Determining Soil Uniformity With Depth

Field and Lab Guide

Task

Determine whether the soil particle density and texture are uniform at 10 cm, 30 cm, 60 cm, and 90 cm depths

What You Need

- ❑ Soil auger
- ❑ Meter stick
- ❑ Four soil containers (bags or soil moisture sample cans)
- ❑ Materials for the *Soil Particle Density Protocol*
- ❑ Materials for the *Particle Size Distribution Protocol*
- ❑ Soil drying oven

A calibration curve for your soil moisture sensor at 30 cm depth must be developed for conversion from meter readings to soil water content. There is no need to develop calibration curves for other depths unless they differ significantly in soil particle density or texture. The following steps are how you determine this.

In the Field

1. Near the holes where your soil moisture sensors are installed, use the auger to take samples from 10 cm, 30 cm, 60 cm, and 90 cm depths and store them for lab analysis. Samples should be at least 200 g each. Labels should give the date and depth.
   Note: If you are using these samples for the *Gravimetric and Volumetric Soil Moisture Protocol*, follow the steps of that protocol for taking, storing, weighing, and drying the samples, and then, use the dry samples in the steps given below beginning with step 4.
2. Replace the remaining soil in the hole with soil from the deepest depth going in first and soil from near surface going in last.

In the Lab

3. Dry your soil samples.
4. Determine the soil particle density of each sample following the *Soil Particle Density Protocol*.
5. Determine the texture of each sample following the *Particle Size Distribution Protocol*.
6. Compare the particle densities at 10 cm, 60 cm, and 90 cm, with the value at 30 cm. If the value for a depth differs by more than 20% from the density at 30 cm, you should produce a separate calibration curve for that depth.
7. Locate the textures at the four depths on the *Soil Texture Triangle*. If the texture at 10 cm, 60 cm or 90 cm depth is not in the same area on the Triangle as the texture at 30 cm depth or if it is not in an area bordering the texture at 30 cm depth on the Triangle, produce a separate calibration curve for that depth.
8. You may wish to return your samples to the appropriate depths when you take samples for building your calibration curve.