

Background

Farm lands and agricultural practices have a vital role in mitigating the harmful effects of Climate Change. The presence of organic content in soil affects soil structure, water quality and the nutrients in both media. Pasture management includes maintaining the soil nutrients to enable healthy plant growth, Pastures with an average pH of 6.6 is ideal for nutrient utilization to promote pasture growth and production (Mickel, 1994).

Purpose of the Study

The purpose of the study is to examine the pH level in the soil and water at the Fredon farm.

Variables

- Soil samples from three paddocks .
- Paddock 5 - Directly behind the pond
- Paddock 6 - In the middle of paddocks
- Paddock 8 - Farthest from pond

Measures

Two samples from each paddock were taken, and mixed together. Next the soil was filtered to remove organic matter, stones such that a fine soil mix remained. 50 ml of the soil was mixed with 250 ml of distilled water. The solution was stirred for 5 minutes. The soil solution was stored for 1 hour

Experimental Method

Materials Used:

1. Hula hoop
2. Shovel
3. Plastic bag to collect soil sample.
4. Soil samples(2 per paddock)
5. Measuring cup
6. Test strips
7. Comparator

Phase 1 -

1. Throw a hula-hoop in each paddock. Take a picture of the plants within the hula hoop. Next take a soil sample. Repeat in another area of the paddock.

Prepare the soil sample for testing:

Place soil samples into a clean container, sift the soil and remove organic matter and stones(small and large). To test pH, add soil to fill line and add distilled water to the to the water line. For Nitrogen, Potash and Phosphorus tests, add 250 ml to 50 ml of the soil, stir the mixture and let it stand for a minimum of 30 minutes.

Testing:

Select appropriate comparator for the test. Remove the cap, using the dropper provided fill the test and reference chambers to the fill mark with the solution from the soil sample. Remove appropriate colored capsules. Hold the capsule horizontally over the test chamber and pour the powder into the test chamber. Cap the comparator. Allow color to develop for 10 minutes. Compare the color of the solution in the test chamber to the color chart.

Water Test:

1. Fill the given test-tube with the water sample(soil mixture or pond water) using the given pipette.
2. Insert the 16 in 1 water testing strip into the test tube for 2 seconds and take it out.
3. Remove excess water and lay the strip horizontally for 30 seconds.
4. Using the color chart provided match the shade of the test strip to the appropriate color chart.

Phase II

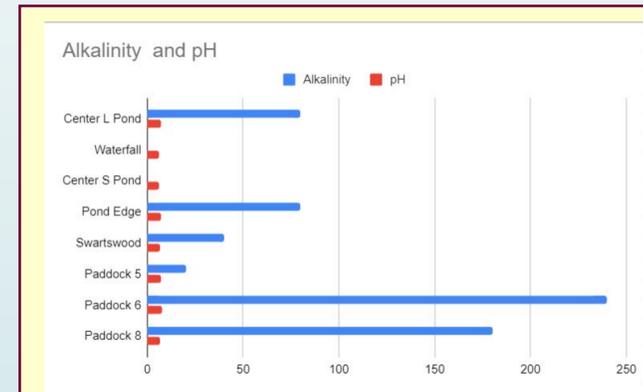
Take soil samples from the same paddocks after it rained(July 18th,22)and test for pH, Nitrogen, Phosphorus and Potassium.



Results

The pH of the areas were measured from 0-14. anything below 7 being acidic and anything above being alkaline. Therefore, 7 being neutral. The alkalinity was measured by milligrams per liter.

Result of pH and alkalinity levels



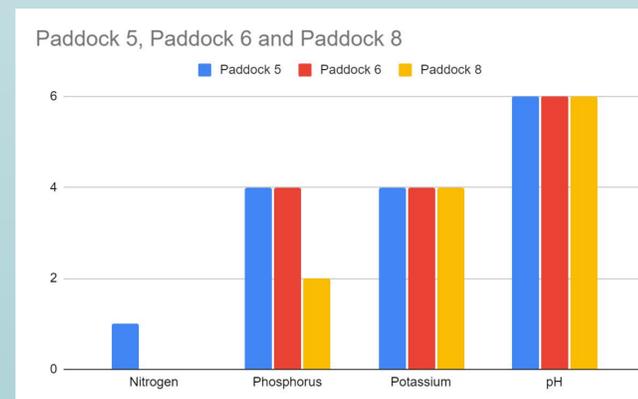
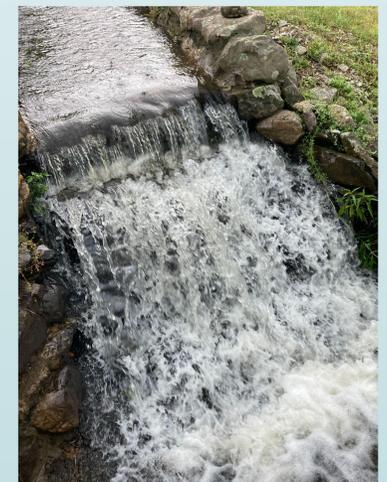
Fredon Pond: The pH levels from the soil mixture tests consistently show 6.

The pH levels from the pond samples are 7,6,6,7,7.3,7.5,6.5

Swartswood Lake pH levels from water samples show a pH level of 6.5.

An interesting correlation between the two results is that the pH and alkalinity levels from the Fredon pond and the 520 acre glacial lake were similar.

The ideal pH for foraging plants is between 6-6.9 and this makes the Fredon farm soil ideal for pasture.



Discussion

A healthy soil plot such as this means that the horses can live healthily and we are able to put healthy plants for sustainable equine living. The pH level is very healthy and the wildlife being supported in the farm. All of the plants recorded in our respective paddocks required a close to 7 pH. In brief words, the pH determines what plants can be grown in certain soil and in water determines what life can be sustained which in an equine environment means that the horses are eating good plants and the soil is being treated by the healthy water.

Rapitest Soil test

- The test uses a patented 4 chamber device called color comparators - one each for pH, Nitrogen, Phosphorus and Potash. The test involves comparing the color of the water tested to a color chart.
- pH scale - 7.5 Alkaline; 7.0 - neutral; 6.5 - slight acidic; 6.0 - acidic; 5.5 - acidic; 5.0 - very acidic; pH - very acid.
- N Test - N4- surplus; N3 - sufficient; N2 - adequate; N1 - Deficient; No - Depleted.
- P Test - P4 - surplus; P3 - sufficient; P2 - adequate; P1 - deficient; P0 - depleted
- K Test - K4 - surplus; K3 - sufficient; K2 - adequate; K1 - deficient; K0 -depleted

Water Quality test: Water test strips that tested 16 items - Total alkalinity, pH, hardness, Cyanuric acid, total chlorine, free chlorine, Bromine, Nitrate, Nitrite, Iron, Chromium, Lead, Copper, Mercury, Fluoride, and Carbonate root.

Testing conditions: Ambient temperature

Plant Etymology

Plants in the paddock are identified using Picture this(app).