SOP for the Drain Pipe Method

Routine on-farm measurement of infiltration rates can help to improve agricultural land management, crop production and long-term soil development. The Drain Pipe method (DPM) is a quick, cheap, user-friendly and reliable technique for measuring infiltration on a range of different soil textures and organic matter contents.

Materials:

- Piece of drain pipe of 15 cm length and 16 cm diameter.
- Insulation tape.
- Ruller
- Bottle of tap water.
- Scrap wood block.
- Hammer or rubber mallet.
- Plastic bag or sponge
- Timer.
- Notebook

Methodology:

1. Prepare the cylinder attaching one piece of tape (A) around the outside of the pipe, with the lower edge of the tape 5 cm above the lower edge of the cylinder. A second piece of tape (B) is attached inside the cylinder, 5 cm down from the upper edge of the cylinder. Tape (B) should be visible when looking down into the cylinder. It is recommended that the lower edge of the cylinder is bevelled to help its insertion into the soil.

2. Using a hammer and block of wood, drive the ring to a depth of 5 cm into the soil (i.e. to the depth marked by tape (A). Insert the ring evenly and gently minimising soil disturbance.


3. Place a plastic bag or sponge in the bottom of ring and then fill the cylinder with water. Or pore the water carefully down the side of the ring so as not to disturb the soil. Fill the cylinder with water to the top edge.


4. Observe the water dropping in the cylinder until the water level reaches the upper part of tape (B). At this point start timing the rate of water fall.

5. When the level of the water drops to the lower edge of tape (B), stop the timer and record the measured time.

6. Once the time has been recorded, calculate the infiltration rate (mm hr^{-1}) by dividing width of tape (B; mm) by the recorded time (hr):

$$Infiltration = \frac{width\ of\ tape}{time}$$

7. To determine infiltration class, look-up the calculated infiltration rate determined in Step 6, in Table 1.

Table 1. *Infiltration rates and classes (adapted from the USDA Soil Quality Test Kit Guide information).*

Infiltration rate (mm hr^{-1})	Infiltration class
> 500	Very Rapid
500 - 150	Rapid
150 - 50	Moderately Rapid
50 - 15	Moderate
15 - 5	Moderately Slow
5 - 1.5	Slow
1.5 - 0.4	Very Slow
< 0.4	Impermeable

Photos: Tom Sizmur

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Esparcia AM (2014) Grower Science: On-farm method to measure the rate of water infiltration. Cranfield University, MSc thesis.