Sorptivity measurement by the Roger E Smith procedure
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These notes were produced after some field trials today.

1. Select the site to be assessed and carefully remove detached litter. Live plants near the inner ring perimeter could also be snipped off, so that tamping the soil is not compromised by plant stalks springing about.
2. Hammer the 10-cm ring in using the circular striking plate and a steel hammer, avoiding skewing the cylinder sideways and breaking any crust. Gentle but firm vertical strokes, holding the striking plate so that there is no bounce. About 5 cm insertion is OK, but is not critical: better to be deeper than shallower.
3. Very carefully repair any loose soil inside the ring with a small PVC tool with the same curvature as the ring. Preferred flow paths down the ring should be filled in this process. Bentonite sealing should not be needed if this is done carefully.
4. Measure out 78.5 ml of water and ready the stopwatch and data sheet. This volume of water ponds to exactly 1.0 cm and simplifies the calculations.
5. Pour the water rapidly into the ring and start the stop-watch at the same moment.
6. Watch carefully as the water level declines. Record all times in seconds. Record t_0 when the first patch of soil emerges above the surface of the water, t_m when 50% of the soil surface is just drained free of ponded water and record t_z at the moment the last water drains into the profile. Note that on very rough sites, the measurement criteria may not be met with the 10-cm ring, as the water may not cover 50% of the soil to begin with. In such cases, a smaller diameter ring, using a lesser but appropriate volume of water could be used, but be aware that as the diameter diminishes, the potential problems caused by ring edge effects increases.
7. **Calculation:** Sorptivity, S, is calculated by:- S = 1/sq root t_m, with dimensions of "centimetres per square root second". The higher the value of S the higher the initial soil uptake of rainfall in a "blotting paper" analogy. The sister assessment of steady state infiltration is used to examine the rate at which water flows through the profile.
8. An estimate of microtopography can be obtained by subtracting t_0 from t_z.

For the two examples we ran today, the values were as follows:-

Surface type	**t_0**	**t_m**	**t_z**	**s**
1. Bare crusted soil (image 1883)	140	183	220	**0.0739**
2. Grass seedling patch with sandy alluvium (image 1889, below)	0	60	78	**0.1291**

These are within the values reported by Smith, so can be regarded as “good” data.