

# ENVIROTHON

## STUDENT SOILS TRAINING

### SOIL SURVEY BASICS

Originally, a book containing maps and text on soils in a particular area is now available digitally. Visit WebSoilSurvey at <http://websoilsurvey.nrcs.usda.gov/>

- I. Maps – aerial base with lines indicating differing soil units
- II. Piedmont vs. Atlantic Coastal Plain
  - A. Piedmont – northern New Castle County, soils formed from bedrock
  - B. Atlantic Coastal Plain – south from Newark through the Delmarva peninsula, soils formed from sediment deposits
- III. Soil Series
  - A. Soils that have a same profile (the surface texture may vary)
  - B. Named for a nearby place where the soil was first observed and mapped
  - C. Ex: Matapeake, Sassafra, Othello, Reybold, Elkton
  - D. Not all soils have a series = miscellaneous land type (ex: Udorthents, Urban Land)
  - E. Some soils are combined when too mixed to map = complex (ex: Glenelg-Wheaton-Urban land complex)
- IV. Soil Map Unit Name
  - A. Includes Series name, texture, and slope
  - B. See Map Unit Legend
  - C. Fallsington loam, 0-2% is a soil map unit and Fallsington sandy loam, 0-2% is another
  - D. Breakdown series into phases because of texture, slope, or stoniness differences (ex: FgA & FaA)
- V. Soil Map Unit Symbol
  - A. Abbreviated for use on maps
    1. First 2 letters are soil series name abbreviation
    2. Third letter is slope (may not have if there is only one soil phase)  
Coastal Plain Slopes: A=0-2%, B=2-5%, C=5-10%, D=10-15%, E>15%  
Piedmont Slopes: A=0-3%, B=3-8%, C=8-15%, D=15-25%, E=25-45%

3. Slope

a) Change in elevation, up or down, expressed as a percentage

b) Example: a point on the ground 100 feet away from where you are standing is 5 feet higher.  $\text{Slope} = \frac{\text{change in elevation}}{\text{distance}} \times 100 = \frac{5'}{100'} = 5\%$

VI. Soil Colors (see Munsell charts)

A. Page (5R...2.5YR....5Y....Gley) = Hue

B. Vertical = Value

C. Horizontal = Chroma

D. Notation = Hue value/chroma

E. Opposite page gives name of color

F. Example: 7.5YR5/6 = Reddish Yellow

VII. Landscape Position

A. See attached diagram

B. Upland, Upland depression or drainage way, Terrace, or Floodplain

VIII. Land Capability Class

A. Cropland and pasture uses

B. Number followed sometimes by a letter

C. The higher the number the more limited for use:

I No limiting factors, nearly level

II Gently sloping, or moderately well drained, or moderately deep

III Strongly sloping, or somewhat poorly drained, or shallow

IV Moderately steep, or poorly drained, or occasionally flooded

V Nearly level and very stony, rock outcrop, very poorly drained or frequently flooded

VI Steep, or gently sloping through steep with a very stony surface or rock outcrop

VII Very steep with or with out a very stony surface or rock outcrop, or very shallow soils

VIII Swamp, tidal marsh, costal beach, rock outcrop or urban land

D. Subclasses

e = risk of erosion

w = wetness

s = shallow, droughty, or stony

c = too cold or too dry

IX. Charts

Forest productivity; Crop yields for common crops grown; Prime Farmland; Available Water Capacity, and others

X. Site Suitability Questions

A. If you know the soil, charts list limitations for a use (septic tanks, homes with basements, streets... lawns). See page 6 in Sample Test.

B. If you do not know the soil and are working from a soil sample and previous questions: Start by circling an answer for each category (slope, depth to gray, texture...). The most severe item controls the suitability for a use. See page 5 in Sample Test.

XI. Definition of Prime Farmland

A. Land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses

B. Each state develops a list

C. Soils have adequate, dependable supply of moisture / favorable temperature and growing season / acceptable acidity or alkalinity, acceptable salt and sodium content, few or no rocks. / permeable to water and air / not excessively erodible or saturated with water for long periods / not frequently flooded during the growing season or is protected from flooding.

D. Soils with Capability Class I & II with no or few limiting factors

XII. Effective Rooting Depth is the same as the depth to bedrock

XIII. Hydric Soils

A. Gray within 10" of the surface

B. Very poorly drained and poorly drained soils

C. Support hydrophytic vegetation

XIV. Available Water Capacity (AWC)

A. Amount of water that a soil can store and release to plants

B. Calculated based on the top 40" of soil profile

C. Each horizon is calculated separately

D. Based on texture, calculate using the following:

Coarse (sand, loamy sand) = .05 inches H<sub>2</sub>O/inch of soil

Moderately Coarse (sandy loam, fine sandy loam) = .14 inches H<sub>2</sub>O/inch of soil

Medium (loam, sandy clay loam, silt loam) = .23 inches H<sub>2</sub>O/inch of soil

Fine (silty clay, sandy clay, clay) = .13 inches H<sub>2</sub>O/inch of soil

E. Determine AWC category from the following:

Very Low < 2.5 inches H<sub>2</sub>O in 40 inches of soil

Low 2.6 to 4.5 inches H<sub>2</sub>O in 40 inches of soil

Medium 4.6 to 7.0 inches H<sub>2</sub>O in 40 inches of soil

High > 7.0 inches H<sub>2</sub>O in 40 inches of soil