

Soil and Water

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Wetlands and What They Do for Our Community



Flood Control

Wetlands function as natural sponges that trap and slowly release surface water, rain, snowmelt, groundwater, and flood waters. Trees, reed mats, and other wetland vegetation also slow the speed of flood waters and distribute them slower over the floodplain.



Wetland Dangers

Wetlands are truly amazing habitats, but they face many threats to their well-being. People have built roads, made housing developments, cleared, and burned parts of the fertile ground to farmland, even grazing livestock on the wetlands. On top of that, invasive species are taking over and slowly choking some wetlands. That is why conservationists are trying to save wetlands and keep them healthy.



Water Filtration

The primary way that wetlands filter water is through their roots in water flow. As water containing sediment passes through wetlands, the water flows slow. Sediment will drop out of the water and become part of the ground layer.



Wetland Animals

Wetlands provide homes for a variety of animals including beavers, otters, bobcats, deer, moles, muskrats, turtles, herons, salamanders, crayfish, mosquitoes, snails, dragonflies, crickets, grasshoppers, toads, and foxes.



Wetland Plants

Wetland plants help the habitat to hold onto water, which keeps local rivers and streams from flooding, and help prevent water erosion. Wetland plants include cattails, bulrushes, sphagnum moss, bald cypress, willow scrubbs, reeds, arrowwoods, and lily pads.



Problematic and Invasive Plants Include: Canada thistle, poison ivy, multiflora rose, and prairie reed.



Usually, Wetlands can naturally keep pace with changing water levels. In a process called accretion, plants trap sediment, which increases the elevation of the wetland's surface. For instance, Pike Lake wetlands in Kankakee County trap sediment and slowly push it into Pike Lake.



Detail: Arrowwoods and lily pads in the Pike Lake Wetlands.



Small Ian Martin
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Andrew Miller

Harrison Helpers

Soil

Moisture

Hypothesis: Sponges with the smaller pore space will have a higher field capacity and hold more water.

Introduction

Gravitational Force: Force that moves water downward through soil.

Capillary Force: Force that moves water in any direction through soil pores by adhesion and cohesion.

Saturated: Right after it rains, full amount of water soil holds.

Field Capacity: Max. amount of water soil can hold after gravity and capillary forces but before it air dries.

Plant Available Water: Water available to plants (water that is rung out of sponges in experiment).

Wilting Point: Point where soil has no plant available water (sponge after rung out in experiment).

Air Dry: Soil after prolonged drying or drought.

Experiment

Methods:

1. Soak sponges in bowl of water to find saturated weight.
2. Drain water off using gravity and weigh to find field capacity.
3. Squeeze sponge and weigh to find wilting point, the water rung out represents the plant available water.
4. Air dry for 3 days and weigh to represent drought.
5. Heat in microwaves for 30 seconds to remove all water. Weigh for a reference of what dry sponge weighs.

The best for holding water was the sponges with large pore size. The 2 made from plastic held the most. The one made from wood pulp held second best. The cellulose was the least effective in holding water.



Conclusion

This experiment applies to how the soil holds water. As a farmer, we can see the benefit to light tillage or some no-till to avoid more soil compaction. Also use of an aerator to put more air pockets in the soil will benefit plants because it will hold more water for them.



Description	Saturated wt.	Field capacity wt.	Wilting point wt.	Air dry wt.	Oven dry wt.
Plastic w/ large pores	192g	66g	34g	16g	12g
Wood pulp w/ large pores	164g	68g	30g	14g	10g
Cellulose w/ medium pores	190g	90g	30g	12g	8g
Plastic w/ small pores	518g	266g	38g	20g	18g



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Soil and Water Science Erosion



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