

Fragipan

A root-restrictive subsoil layer that is firm and brittle, but not cemented

Concept and Background Information

The [fragipan](#) is a root- and water-restrictive subsoil layer that is firm and brittle but not cemented. Air-dry fragments mostly slake in water, thus confirming the absence of a cementing agent. Fragments are firm or harder when dry. When moist, they have a brittle manner of failure when increasing pressure is applied (they rupture suddenly rather than deform gradually). The fragipan is commonly located below an argillic, cambic, or spodic horizon. It commonly has sufficient illuvial clay to also be an argillic horizon. Many fragipans have vertical ped surfaces coated with light-colored eluvial material that form a polygonal pattern when [viewed in cross-section](#) on a horizontal plane. The streaks commonly surround brittle, browner material that has redoximorphic features in the form of iron-manganese accumulations. Most fragipans restrict water movement, and water perches above them. Fragipans commonly form in transported parent materials. They are generally loamy in texture and commonly have a lithologic discontinuity.

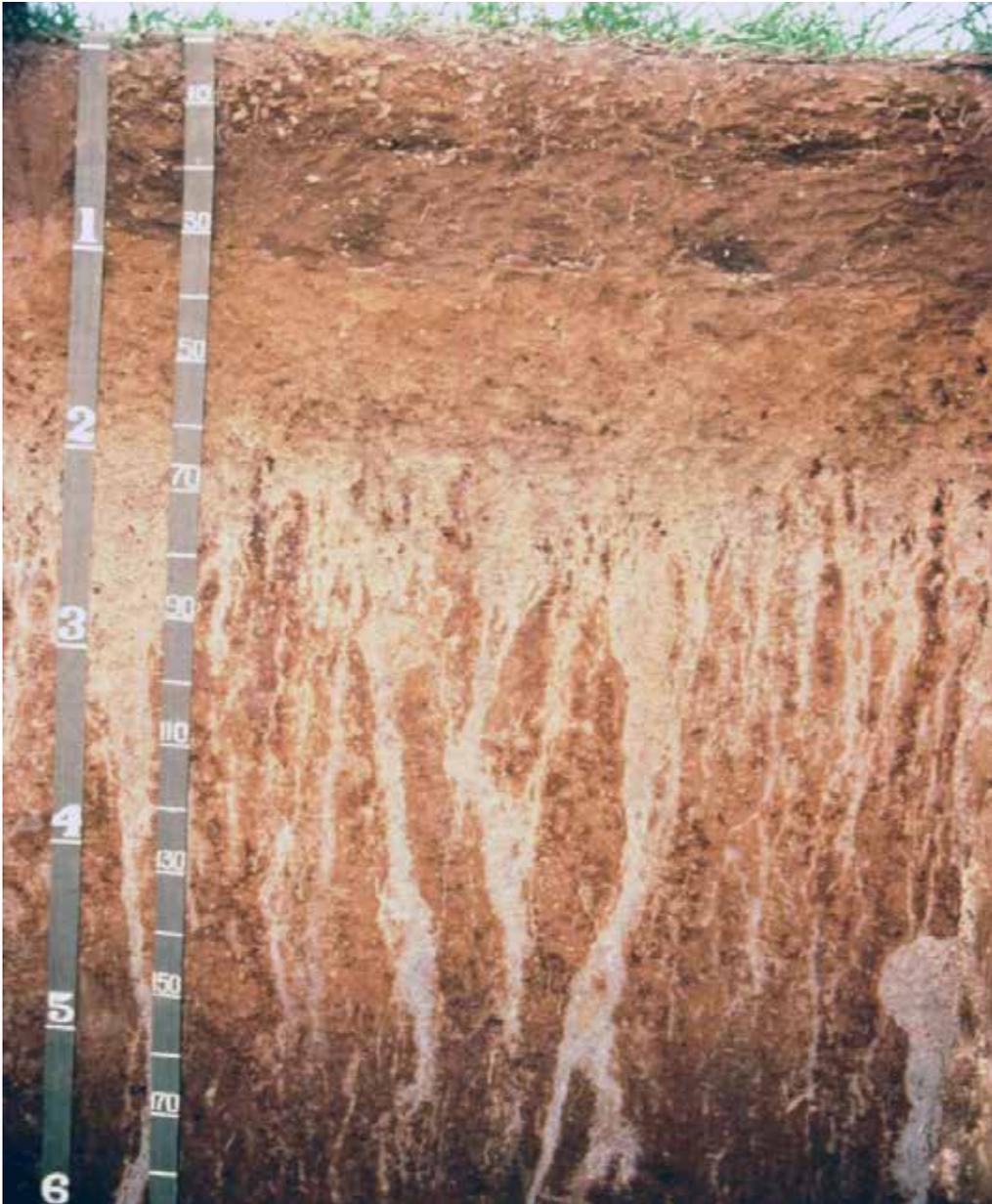
Generalized Characteristics

- 1) Thickness is ≥ 15 cm.
- 2) Layer has evidence of pedogenesis (e.g., it is not simply mechanically compacted).
- 3) Layer has structure that does not allow roots to penetrate at spaces less than 10 cm apart, or it is massive.
- 4) Layer is not cemented (air-dry fragments mostly disintegrate when submerged in water).
- 5) In $> 60\%$ of volume, peds are firm or hard and brittle when moist.
- 6) Layer is noneffervescent in dilute HCl.

Note: Evidence of pedogenesis includes features such as oriented clay, albic materials, structure, and redoximorphic features.

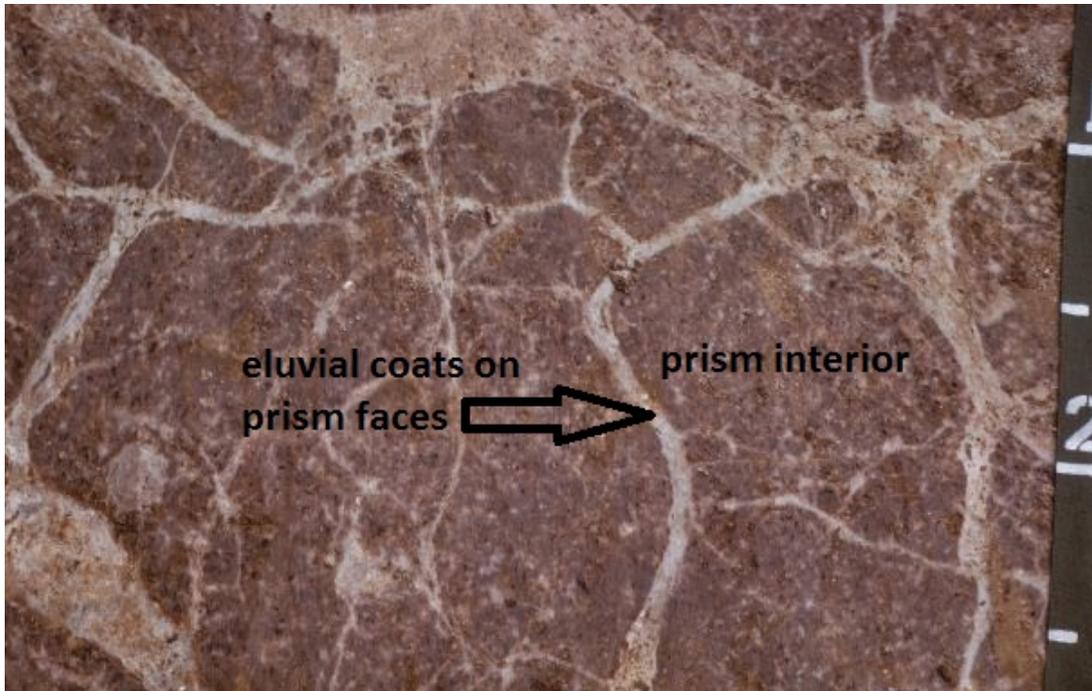
Common Horizon Nomenclature

Commonly used horizon nomenclature includes master horizon B, and less commonly E, combined with suffix x. Additional suffixes, such as g and t, may also be used. A number prefix denoting a lithologic discontinuity is often used for fragipans. Examples include: Ex, 2Btx, and Bxg.



Profile a Fragiudalf (in Tennessee) that has a fragipan below a depth of about 60 cm. The gray soil material consists of eluvial coatings surrounding the browner soil material of the prism interiors. Scale is in feet (left) and centimeters (right).

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Horizontal cross-section through a fragipan with prismatic structure. View is from above. Soil is a Fragiudalf in Tennessee. Scale is in feet.

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