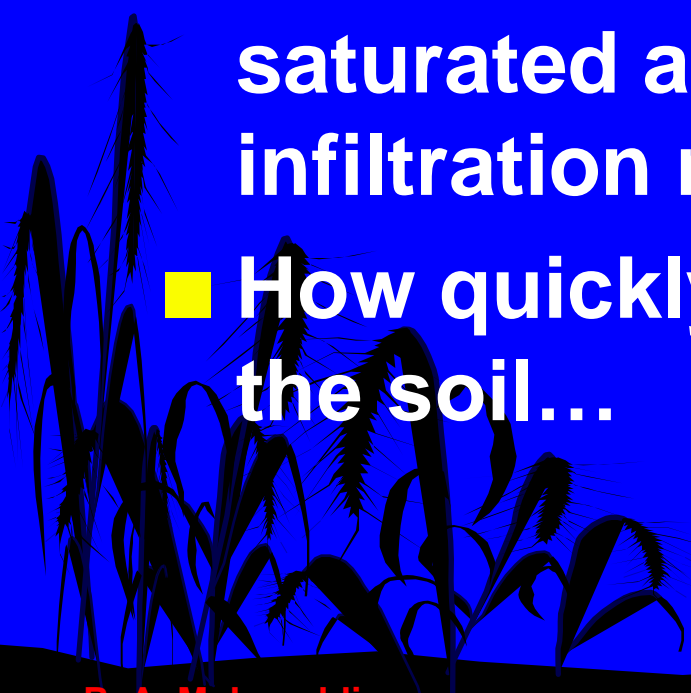
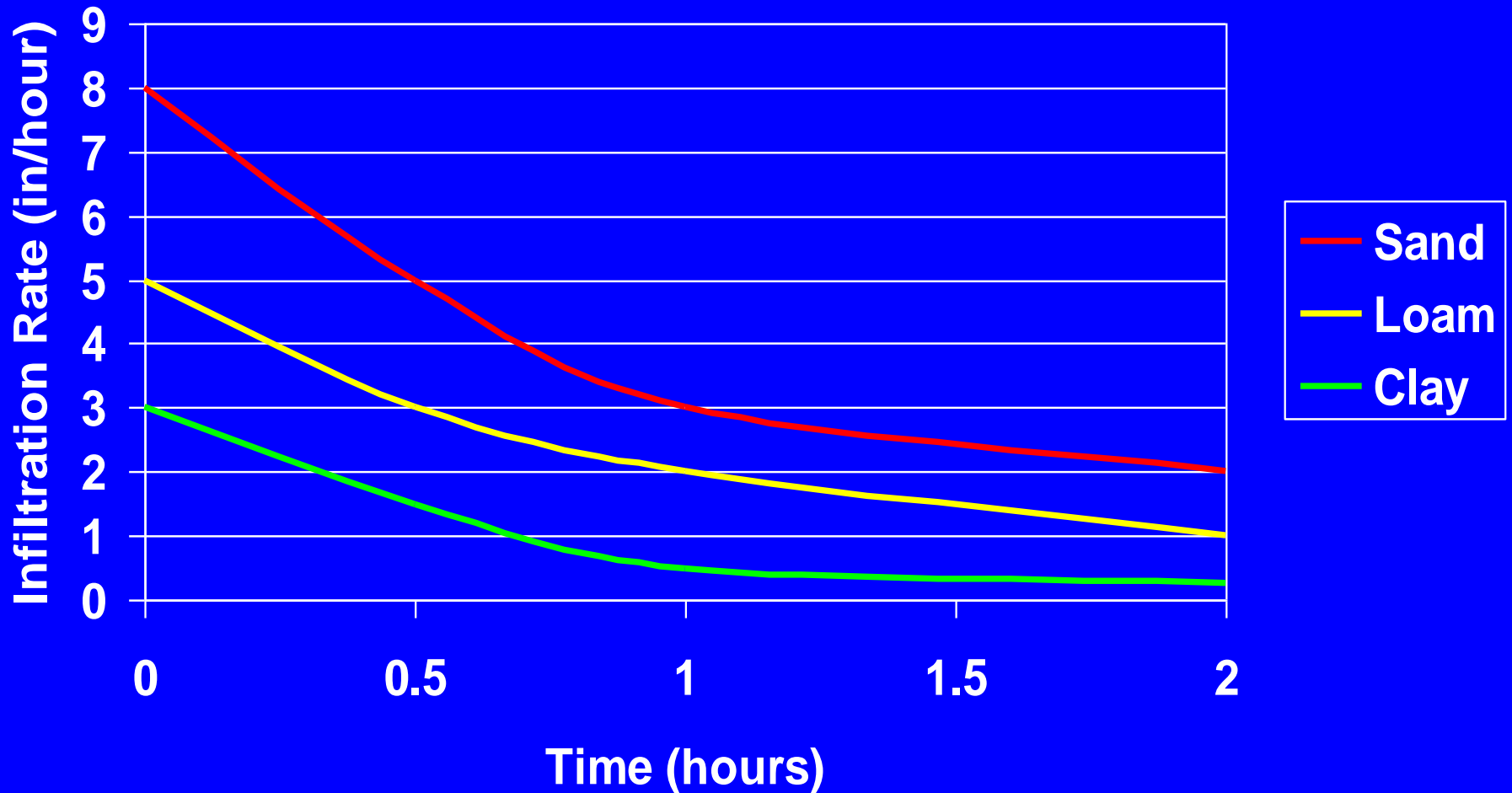


Saturated Soils Needed

- Water is initially drawn into soil by gravity and capillary forces.
- Runoff occurs once the soil is saturated and rainfall exceeds infiltration rates.
- How quickly this occurs depends on the soil...

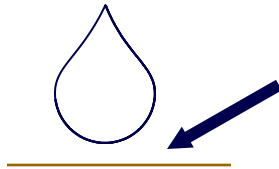


Soil Infiltration Rates Decline Over Time



Raindrops: The Start of Erosion

TIME: 0 sec 1/1400 1/150 1/70



Rain droplet falls on saturated soil.

Crater formed



Soil is displaced



Displaced soil is deposited



Slope Makes Big Difference

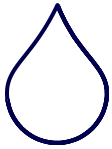
TIME:

0 sec

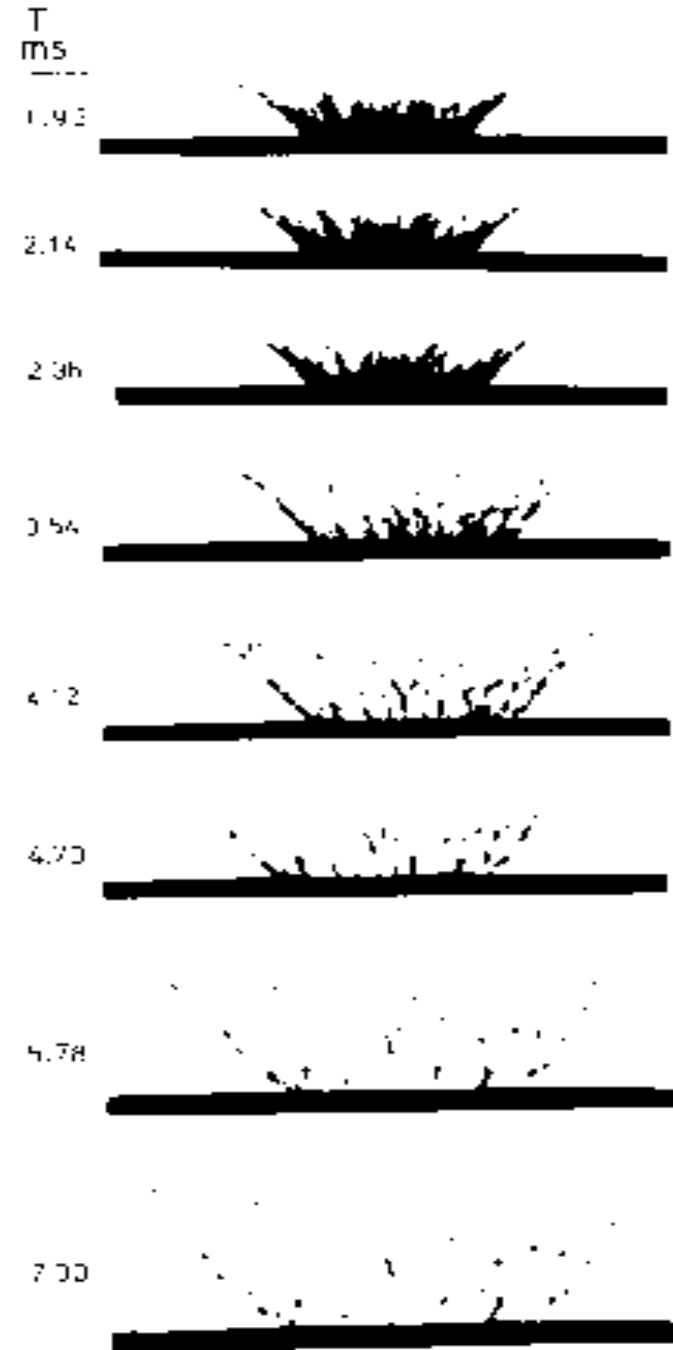
1/1400

1/150

1/70



Actual Droplet Splash on Saturated Soil



Splash Has Removed Fine Materials, Left Rocks



Surface Sealing and Crusting

- Rain droplets break down aggregates, sort the soil.
- Smallest particles form layer on surface.
- Infiltration rates decline **10X**, often after only one storm.
- A crust forms as the soil dries.

Soil Erodibility

All Soils Are Not Created Equal

- **Texture or Particle Size Distribution**
 - Silt is the most easily eroded component.
 - Clay tends to remain bound in the soil structure. Once caught up in runoff, it is very difficult to settle out.
 - Sand promotes infiltration, reducing runoff volume, and tends to settle quickly.
- **Organic Matter: increases infiltration so runoff volumes are lower.**

Soil Erodibility (cont.)

All Soils Are Not Created Equal

■ Structure

- Blocky, platy, or massive are less erodible than granular.

■ Permeability

- Rapid is less erodible than slow!

Creedmoor Sandy Loam

Sandy Loam

Sandy Clay Loam

Clay



R. A. McLaughlin

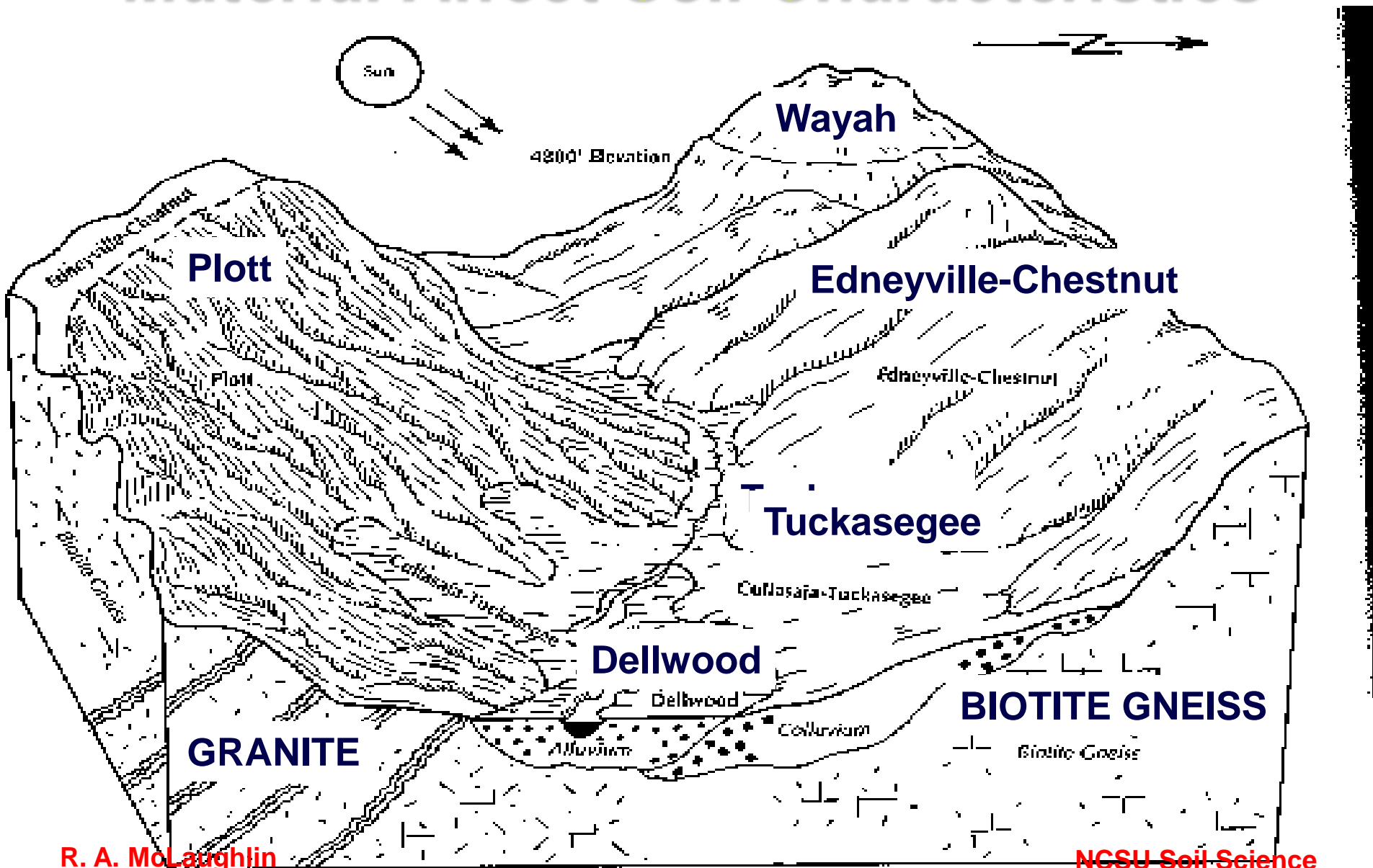


NCSU Soil Science

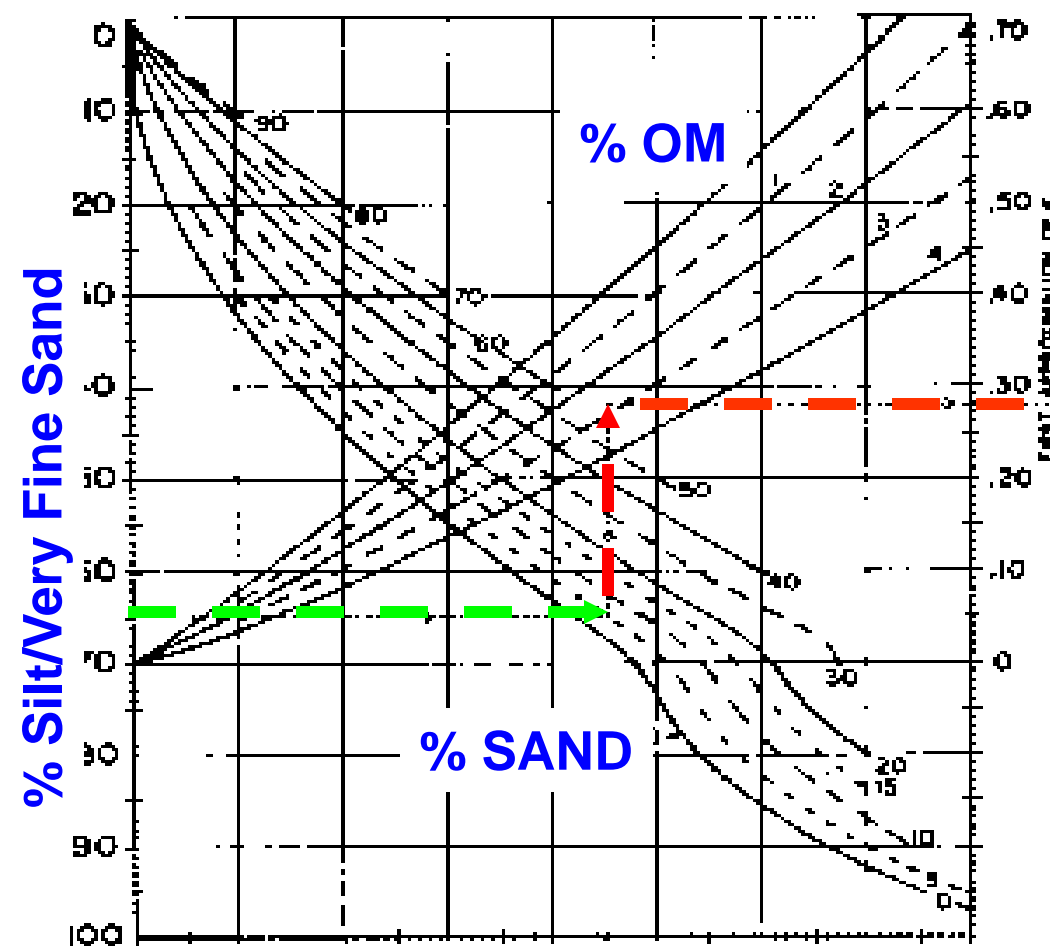
Erodibility Changes With Depth



Climate, Landscape Position and Parent Material Affect Soil Characteristics



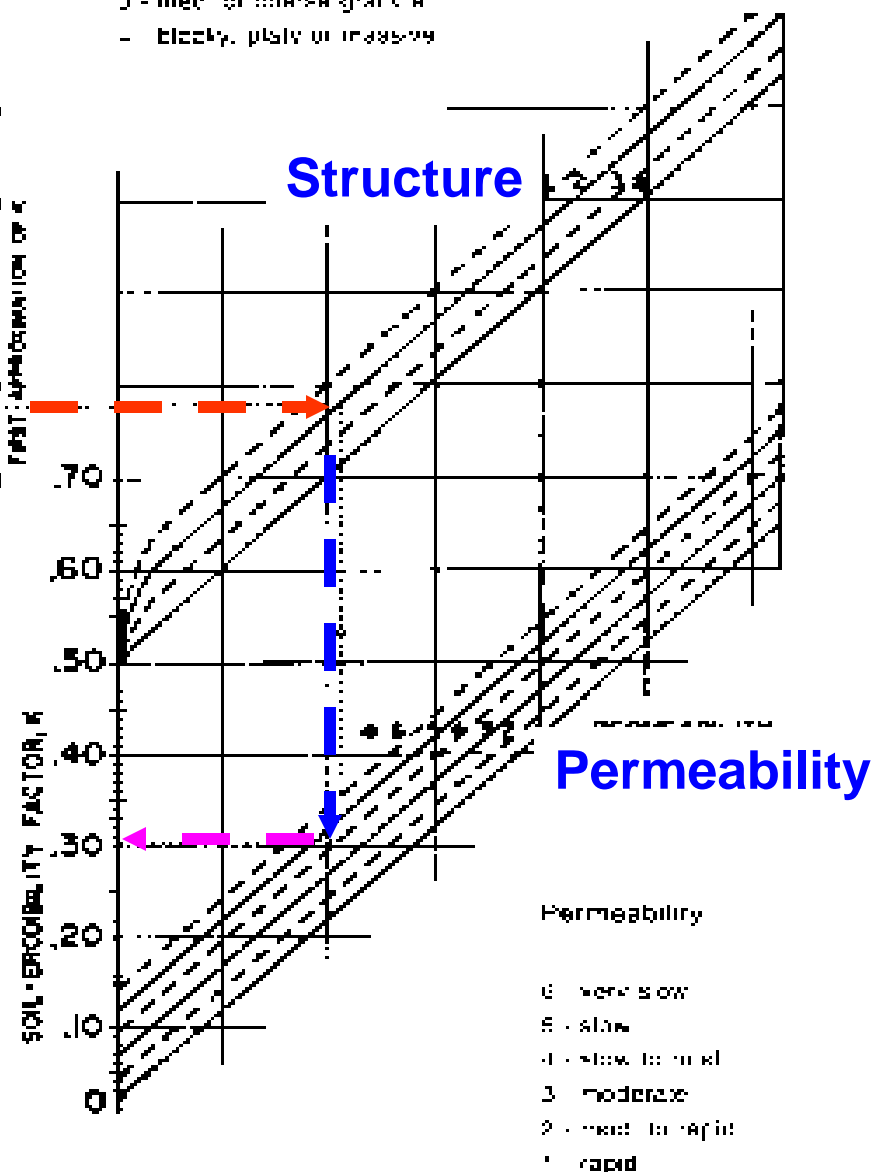
Soil Erodibility (K) Calculation



[Source: Agriculture Handbook Number 537]

Soil Structure

- 1 - very fine granular
- 2 - fine granular
- 3 - med. or coarse granular
- 4 - blocky, platy or massive



Permeability

- 5 - very slow
- 4 - slow
- 3 - slow to med
- 2 - moderate
- 1 - fast to rapid