

READING GUIDE*

Soil Morphology II: Texture, Color, and Structure

Soil Survey Division Staff (1993), Chapter 3, p. 136-166 (p. 60-84)

OBJECTIVE: *To understand the morphological properties of texture, color, and structure as used when describing horizons within a soil profile, and to recognize the significance of these properties.*

Particle Size Distribution: Soil Separates, Soil Texture, and Rock Fragments

1. What are the three main soil separates of the fine earth fraction of the soil and the size limits of each?
2. Why is a field texture (e.g., determined using the feel method) considered an *apparent* texture? **Explain.**
3. How would a preponderance of each of the following influence the feel of a soil: (i) sand, (ii) silt, (iii) montmorillonite clay, and (iv) kaolinite clay?
4. How much organic carbon (C) is required to have an organic soil if the soil is never saturated? **How much organic C is required to have an organic soil if the soil is frequently saturated and has 20% clay?**
5. What is the difference between *muck*, *peat*, and *mucky peat*?
6. What is the definition of *rock fragments*? What are the various size and shape classes for rock fragments?
7. Why is it a challenge to generate rock fragment percentage estimates, especially in the field?
8. What are the rock fragment modifiers to soil texture classes and the limits of each? Are these based on weight or volume percentages?
9. With rock fragments at the surface, why are stones and boulders treated differently than smaller fragments?

Soil Color

10. What is the “default” physical state of the sample when determining soil color? Why is moisture state an important consideration when determining soil color?
11. What are the meanings of *hue*, *value*, and *chroma* as used in the Munsell Color System? Which is darker, value = 2/ or value = 8/ ? Which is duller (grayer), chroma = /2 or chroma = /6?
12. What are the “standard” conditions for measuring soil color? Why are these important considerations?
13. What is the difference between *mottles* and *redoximorphic features*? What attributes are used in the description of mottles and redoximorphic features? What are the specific criteria used for each?

Soil Structure

14. What is the definition of a *structural unit*? What is the difference between *peds*, *clods*, and *fragments*?
15. What is *compound structure*? How does it related to *simple structure*?
16. What attributes are used in the description of soil structure? What are the specific criteria used for each?
17. Is structure size determined by the largest or smallest dimension of the individual units?
18. How are structure grades (weak, moderate, strong) distinguished in the field? What soil properties influence structure grade? **Explain.**

SYNTHESIS:

19. What is the purpose of dividing soils into soil textural classes (instead of merely reporting sand, silt, and clay percentages)?
20. What is the purpose of describing the grade, size, and shape of soil structural units?

* Questions in plain type represent basic facts and concepts. Questions in **bold** type are those that are answered in the text but require more careful consideration. The Synthesis questions at the end help you apply the facts and concepts to a relevant issue.