

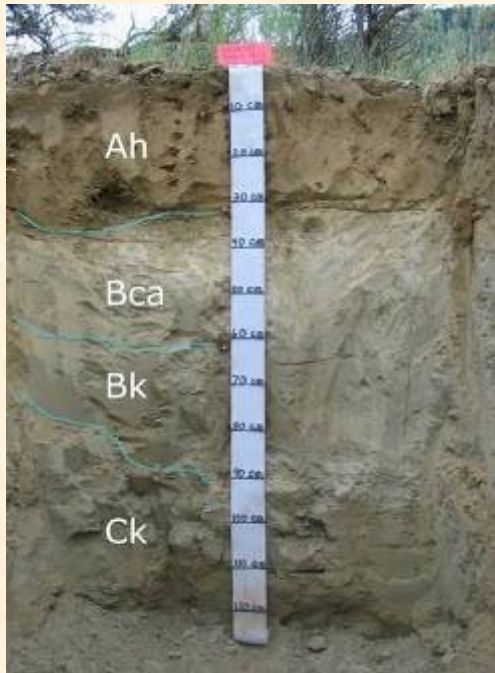
A pair of weathered, brown hands is shown from a top-down perspective, gently cupping a small, vibrant green seedling. The seedling has four leaves and is growing out of a mound of dark, rich soil. The background is a solid, deep black, which makes the hands and the plant stand out prominently. The lighting is soft, highlighting the texture of the skin and the moisture on the leaves.

Soils Primer...  
'soil in the city' – for  
PRSSS

*Geoff Hughes-Games, PAg*

# What is soil?

- Not dirt !
- It has value and should be treated as such.



**soil**: a mixture of living organisms (such as bacteria, fungi, plant roots), mineral particles, water, air, and dead organic matter; includes the entire mantle of unconsolidated material above bedrock; provides nutrients, moisture, and anchorage for land plants; acts as a control mechanism in an ecosystem

# Critical characteristics

- Physical
  - texture, coarse fragments, structure
- Chemical
  - pH, salts, organic matter (OM), nutrients
- Biological
  - Plants, roots, bacteria, fungi, “bugs”, “animals”, etc.



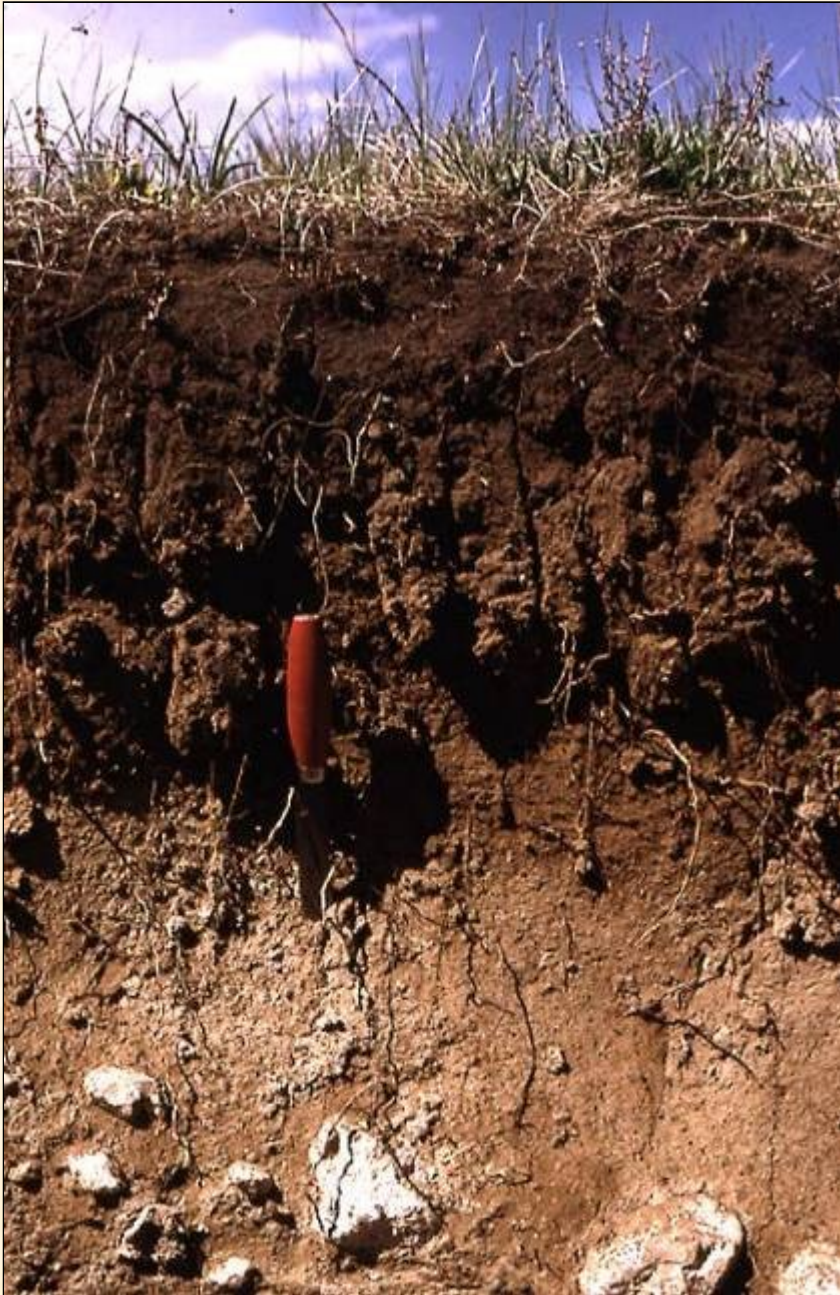
# Soil Physical Parameters

- texture
  - coarse fragments
  - organic matter %
  - depth
  - root restricting layers
- 
- structure
  - porosity
  - bulk density
  - soil-water “flux”

# Physical Characteristic

- Examples - texture, structure, depth, OM, RRL, porosity, ...



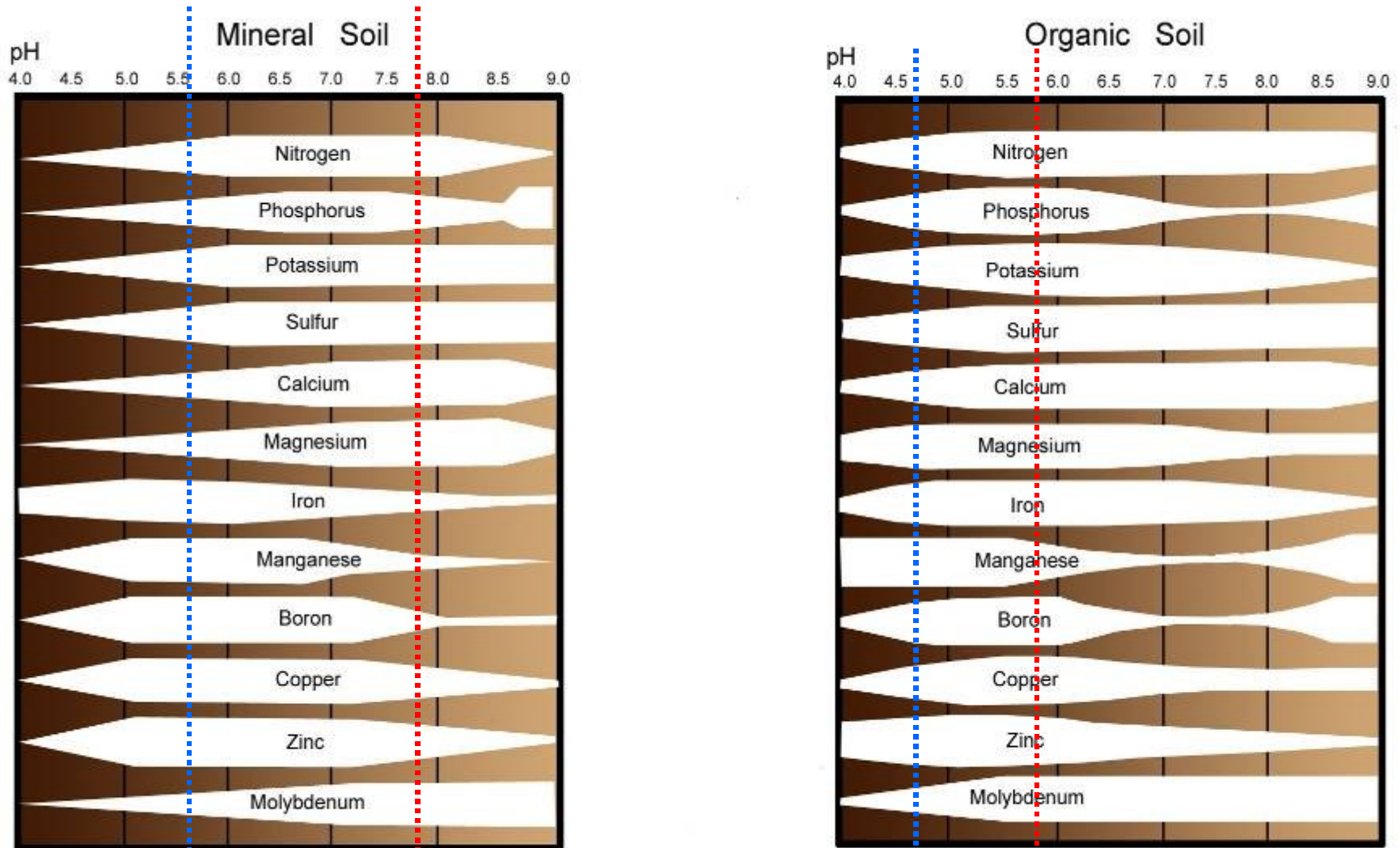


# Soil Chemical Characteristics

- pH
  - acidity or alkalinity
- salts (E.C.)
  - saline
- organic matter %
- nutrients
  - macro
  - micro
- contaminants

# Chemical Characteristic -

## Example - pH impact on nutrient availability



The greater the thickness of the band for a given element, the more available the element is at that pH.

# Soil Biological Parameters



- plants
- roots
- organic matter
  - Living  $\leftrightarrow$  Dead
- micro-organisms
- macro-organisms

# Biological Characteristics

## Examples .....

- Living Organisms (biomass)
  - roots, insects, worms, bacteria, fungi, molds, actinomycetes
- Identifiable Dead Tissue (detritus)
  - roots, leaves, thatch
  - bodies of living organisms
- Very Dead (humus)
  - Non living/non tissue,
  - sugars, acids, starches,
  - compost

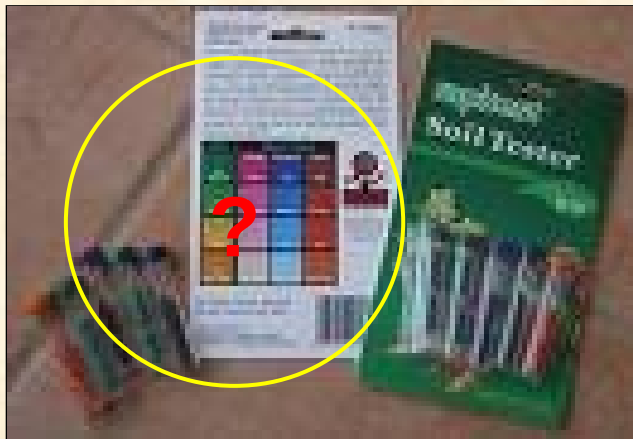


# Has the soil been tested?

## *What parameters, who and how?*

Nutrients, salts, pH ,  
organic matter

- Look, feel, smell, plant growth
- Quick test
- Lab - time and cost



# Is the soil depth adequate?

*For the intended purpose*

Intended Purpose	Suggested Depth above sub grade* (based on BCLNA)
Lawns	100 - 225 mm
Shrubs	150 - 900 mm
Trees	> 600 mm
Xeriscape/natural	Variable with plant size

\* What is the character of the sub grade?

(What is the texture, structure, porosity, density and organic matter content; and degree of blending of break between topsoil and sub grade materials.)

# Can organic amendments be used?

## *Type & Amount*

- Compost

- source:

- yard waste, farm wastes (manure or vegetation), biosolids, food waste, wood waste, or combinations

- quality:

- particle size, particle size distribution, salts, nutrients, contaminants, maturity, C:N ratio, pH
- salts less than 3.0 dS/m
- meets OMRR (or CCC - CCME/BNQ)

- Other materials

- non-composted materials (as above), peat, etc.

- Amount

- between 3% and 20% of volume of the soil mix
- use, source and quality dependant

# Can organic amendments be used?

*mulch or incorporate*

- Incorporate

- if building a “soil” or planting bed
- to improve structure, WHC, and nutrient content
- C:N Ratio - less than 40:1 for incorporated materials

- Mulch

- yard waste, wood waste, high C:N ratio compost, etc.
- not less than 2.5 cm and larger particle size
- will reduce evaporation by as much as 70%
- should not be deeper than 5 to 7 cm

Soils – they are in your hands!

