Generating Water Characteristic Curves of Soils at OSU CBARC Moro and Pendleton

Sydney Cave

Objective

- Determine soil water characteristic curves, soil moisture release curves.

Main Research Questions

- What do water measurements mean for the plants (i.e. permanent wilting point, field capacity)?
- Establish baseline water release curves for the Pendleton and Moro REACCH sites.
- Establish lab protocol to develop water release curves using the Hyprop and WP4C.

Impacts of my Research

- This research can be applied to:
  - Farmers, Policy Makers, Ag. Industry folks etc.
- Why someone would care about this information:
  - Know appropriate watering
  - Know permanent wilting point on plots

Most Pertinent Literature

Schindler, U., W. Durner, G. Von Unold, and L. Müller. "Evaporation Method for Measuring Unsaturated Hydraulic Properties of Soils: Extending the Measurement Range." *Soil Science Society of America Journal* 74.4 (2010): 1071. Print.

Location

Pendleton

Long Term
Experiment

Location

Moro

Long Term
Experiment

Materials and Methods for Hyprop

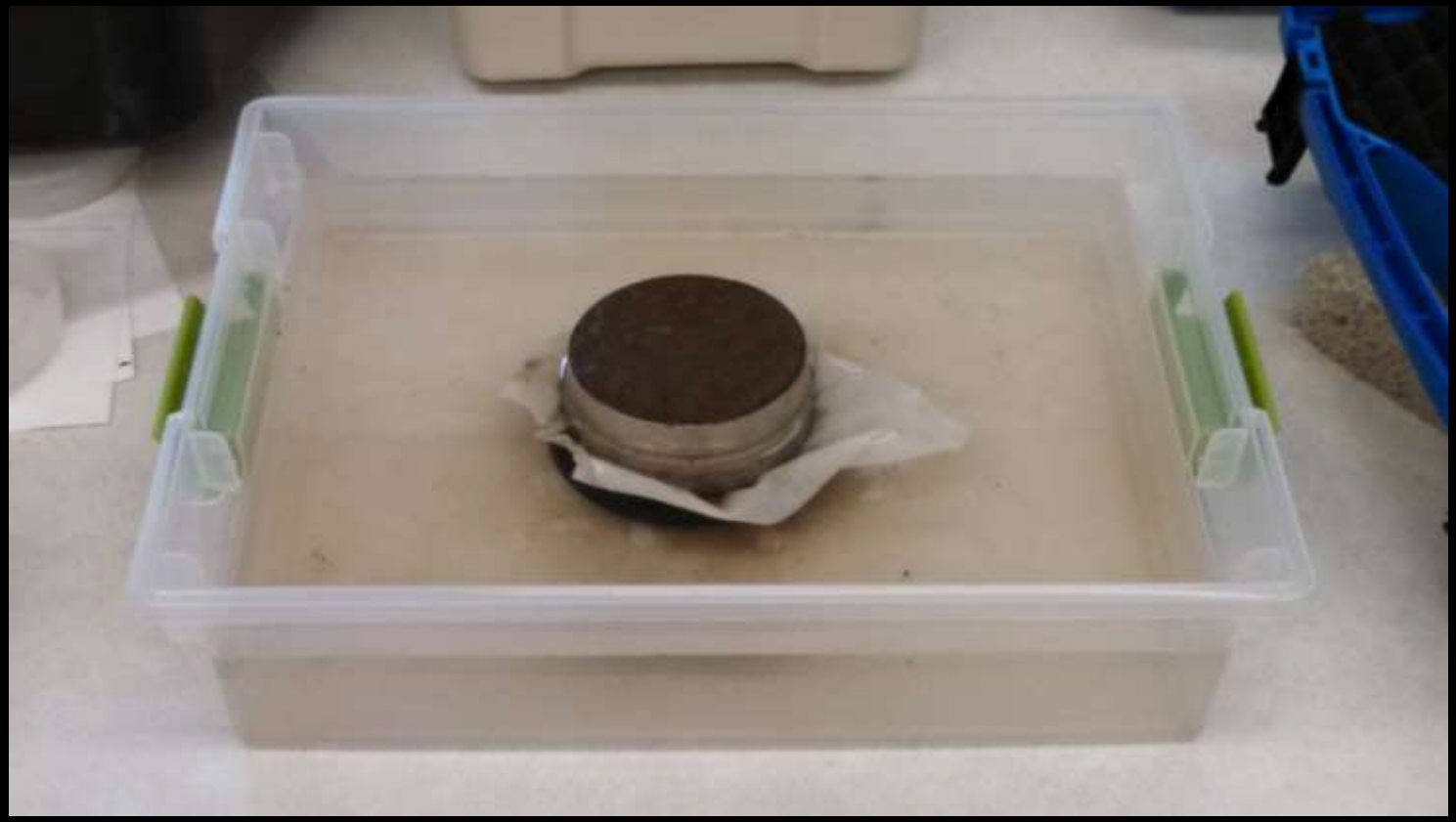
- Hyprop is used to measure water potential in the wet end.
- Uses two tensiometers to measure the water potential.

- Fill the sensor unit to start the degassing process.

- Gather a soil sample from a plot.




- Saturate the soil for 24 hours.

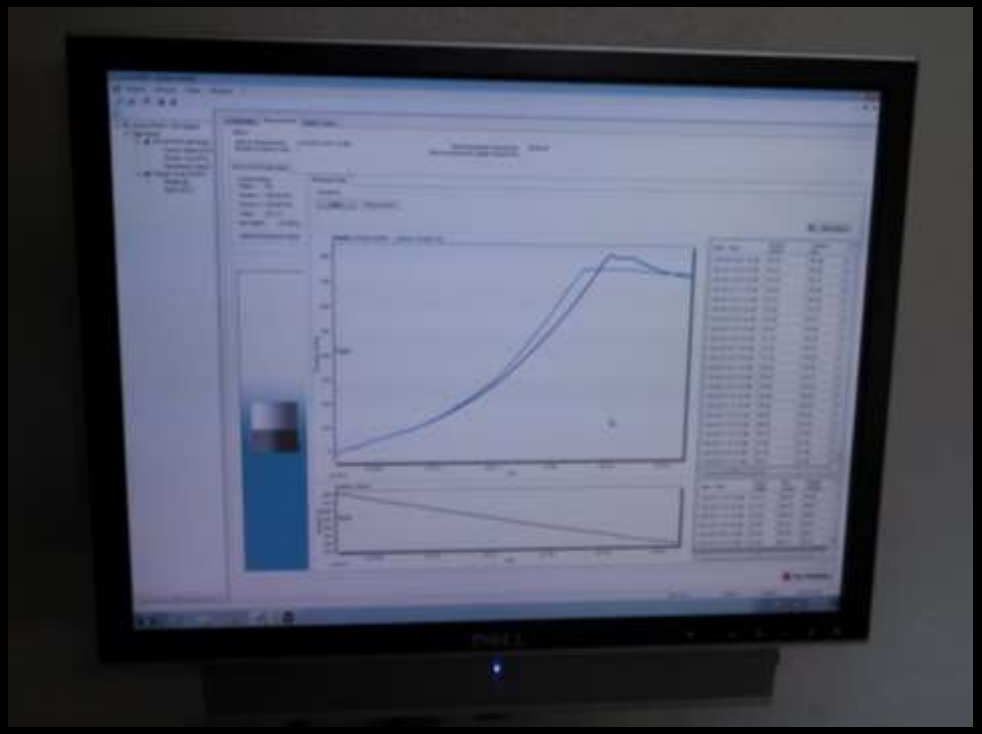


- Drill the holes in the soil sample for the tensiometers.




- Place the sample ring with the soil sample on the sensor unit.

- Place the soil sample on the balance and, with all the connections going to the computer, begin the campaign.



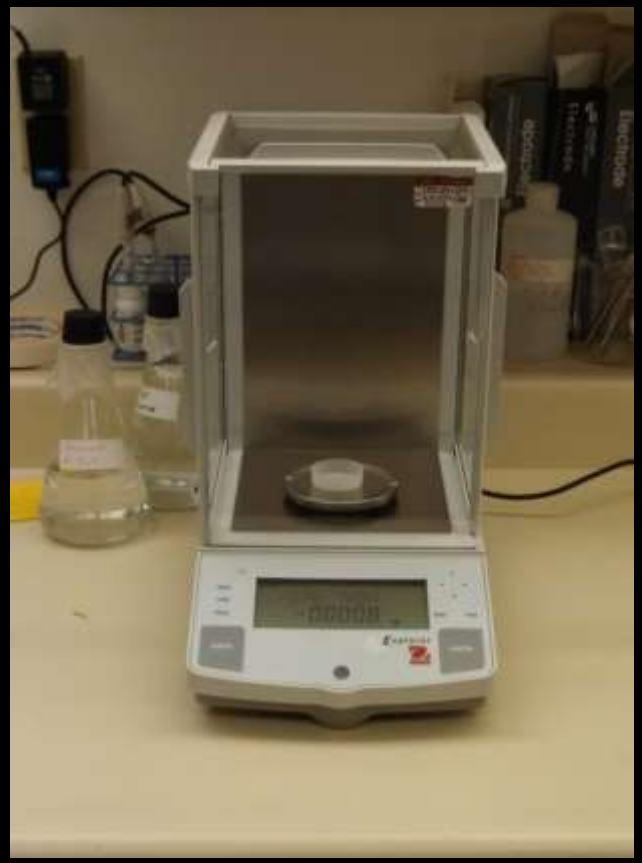
Method for WP4C

- Produces the points for the moisture characteristic curve in the dry range.

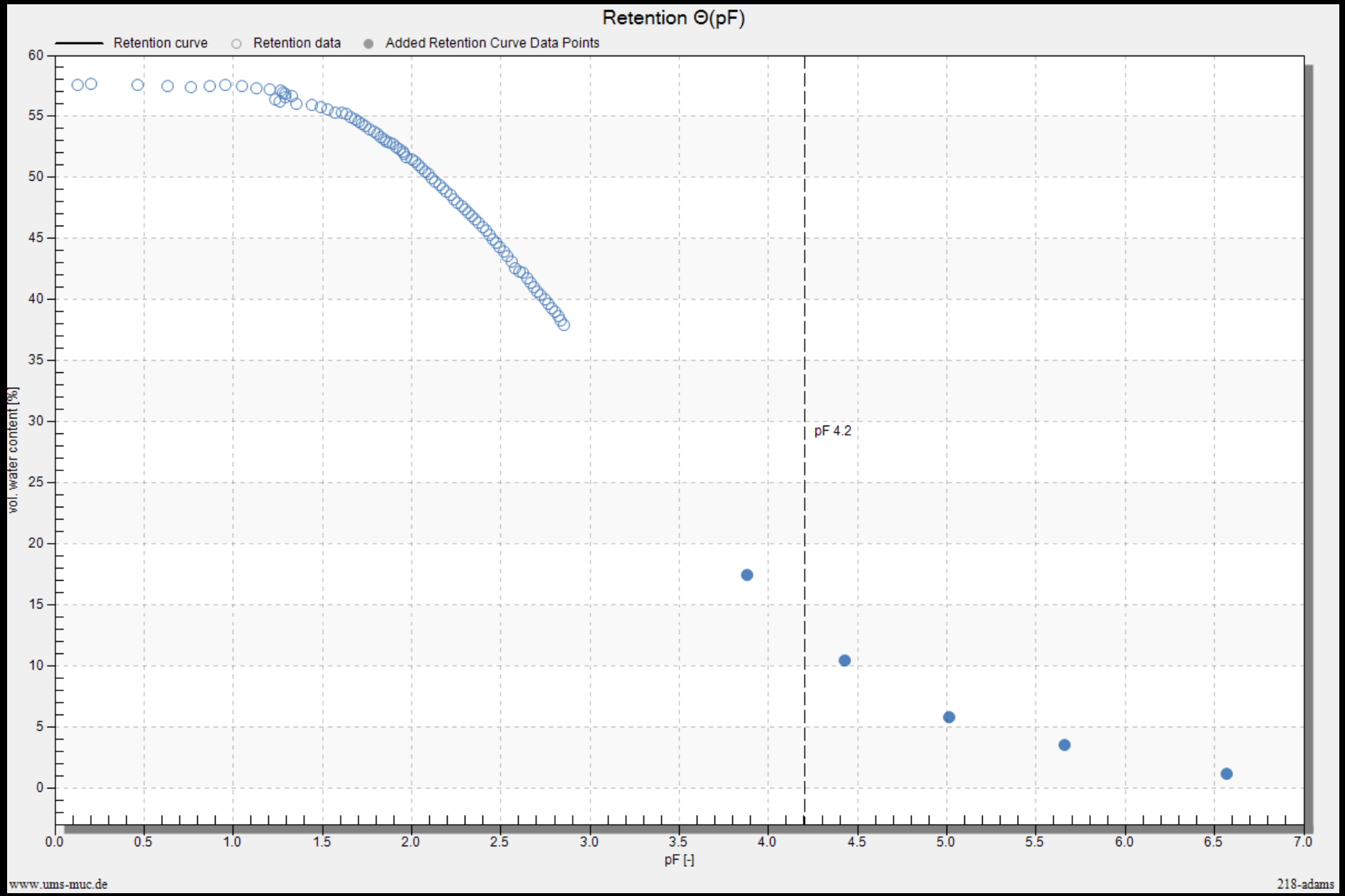
- Place the soil in the oven overnight.

- Put the soil through a 2 mm sieve and place back in the tin.

- Place 2.5 grams of the ground soil into a sample cup and then add moisture in the sample cups.



- Run the sample cups through the WP4C.


Retention Θ(pF)
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Pieces of Research

- Conclusion:
  - Being able to get a water release curve with the information from the Hyprop and WP4C in the LTE plots.
- Recommendations:
  - Vacuum pump.
- Limitations:
  - Time, lack of knowledge with machines.

Ethical Implications or Issues

- Ending the campaign early with the Hyprop.

Acknowledgements

- Dr. Stephen Machado
- Mr. Larry Pritchett
- REACCH Project
- Decagon Devices

References

Schindler, U., W. Durner, G. Von Unold, and L. Müller. "Evaporation Method for Measuring Unsaturated Hydraulic Properties of Soils: Extending the Measurement Range." *Soil Science Society of America Journal* 74.4 (2010): 1071. Print.

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