Sampling & Preparing for Analysis

**Recommended diameter of soil core**
- Physical: 6 cm to 10 cm
- Chemical: 6 cm
- Biological: 2 cm to 6 cm
- Fine Roots: > 6 cm

**Depth of soil core**
- Typically between 5 cm and 20 cm
- For biological (5 cm) or chemical sampling (10 cm), try to keep within the A horizon. The cores should be 15 to 20 cm deep if you are interested in determining basic physical properties or near total nutrient pools.

**IMPORTANT** - Always carefully scrape away the organic horizon before you take a mineral soil sample. Become familiar with the differences between the Oe/a and A horizons.

**Procedure - Sampling**
- When sampling, it is important to have several (3 to 12) soil cores within a sample bag. This will account for natural variation found within the plot and minimize outliers. Also, you will have plenty of soil for analysis and archiving.

**Procedure - Preparing**
- It is important to completely homogenize soil samples prior to analysis. Any rocks, roots, or pieces of organic matter should be removed. Furthermore, large aggregates should be reduced in size to less than 2 mm in diameter. Soil should be passed through a 2 mm sieve.

Store at 4°C for biological activity or labile P analysis
- It is important to measure soil biological activity (e.g. mineralization & enzymes) and liable nutrients as soon as possible (within a week).

Air dry for basic physical (e.g. texture) or chemical analysis (e.g. total C, N, CEC, Exc. Al, etc.)
- To quickly air dry, place sieved soil in clearly labeled paper lunch bags in the forced-air oven with the fan on, but heater off (~45°C) for a few days. Shake at least once a day.

Because most report soil in units per kg of oven-dried soil, you must determine the moisture content of the soil. Weight around 10 to 20 g of fresh soil (or air-dry) on a tin weight boat and oven-dry at 105°C for at least 48 hrs. Find the ratio of oven-dried to fresh soil.
- You can also measure gravimetric water content (θg): θg = (g moist - g dry) / (g dry).
- With bulk density you can determine volumetric water content (θv): θv = θg * bulk density (g cm⁻³)