

# Water needs to infiltrate soil

Where soils have been very dry, every drop of rain is welcome. But to have the most impact, the moisture needs to infiltrate the soil first - and good infiltration is not necessarily a given, said DeAnn Presley, Kansas State Research and Extension soil management specialist.

"Infiltration is the name of the game when talking about capturing moisture for crops or preventing runoff-induced erosion," she said.

Presley explained there are several factors that determine how fast a soil can absorb rainfall. These include:

- Length of time from the start of rain. Infiltration is usually high at first, decreasing gradually and eventually reaching a steady-state

of slow infiltration as the soil profile fills with moisture. No-till soils usually have a higher infiltration rate than tilled soils at the start of the rain event. But at steady-state, the infiltration rate of no-till soils is often the same as tilled soils.

- Water content of the soil when rainfall starts. Soils have a lower infiltration rate when they are wet than dry.

- Soil texture and structure. Soils with well-defined structure, stable aggregates, a large number of pores and higher organic matter content are best able to conduct water through the soil. The structural characteristics depend somewhat upon tillage. Tillage breaks down the soil structure and decreases ini-

tial infiltration rates throughout the soil profile. Raindrop impacts also break down aggregates. Soils that are not tilled gain some benefit from slightly higher levels of organic matter and from the much greater stability of aggregates.

- Condition of the soil surface. Large soil pores, such as old root channels or other cracks that extend from the surface well into the soil profile, allow for good moisture infiltration. Residue lying on the surface slows running water, giving water more time to infiltrate. Residue also protects the soil surface from the impact of falling raindrops. Partly buried residue that creates new flow paths into the soil also can aid infiltration. Each of these

features is characteristic of no-till soils.

- Depth and layering of the soil profile. The presence of different types of soil structure, texture and original parent material within the soil profile can affect the rate of infiltration. Tillage and heavy traffic on the soil also can change the profile by creating either a subsurface plowpan or a surface crust that will inhibit water movement. Surface crusts can be broken up with freezing and thawing, but plowpans are not. Plowpans may persist in soils for many years and are very difficult to address once present.

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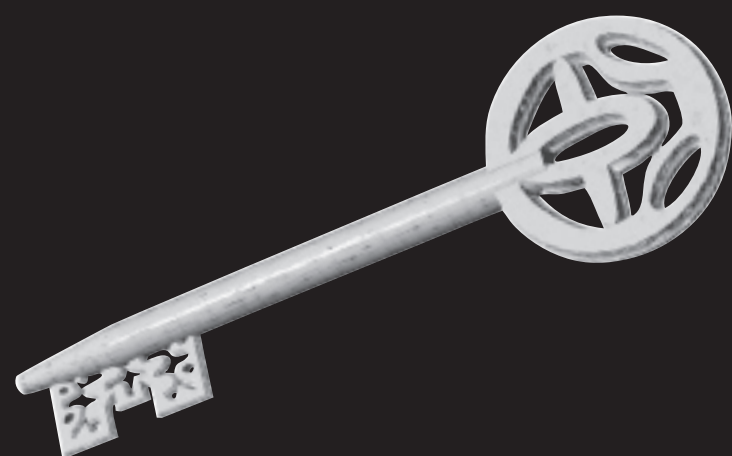


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