within the correct size category.

4. Utilize the soil survey to determine the name and depth of the soil where the soils station is located (Sheet 23)? (5 points)

*Doniphon Series, very deep. Or >60 inches.*

*Will give 2 pts for Niangua Series, deep or 40-60 inches and Bardley Series, moderately deep or 20-40 inches or Lebanon Series, very deep > 60 inches*

5. Examine soil samples A, B and C. Which soil sample is most likely to be from an A horizon? (2 points)

a. Soil Sample A

b. Soil Sample B

**c. Soil Sample C**

d. None of the soil samples are likely to be from an A horizon.

6. Explain your reasoning behind your answer to Question #5? (3 points)

*More Organic matter is indicative of a surface horizon*

Page  
Total

7. Which soil contains the most clay, the A horizon in the soil pit or Soil Sample C? (5 points)

*Soil Sample C – C is a silty clay loam, the A horizon is silt loam*

8. Using the Soil Survey of Camden County, Missouri, what is the Land Capability Class of the soil mapping unit where the soils station is located? (3 points)

*Mapping Unit 20C, class IVe*

9. Use the soil survey to determine the classification of Geep series. (3 points)

*Very fine, mixed, mesic, typic Paleudalfs*

10. The notations listed on the Munsell Color Chart include which three variables? (2 points)

- a. Purity, Strength, Clarity
- b. Hue, Value, Chroma**
- c. Hue, Brightness, Contrast
- d. Texture, Contrast, Chroma
- e. None of the above

11. What is the dominant parent material present at this site? (2 points)

- a. Alluvium
- b. Loess
- c. Glacial Till
- d. Residuum - Colluvium**
- e. Eolian sand

Page  
Total

Soils  
Total

1. Which soil is located just below the Doniphan-Lebanon-Viraton soil association in the block diagrams provided? (5 points)

*Clarksville soils*

2. What is the site index for white oak on the soil in question #1 above? (3 points)

55

3. Surface water flow is an important variable in supplying water for tree growth. Which order of landform shapes best depicts the greatest amount of surface water runoff to the least amount?(2 points)

- a. Concave, Linear, Convex
- b. Convex, Linear, Concave**
- c. Linear, Concave, Convex
- d. Convex, Concave, Linear
- e. Concave, Convex, Linear

4. Landforms are distinct parts of the landscape that have characteristic shapes and are produced by natural geologic processes. Although there are many specific landforms, only six general landforms commonly occur in Missouri. They are

- a. Uplands**
- b. Foot slopes
- c. Alluvial plains
- d. Flood plains
- e. Stream terraces
- f. Sinkholes

Look every direction around the site, assess the general lay of the land, and then select the appropriate landform. (5 points)

1. During a rainfall, the water will: (4 points)

- a. filter through the soil
- b. runoff into the lake
- c. **all of the above**
- d. none of the above

2. Sinkholes are a karst feature predominating throughout the Ozarks. What is the primary cause of this phenomenon? (3 points)

*Dissolving of the limestone geology due to weathering and precipitation. Could give 1 pt. if they said precipitation, soil acidity, etc. Or up to 3 points if they gave two of the components of the answer. Ex. Geology of Ozarks as it weathers.*

3. Utilize the soil survey to determine if the soil mapping unit at the aquatics station is affected by a water table. Identify the map unit and explain your answer. (5 points)

*Mapping Unit 35B, Lebanon has a fragipan and a perched water table at 1-2 feet from November through May.*

4. What is the available water capacity of the surface soil horizon for mapping unit 16D Clarksville very cherty silt loam, 9-14 percent slopes. Answer should reflect unit of measurement. (3 points)

*.07 - .12 inches per inch*

1. Which of the following soil mapping units would have the greatest potential to provide shallow water (<2.0 feet) areas for wildlife? (4 points)

- a. 22E
- b. 31A
- c. **26**
- d. 14B

2. What is the wildlife habitat rating for mapping units 37B and 38 in relation to coniferous plants? (6 points)

*37B is Good, 38 is not rated*

3. How many of the soil series in Camden County are considered to have a very shallow depth classification? (3 points) What is the rating for woodland wildlife for soils that have a very shallow depth classification? (2 points)

*Only one, Knobby, very poor for woodland wildlife.*

Page  
Total

1. Soil land capability classes generally relate to the use and management of the soils for field crops. List the soil land capability subclasses and define each subclass. (8 points)



*e = main hazard is risk of erosion*

*w= water in or on the soil interferes with plant growth or cultivation*

*s = soil is limited mainly because it is shallow, drought or stony*

*c= soil is limited due to climate*

2. Each field, forest, or pasture has a unique soil food web with a particular proportion of bacteria, fungi, and other groups, and a particular level of complexity within each group of organisms. These differences are the result of soil, vegetation, and climate factors, as well as land management. What are two (2) observations, from studying the table below, you can make about web food structures of soil organisms? (2 points)

*The ratio of fungi to bacteria is characteristic to the type of system.*

*Grasslands and agricultural soils usually have bacterial-dominated food webs – that is, most biomass is in the form of bacteria.*

*Forests tend to have fungal-dominated food webs.*

*Organisms reflect their food source.*

*Management practices change food webs.*

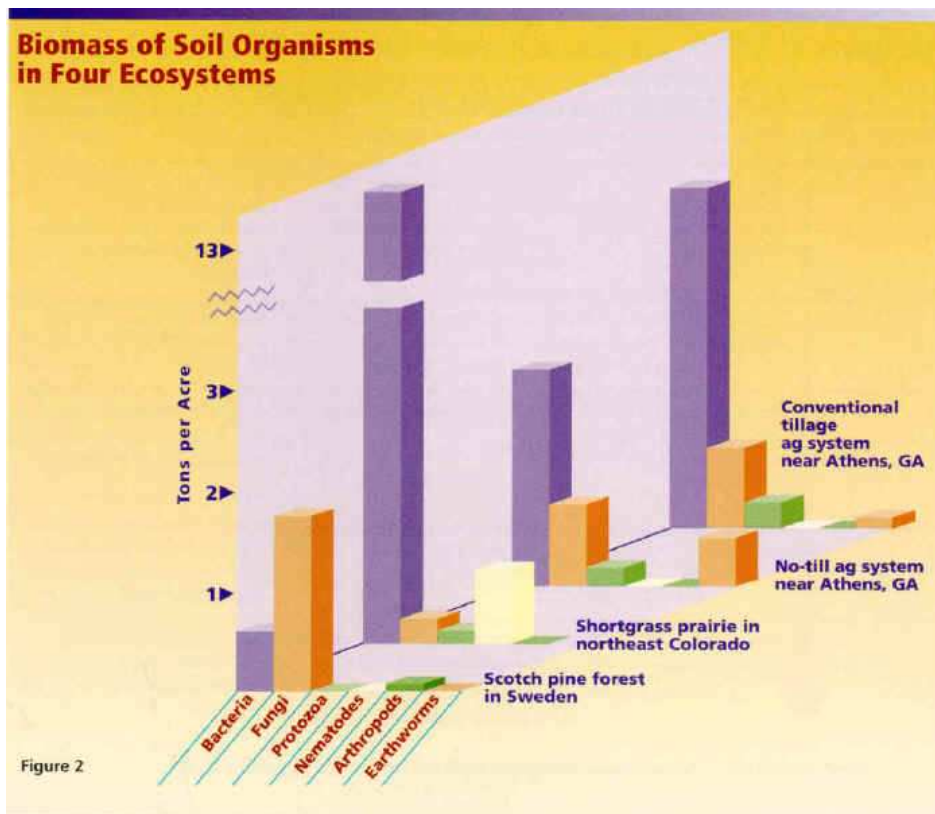


Figure 2



3. We know that temperature controls the rate of respiration and changes the amount of organic matter stored in soils. Based on your knowledge of respiration, would you expect to find more carbon stored in a cool or warm climate? Why? (3 points)
- a. Cool, because there is less sunlight available, which reduces the rate of photosynthesis
  - b. Cool, because microbes in the soil are less active as evidenced through lower rates of respiration**
  - c. Warm, because microbes in the soil have high rates of respiration, which releases more carbon in the soil
  - d. Warm, because sunlight is readily available, which means plants increase their rate of photosynthesis, leading to more carbon produced

4. Which of the following statements, best describes the soils found in an urban environment? (2 points)
- a. Soils are always natural in an urban environment, just like the soils in a rural environment
  - b. Soils are generally a combination of natural and disturbed soils in an urban environment**
  - c. The soils are always artificial in an urban environment
  - d. Urban soils do not have any organic matter in either the topsoil or the subsoil.