

Project 2.1.7 Lab Report Template

Problem

I am going to look into the soil profile and try and determine the top soil and sub soil. It is important to understand what soil texture, soil structure type, and soil structure grades are when you want to figure something like this out. Soil texture is how the soil feels (how much sand, silt, and clay it has). Soil structure type is determining if it is blocky, granular, platy, etc. The soil structure type could also be massive. Soil structure grade is figuring out whether the porosity is well enough for the soil. I have to find out what the top soil and sub soil would look like, texture, structure grade, structure type, and course fragments. I also have to determine how much sand, silt, and or clay with layer of soil has.

Hypothesis

I think the top soil is going to mostly sand or silt with some clay due to it being moderate in permeability. The sub soil is probably going to be more of clay and some sand or silt because of the permeability being slow. I think that the top soil will have 40% sand, 30% silt, and 30% clay. The sub soil will have 20% sand, 30% silt, and 50% clay.

Materials

- Soil pit
- Pencil
- Computer with Word Processing
- Project 2.1.7 *Evaluation Rubric*
- Project 2.1.7 *Lab Report Template*

Procedures

1. Measure how long (in inches) the top soil is until the sub soil
2. Determine the color of the top soil and write what number corresponds to it
3. Feel the soil and write down what you think the texture of the top soil will be with a number in the data

4. Look at the soil and find out if the top soil has coarse fragments in it or not and write down the number
5. Try and determine what the structure type of the top soil is and write down the number
6. Figure out what the structure grade for the top soil is and write down the number
7. Get the horizon name for the top soil
8. Measure the sub soil (in inches) for how long it went down into the ground
9. Repeat steps 2-7 for the sub soil section

Data Collection

Table 1. Summary of Findings

| <p style="text-align: center;">Digital Photo of Soil Profile</p> | <p style="text-align: center;">Written summary of findings for each horizon as determined on the soil evaluation card</p> <p style="text-align: center;">Use a line to indicate horizon transitions</p> |
|---|---|
| | <p>First Horizon: The top soil went from 0-5 inches into the ground. The color was a light grayish and kind of a light brown but not much. It felt kind of smooth, but also a little gritty. The soil didn't have very many fragments of rock. The structure type looked blocky and the structure grade looked moderate.</p> <p>Second Horizon: The sub soil went from 5-8 inches into the ground. The color was more of a light brown with a slight hint of dark brown. It felt smooth and slightly rough. There were some fragments of rock in the soil. The structure type looked platy and the structure grade looked moderate as well.</p> |

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Table 2. Texture Determination of Soil Samples

| Your Findings | Class Average or Official Analysis | Explanation for Potential Differences |
|---|--|---|
| <p style="text-align: center;">First Horizon (0 to 5 inches)</p> <p style="text-align: center;">Color 4</p> <p style="text-align: center;">Texture 4</p> <p style="text-align: center;">Coarse Fragments 1</p> <p style="text-align: center;">Structure Type 3</p> <p style="text-align: center;">Structure Grade 3</p> <p style="text-align: center;">Horizon Name 2</p> | <p style="text-align: center;">First Horizon (0 to 8 inches)</p> <p style="text-align: center;">Color</p> <p style="text-align: center;">2 Texture</p> <p style="text-align: center;">1 Coarse Fragments</p> <p style="text-align: center;">2 Structure Type</p> <p style="text-align: center;">3 Structure Grade</p> <p style="text-align: center;">2 Horizon Name</p> | <p>The difference between mine and the official is that the horizon depth is a deeper in the official, the texture, and the structure type.</p> |
| <p style="text-align: center;">Second Horizon (5 to 8 inches)</p> <p style="text-align: center;">Color 2</p> <p style="text-align: center;">Texture 5</p> <p style="text-align: center;">Coarse Fragments 2</p> <p style="text-align: center;">Structure Type 2</p> <p style="text-align: center;">Structure Grade 3</p> <p style="text-align: center;">Horizon Name 4</p> | <p style="text-align: center;">Second Horizon (8 to 28 inches)</p> <p style="text-align: center;">Color</p> <p style="text-align: center;">5 Texture</p> <p style="text-align: center;">2 Coarse Fragments</p> <p style="text-align: center;">3 Structure Type</p> <p style="text-align: center;">3 Structure Grade</p> <p style="text-align: center;">4 Horizon Name</p> | <p>The difference between mine and the official is that the depth of the soil is deeper in the official and the structure type is also different.</p> |

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|---|---|--|
| <p>Third Horizon</p> <p>(___ to ___ inches)</p> <p>Color _____</p> <p>Texture _____</p> <p>Coarse Fragments _____</p> <p>Structure Type _____</p> <p>Structure Grade _____</p> <p>Horizon Name _____</p> | <p>Third Horizon</p> <p>(___ to ___ inches)</p> <p>Color _____</p> <p>Texture _____</p> <p>Coarse Fragments _____</p> <p>Structure Type _____</p> <p>Structure Grade _____</p> <p>Horizon Name _____</p> | |
| <p>Fourth Horizon</p> <p>(___ to ___ inches)</p> <p>Color _____</p> <p>Texture _____</p> <p>Coarse Fragments _____</p> <p>Structure Type _____</p> <p>Structure Grade _____</p> <p>Horizon Name _____</p> | <p>Fourth Horizon</p> <p>(___ to ___ inches)</p> <p>Color _____</p> <p>Texture _____</p> <p>Coarse Fragments _____</p> <p>Structure Type _____</p> <p>Structure Grade _____</p> <p>Horizon Name _____</p> | |

Analysis of Results

Throughout the experiment, the data that I collected was not very surprising. The soil all together was roughly a light grey and light/medium brown color. The texture was mostly smooth with the sub soil being a little rough due to the little pieces of fragmented rocks. I learned that there are different types of soil almost everything and that there are different layers instead of it all being the same. This is important because if there wasn't any type of layering in the soil, either the water wouldn't be able to get to the lower layers, or the water would run straight through and the soil won't be able to nourish it.

Conclusions

I was able to find out what the top soil and sub soil's texture, color, structure grade, structure type, and if it is fragmented or not with this experiment. For the most part, my prediction for what I thought the soil was going to be like was almost accurate with what I found. I put a different structure type and soil color as a prediction and found different information. I found that the color on the top soil was more of a light grey and the sub soil was a light brownish. The structure type of the top soil was blocky and the sub soil was platy. I think that the top soil was grittier and light colored because the sun puts more radiation on it so it is lighter, and the grittiness is due to the sand being in the soil.

Some errors that I found throughout the experiment was that the soil pit was full of water due to the sprinklers going off. Since the soil was wet due to the sprinklers, the soil could have been darker than what it originally was. The experiment could have gone better if the sprinklers didn't go off and the pit was dug right before we went out so the sprinklers couldn't get to it. We were able to find everything that we needed to finish and accomplish the purpose of this experiment.

It is important to have knowledge of soil texture and structure because it allows you to make predictions of the whole soil and determine what the soil needs to nourish the plant or whatever it may be living in the soil. It is okay to make errors in an experiment because it teaches you what you did wrong after it was done and how you can make it better. Texture and structure is important to the soil system because if soil didn't have them, it would not be able to be in different in climates and regions of the country or world. Texture allows the soil to have a different percentage of sand, silt, and or clay. The soil structure allows the permeability to be slow, fast, or at a steady pace and let the soil take in the water.