# LAB REPORT: Organic matter water holding capacity

Lab Partners:

Statement of the Problem:

* Organic matter in topsoil is thought to increase the amount of water that a given soil can absorb and hold. If soil is eroded or if organic matter isn’t replaced, it could lead to a decrease in the amount of water it can hold and the amount of water available to plants. Any water that cannot be absorbed and held by the soil will runoff into the water shed.
* When comparing two samples of soil – one with no organic matter and one with a high organic matter content – which will absorb and hold more water?
* Hypothesis:

Materials:

* Mass scale
* Plastic container (margarine or cottage cheese containers or other Tupperware containers work well)
* Subsoil with little or no organic matter
* Potting soil with a high amount of organic matter including peat moss, bark, and other composted vegetation
* Large measuring beakers. Beaker mouth should be larger than the base of the plastic container
* Popsicle sticks
* Drill
* Water

Procedure:

1. Fill a plastic container with a sample of 500 grams of subsoil with little to no organic matter.
2. Fill a plastic container with a sample of 250 grams of subsoil and mix in 250 grams of potting soil. Potting soil is made of things like peat moss and bark and will provide a high amount of organic matter.
3. Press both soils down into the containers to remove as much of the pore space as possible.
4. Drill or poke holes into the bottom of each container.
5. Set or hold the containers over two large beakers that can catch water. Use long popsicle sticks to create a suspension platform that will hold the container but still allow for water to drain.
6. Slowly pour 1,000 milliliters of water onto each soil sample. Let sit for 10 minutes.
7. Measure the amount of water that was collected in each beaker.
8. Record your observations. Take photos throughout to document the experiment.

Data and Results:

|  |  |
| --- | --- |
|  | **Amount of water** |
| **Subsoil sample** |  |
| **Subsoil sample with organic matter** |  |
| **Notes and other observations** |  |

Conclusions:

1. Which soil sample captured more water – with or without organic matter? Why?

Research Solutions: Conduct research to answer the following questions.

1. What are some procedures or methods that farmers and landowners can implement to protect soil from losing organic matter?
2. What are some procedures or methods that farmers and landowners can implement to help correct or improve soil that has lost organic matter?
3. How might soil organic matter impact biodiversity and populations in the soil ecosystem?

Report:

As a group, prepare a poster, PowerPoint, or other presentation to describe your experiment and your results to the rest of the class. Be prepared to make a 10-minute presentation and answer questions about your experiment and about organic matter’s ability to increase water holding capacity of soil.