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Fundamentals of Soil Science

3.4.3. Calculation of Total Pore Space

... Substitution in the formula of 1.3 for bulk density and 2.6 for particle density gives 50 percent total pore space, which is considered rather typical for medium-textured plow layers. Using the same formula, the C horizon of the Miami (Figure 1) has only 32 percent total pore space. Soils research often requires an experimental determination of total pore space, as discussed in the next section.

3.4.4. Determination of Total Pore Space

The soil cores used for the determination of bulk density can also be used to determine total pore

space. To determine the pore space, the cores are placed in a pan of water until completely saturated and then the cores are weighed. The difference in weight between saturated and oven dry cores represents a volume of water equal to the volume of the pore space in the soil. For a 400 cubic centimeter core that contained 200 grams (200 cubic centimeters) of water at saturation, the total pore space of the soil would be 50 percent..

... Box 1 shows soil as a three-phase system.

References

Foth, H. D. 1978. Fundamentals of Soil Science. John Wiley & Sons, New York, USA

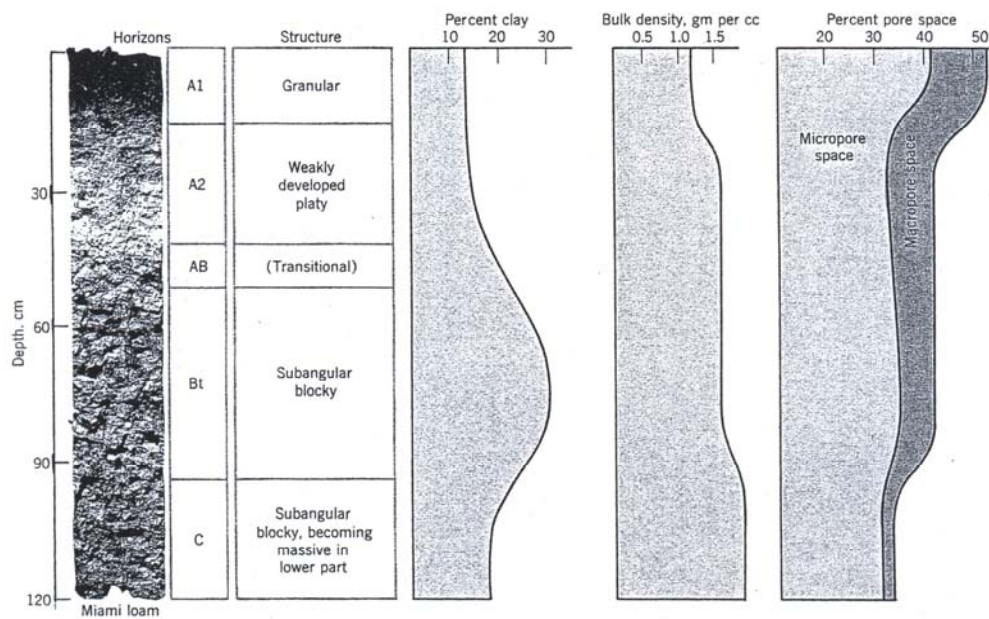


Figure 1 Horizon designations, structure, clay content, bulk density, and percentage pore space of horizons of Miami loam (Alfisol) (Source: Foth, 1978).

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<p>Box 1: Soil as a Three-Phase System</p>	<p>:</p>
<div> </div> <p>The soil volume occupied by solids, water and air is variable (Source: Foth, 1978).</p>	