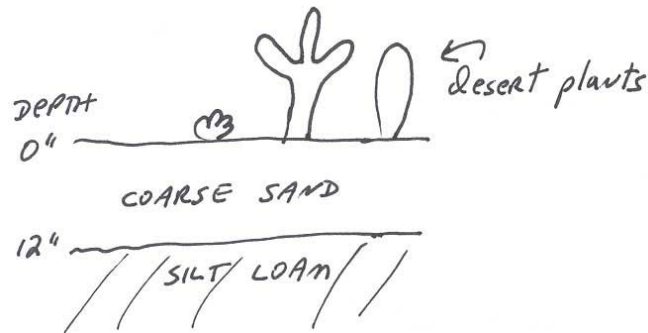


Name _____

AGRY 465 QUIZ
September 10, 2004
(30 points, 3 pages total)

- (3) 1. List the particle size limits for sand, silt, and clay in the USDA system for soil texture.
- (5) 2. Describe 3 ways in which soil aggregates can be formed.
- (4) 3. Of the 5 major assumptions used in Stoke's Law analysis of particle size distribution (texture) methods, which 2 assumptions are most likely to not be as good or correct? State those 2 assumptions and briefly explain the limitations of each of them.
- (4) 4. Describe 3 ways in which soils may vary in a field, and explain how this affects sampling or diagnostic strategies.

(6) 5.



A landscaping business was asked to build a "desert garden" for a client. The natural soil at the site was a silt loam, and they added about 12 inches of coarse sand on top of the intact silt loam, to provide a sandy rootzone for the desert plants. Now you are hired to measure the bulk density of the two different layers. For the sand layer, you want to know the density of the loosely-placed material (the landscapers did not compact the sand layer). For the silt loam layer, you want to know the density of the untilled soil, including some idea of macropore volume, since you are interested in how rapidly water can move through the natural pores and cracks in the soil. You have 3 standard bulk density methods to choose from: 1) intact cores, 2) excavation (sand funnel, rubber balloon, or plexiglas ring), or 3) clod.

a) Choose the one best method of measurement for the sandy layer, given the information above. Justify why you chose that method (i.e. convince me that this method is the best, for what you want to know.)

b) Choose the one best method of measurement for the silt loam layer, given the information above. (This might be the same method or a different method than for the sand layer). Justify why you chose that method.

- (8) 6. Given the following data, calculate:
- a) bulk density
 - b) total porosity
 - c) gravimetric water content
 - d) volumetric water content

SHOW ALL WORK AND UNITS!

core volume = 1200 cm^3
particle density = 2.65 g/cm^3
wet soil = 1800 g
dry soil = 1400 g
density of water = 1.0 g/cm^3