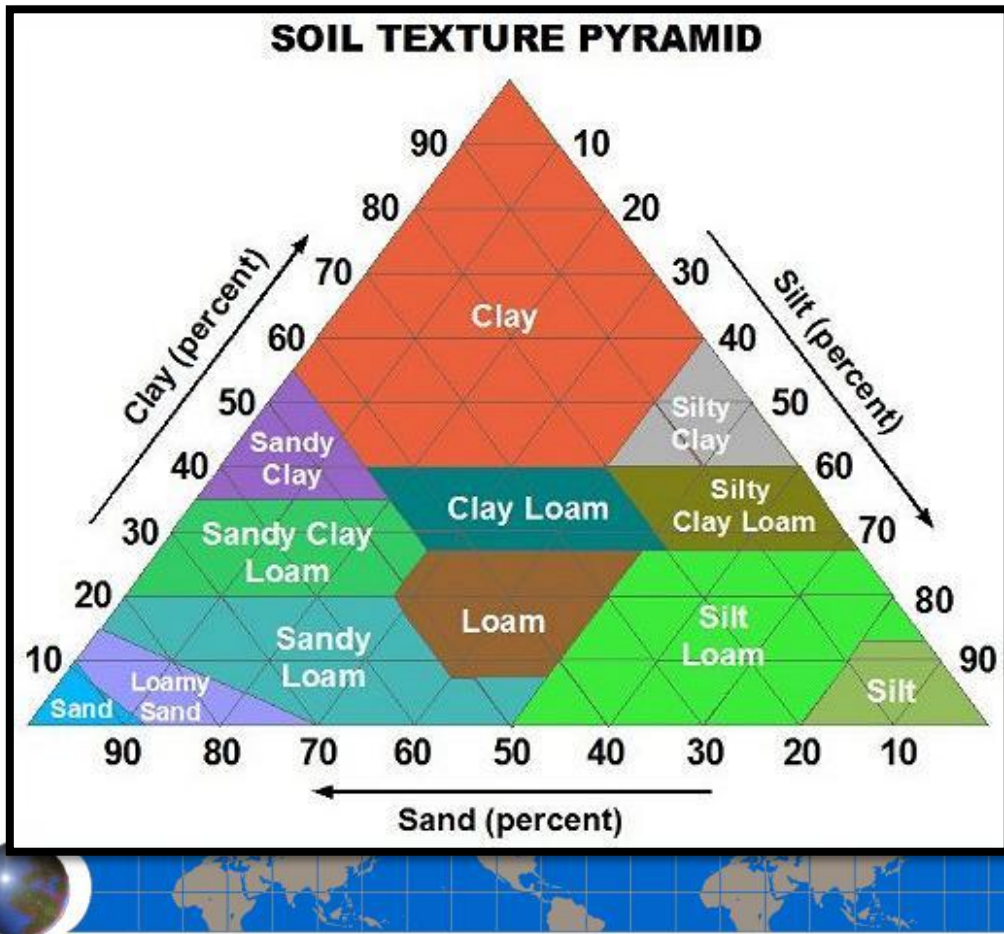




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Types of Soil Structure

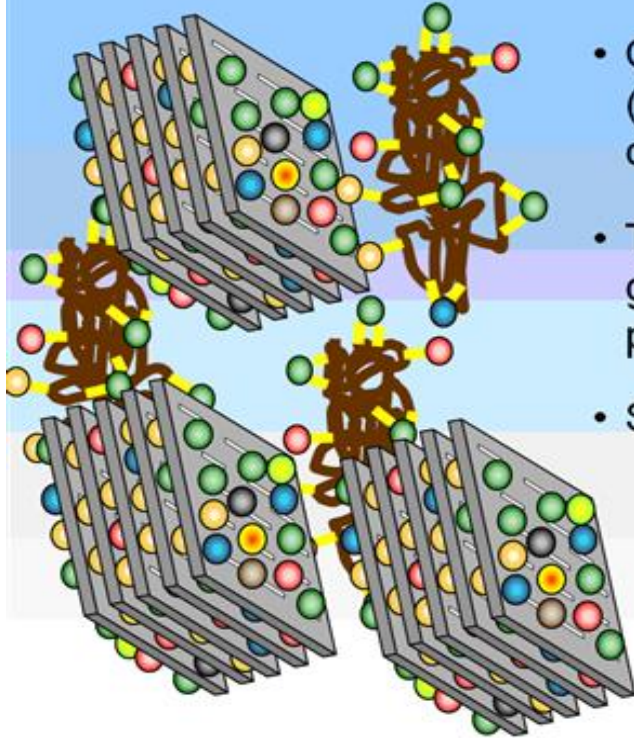


Figure 18.5

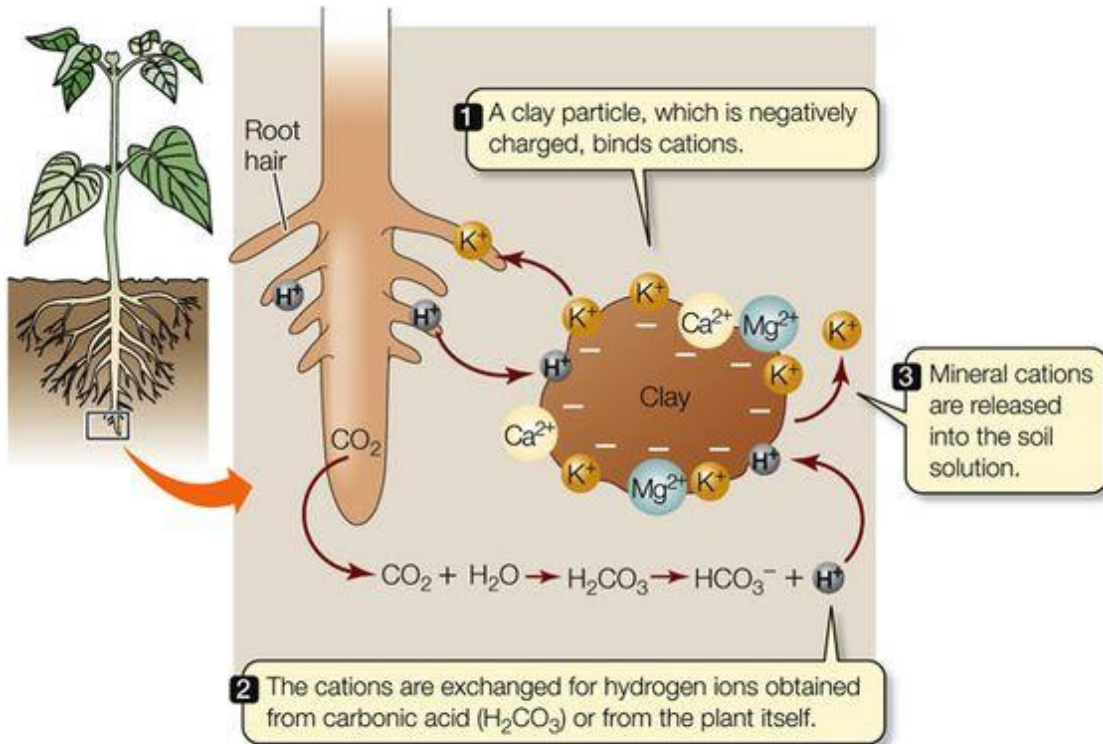




Cation Exchange Capacity



- Cation exchange capacity (CEC) is the total amount of cations that a soil can retain
- The higher the soil CEC the greater ability it has to store plant nutrients
- Soil CEC increases as
 - The amount of clay increases
 - The amount of organic matter increases
 - The soil pH increases

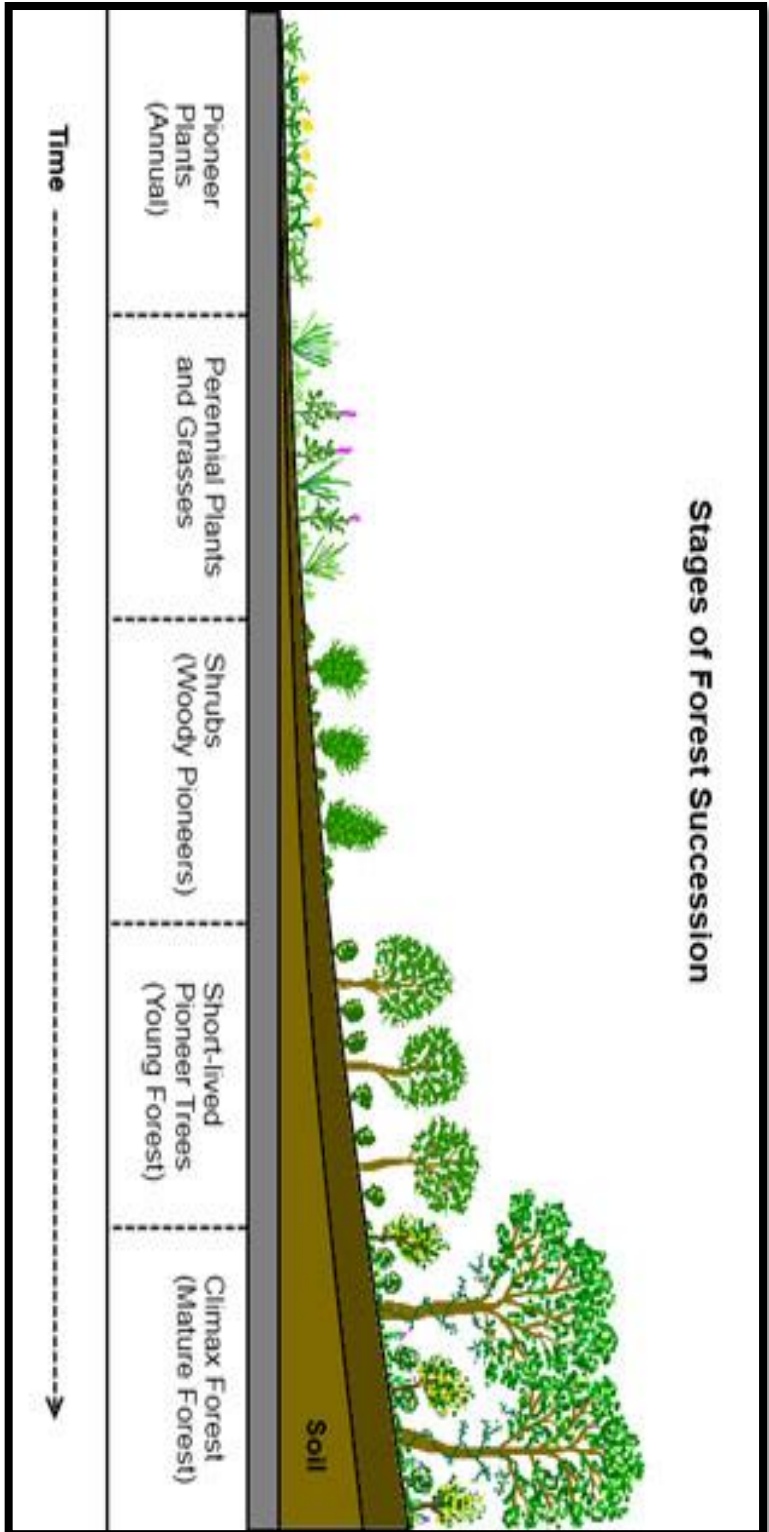


LIFE 8e, Figure 36.6





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The Stages of Forest: There are changes to the tree species over time: Pioneer Stage (What Species?) → Intermediate Stage → (what species?) → Climax Community (What Species?)

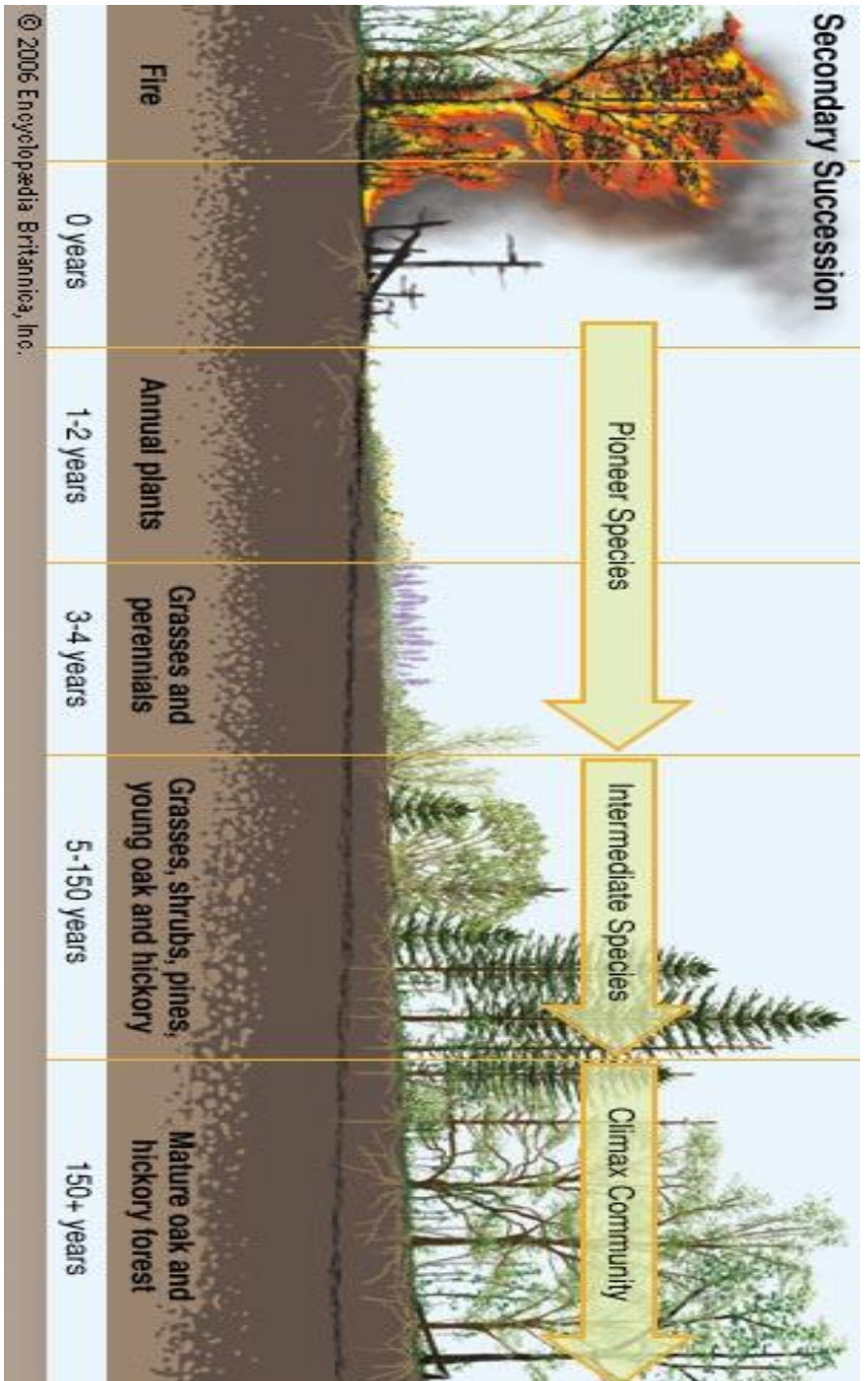
What do we know about the culture of the species in each of the succession stages?

What do we see happening to the soils over the course of time?





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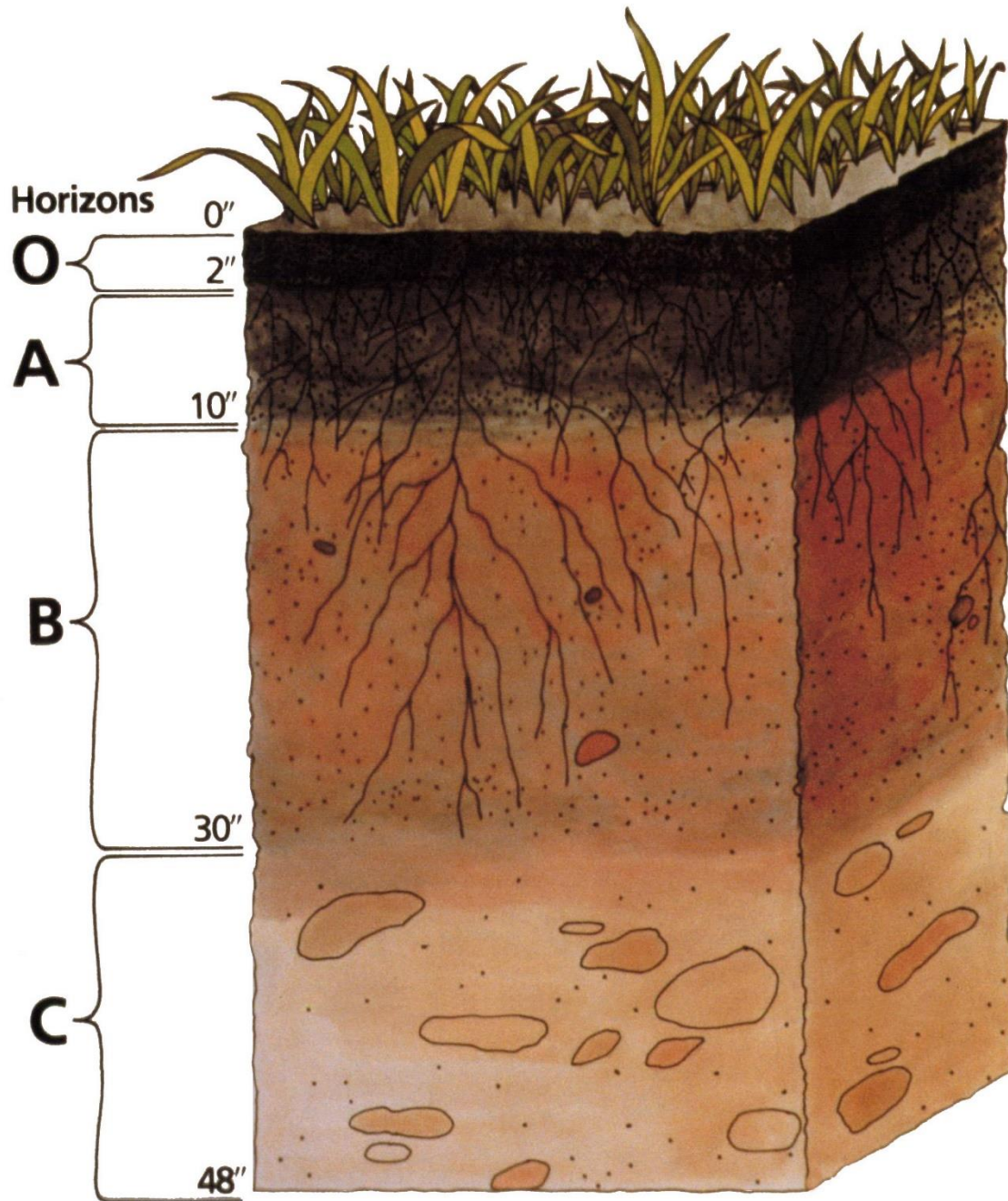
Forest Soils, the living ecology develops with the soil changes and succession of the trees.

- Without soil biology, trees struggle to survive
- The soil ecology is essential for:
 - Transfer of nutrients
 - Aeration
 - Decomposition





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What does the O & A Horizon look like in:

- Pioneer Stage
- Intermediate Stage
- Climax Stage

WHY?





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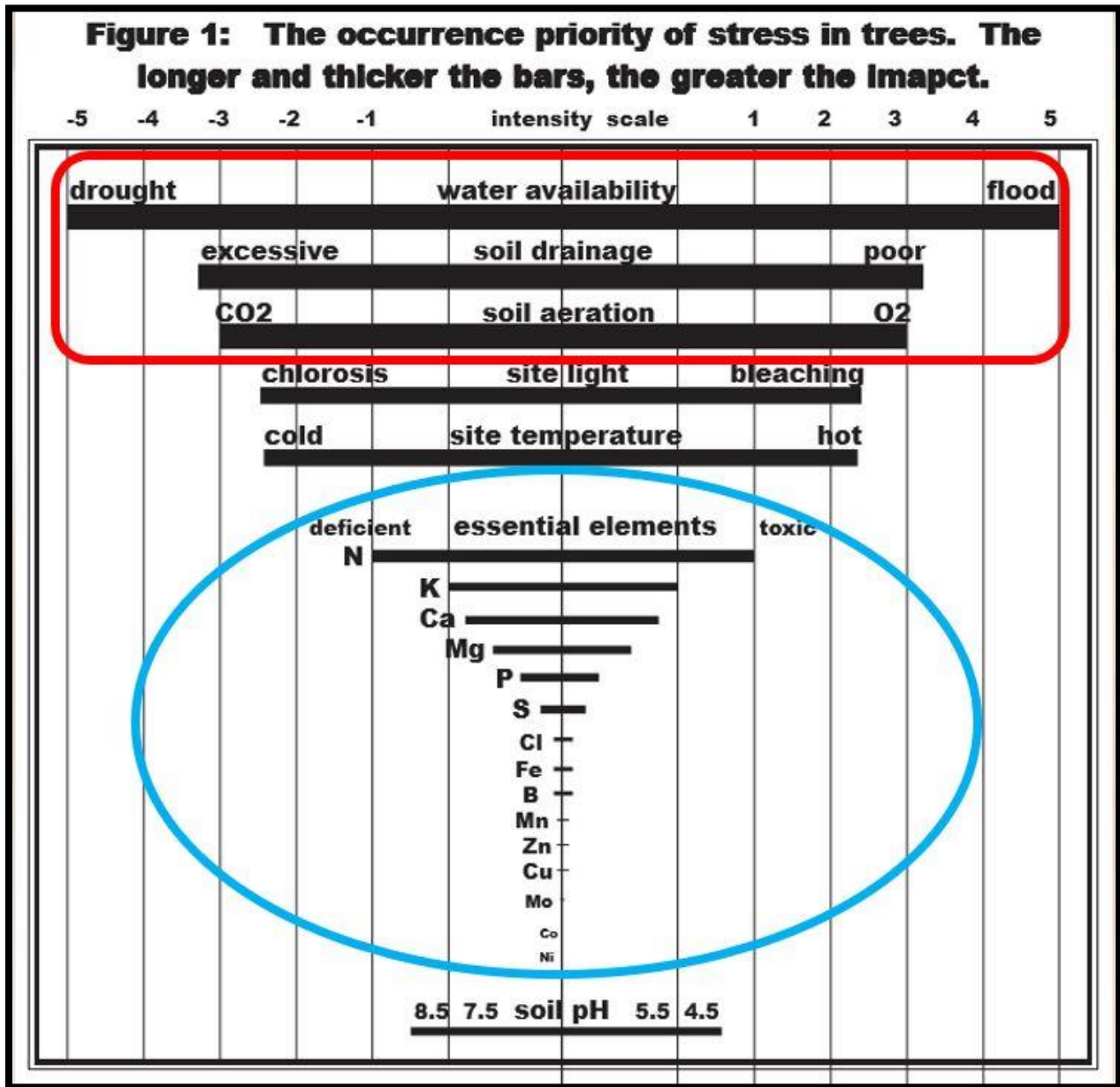


The more intense the lawns and landscapes are managed, the more compacted the soils become – requiring more intense management to aerate soils for trees.





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Soil compaction is the most prevalent of all soil constraints on shade and street tree growth. Every place where humans and machines exist, and the infrastructures that support them are built, soil compaction is present.

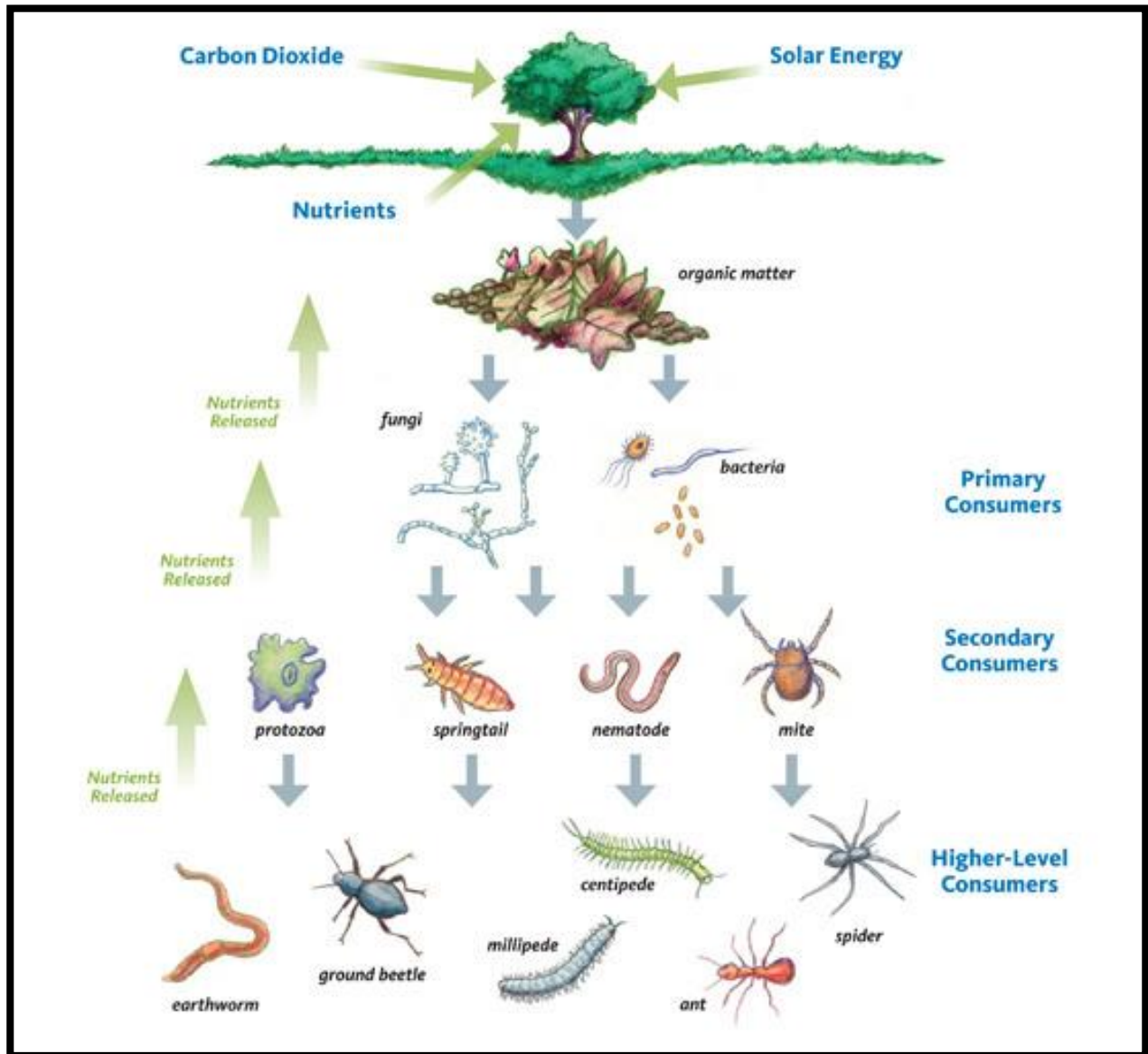
Soil compaction is a fact of life for trees and for tree health care providers. Unfortunately, prevention and correction procedures are not readily used nor recognized for their value.

Dr. Kim Coder; *Soil Compaction Stress & Trees: Symptoms, Measures, Treatment*





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Without pore space, the necessary soil biology needed for decomposition and nutrient release for the plants is limited or non-existent





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What if we take a Holistic approach to soil health & nutrients?

Consider a more organic approach of mulching

Reduce turf (*yeah, yeah, I know... the client doesn't like the idea...*)

Increase decomposition = more soil biology = more nutrients

Reduce compaction = more pore space = More soil biology

Consider more Air-tool prescription

Reduce compaction very quickly = improve soil structure

Incorporate compost = more soil biology instantly

Incorporate large particle compost (varying states of decomposition) =

Maintain soil structure longer

Control compaction longer





Introduce Bio-stimulants & organic (mineral) fertilizer

Geisseler and Scow concluded “that mineral fertilizer application led to a 15.1% increase in the microbial biomass above levels in unfertilized control treatments. Mineral fertilization also increased soil organic carbon content.

Nitrogen fertilizer, in particular, is often beneficial to soils because nitrogen supply often limits natural plant production. When we add nitrogen in agricultural systems, productivity increases, more plant material (biomass) is produced and so, in time, soil organic matter increases. This then increases microbial levels in the soil.

