Water Infiltration Test

3 ring - 3 pour method

Theory: By pouring a premeasured ~450ml* of water into a 6 inch wide, 6 inch tall ring sunk half way into the ground we are able to approximate the effect of a 1" rain on the soil and observe how long it takes for the water to infiltrate into the soil. Second and third pours simulate 2" and 3" rains respectively and demonstrate how soil responds as water infiltrates deeper into the ground.

Practice: Water infiltration tests can be done anywhere there is an interest. Infiltration will change throughout the seasons and is strongly influenced by precipitation. Make sure to take note of recent weather conditions. Tillage will also alter results and should be noted. Once you've chosen your site:

- Lay out the rings across the site avoiding areas that have clearly been compacted such as track rows, compacted areas etc (or take note of how these areas infiltrate differently).
- Make sure each ring is on level ground and goes in straight.
- Do not disturb any thatch or plant material on the surface. If needed, use a sharp blade to slice around the ring through plant material to allow the ring to make contact with the soil.
- Place a piece of wood (2x4) over the ring (to protect the ring) and use a mallet to hammer it into the soil ~ 3" (it is useful to have the 3" line marked on each ring).
- Place the plastic liner in the ring and fill it with the pre-measured water.
- Gently remove the plastic liner, letting the water run into the ring and immediately begin timing.
- Once all the water has been absorbed (no shiny/glistening spots left on the soil) stop the timer and record the infiltration time. Repeat in all three rings for 3 consecutive pours.

Notes:

- Tillage will "fluff up" the top portion of the soil profile causing water to infiltrate rapidly on the first pour. Note how water infiltration may slow down on subsequent pours as water reaches the untilled soil.
- The plastic liner is used to prevent the act of pouring the water into the ring from eroding soil and affecting results. In high winds (where plastic is cumbersome) you can use your hand to break the impact of the water pour on the soil.
- When pounding in the ring, make sure that you are not disturbing the soil. If the soil is so hard that it is "bouncing" as you pound, make sure to note this and consider how it may affect your results.
- Avoid choosing areas with rocks or large roots. These will make pounding in the ring impossible and will also affect your results.
- Make sure not to disturb the area where you place the ring. Avoid stepping there and if you're using a penetrometer at the same time, make sure not to place the ring in a location where the penetrometer was inserted into the soil.
- If you're wondering if your infiltration rate is good or bad, compare it to a nearby unmanaged site with similar soil conditions. The unmanaged site will show the "natural potential" of a similar soil and give you a standard to aim for. The difference between your field and the unmanaged site can be interpreted to be the impact that management has had on the soil in your field.

* 463 ml for rings with an inside radius of 7.62 cm and 444 ml for rings with an inside radius of 7.45 cm