A-GrowSBF

AGROW SYNERGY

Soil Bacteria **Food**

LIVING SOIL

SOLUTIONS

Marketed and distributed exclusively by:
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Statistics show 50% of the world's cropland is bare in any 12 month period – hence losing soil carbon

Global cropland continues to be abandoned at the rate of 10 million hectares (25 million acres) a year

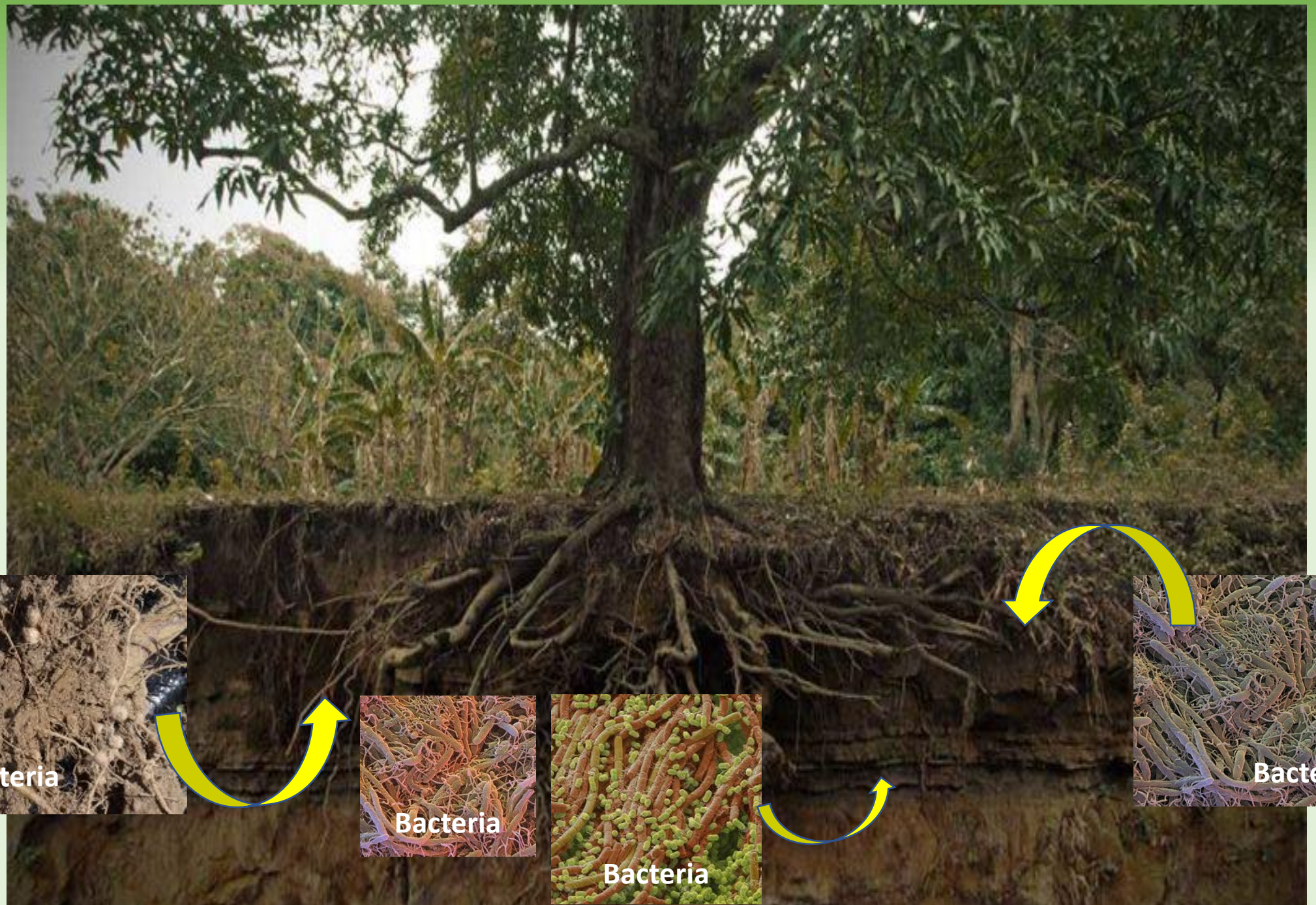
(Pimental & Burgess 2013)

30% of the world's cropland has been abandoned in the last 40 years due to soil decline

(Pimental & Burgess 2013)

AGROW SYNERGY
SMART SOIL SOLUTIONS

A-GrowSBF


Bacteria
Bacteria
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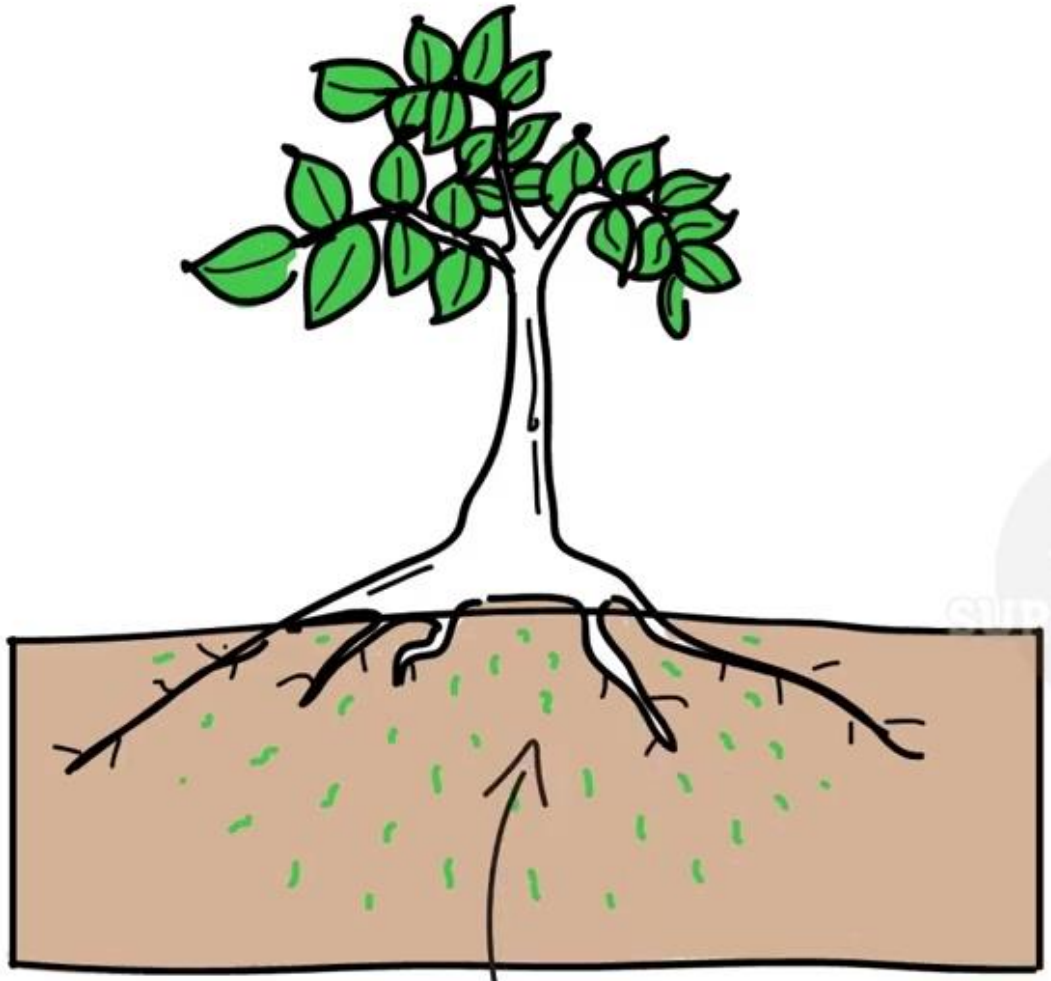
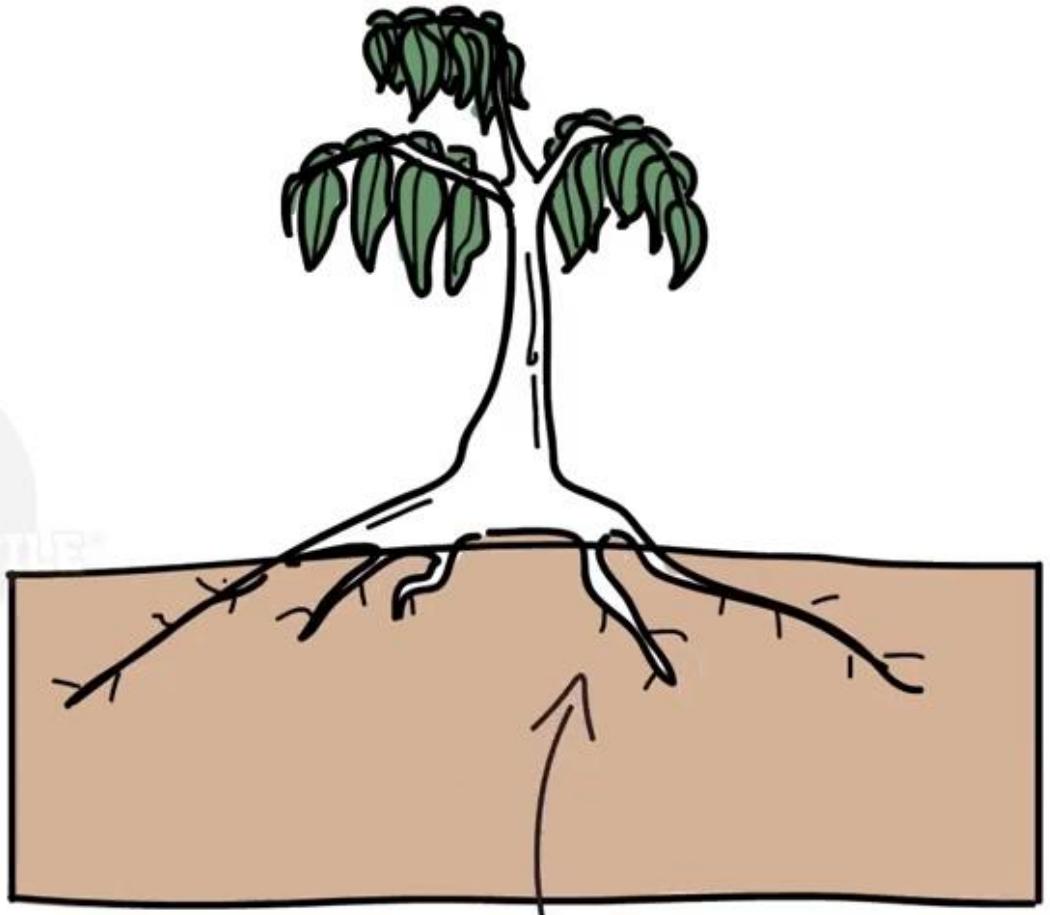
Bacteria



LOTS OF GOOD BACTERIA



LESS GOOD BACTERIA

Healthy Living Soil

A-GrowSBF Organic Soil Amendment and Plant Bio-Stimulant

1. Polysaccharides (25%)
2. Amino Acids (25%)
3. Soluble NPK Nutrients
4. Natural Enzymes
5. Bio Stimulants
6. B Complex Vitamins
7. Natural Highly Stable Carbon Brownish Viscous Liquid

AGROW SYNERGY

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Technology & Innovation in Agriculture

Four Major Soil Functional Bacteria Groups: decomposers, mutualists, pathogens and lithotrophs.

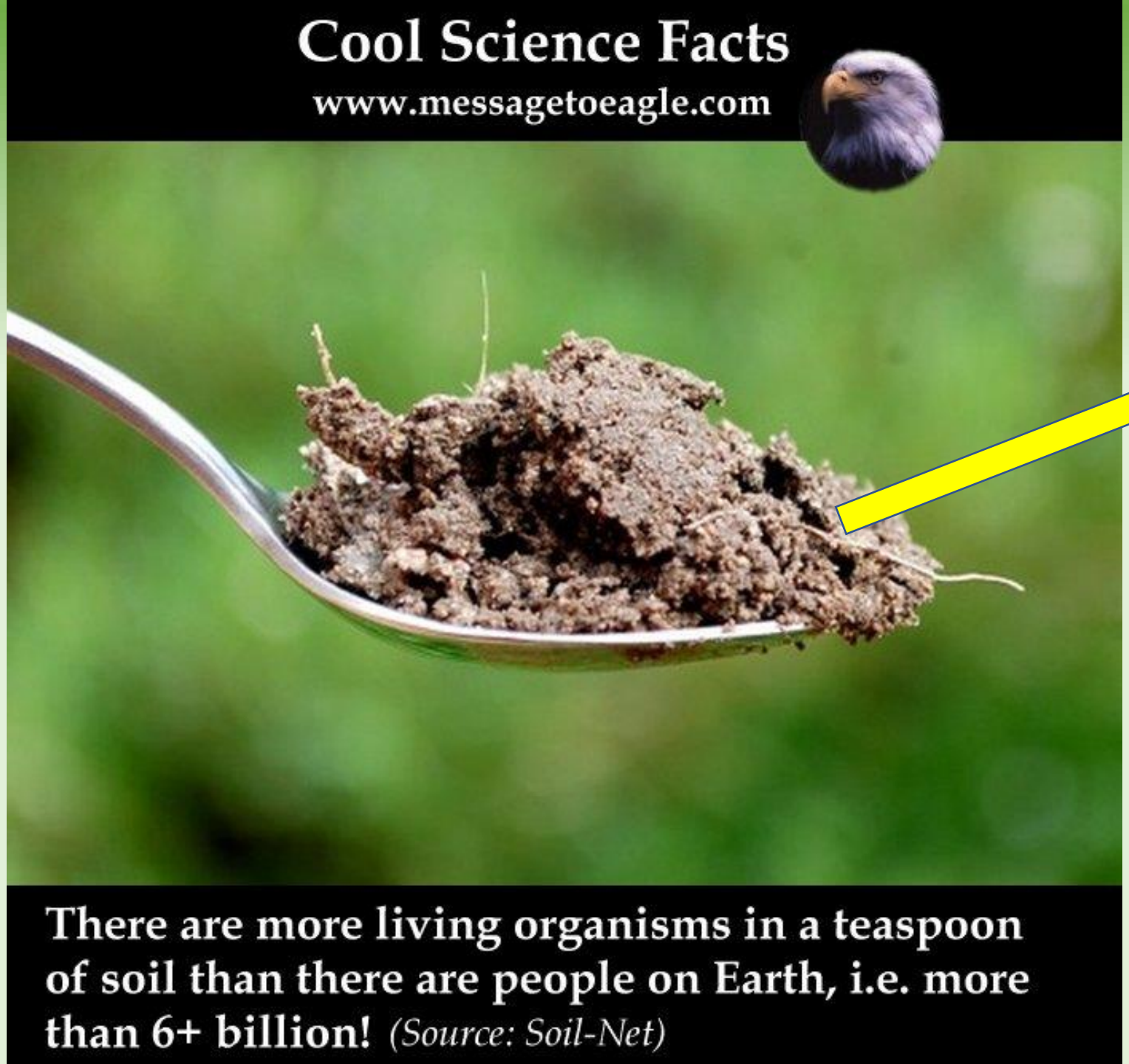
The **decomposer**s consume the easy-to-digest carbon compounds and simple sugars and tie up soluble nutrients like nitrogen in their cell membranes. Bacteria dominate in tilled soils but they are only 20-30 percent efficient at recycling carbon (C).

Of the **mutualistic** bacteria, there are four bacteria types that convert atmospheric nitrogen (N_2) into nitrogen for plants. There are three types of soil bacteria that fix nitrogen without a plant host and live freely in the soil and these include *Azotobacter*, *Azospirillum* and *Clostridium*.
The *Rhizobium* bacteria (gram negative rod-shaped bacteria) species associate with a plant host.

Pathogenic bacteria cause diseases in plants and a good example are bacteria blights. Healthy and diverse soil bacteria populations produce antibiotics that protect the plants from disease causing organisms and plant pathogens.

Lithotrophs (chemoautotrophs) get their energy from compounds other than carbon (like nitrogen or sulfur) and include species important in nitrogen and sulfur recycling.

Actinomycetes have large filaments or hyphae and act similar to fungus in processing soil organic residues which are hard to decompose (chitin, lignin, etc.)



At least 600 million to 1 billion 75,000 species of Bacteria
And only 5,000 being catalogued as at 2020 (Professor Dr. Elaine Ingham)

Soil Benefits from Bacteria

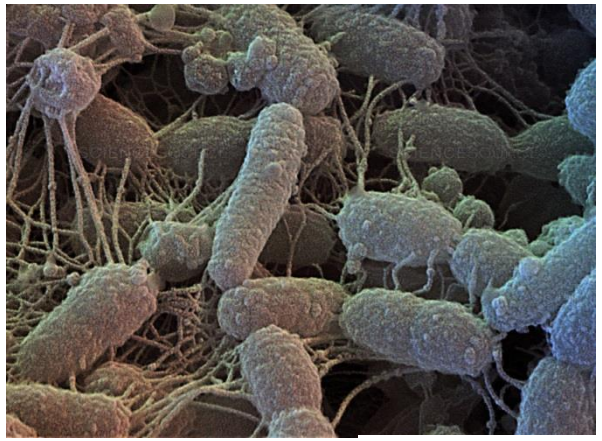
Bacteria are important in producing polysaccharides that cement sand, silt and clay particles together to form microaggregates and improve soil structure (Hoorman, 2011).

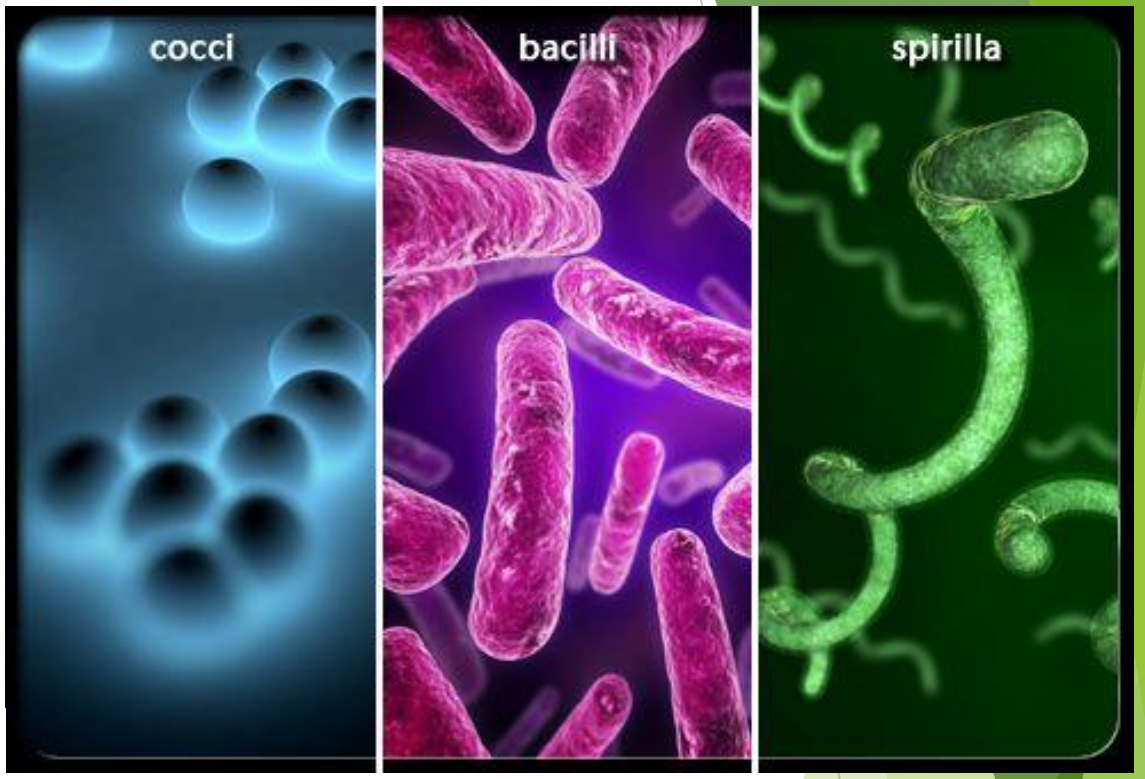
Bacteria provide large quantities of nitrogen to plants and nitrogen is often lacking in the soil.

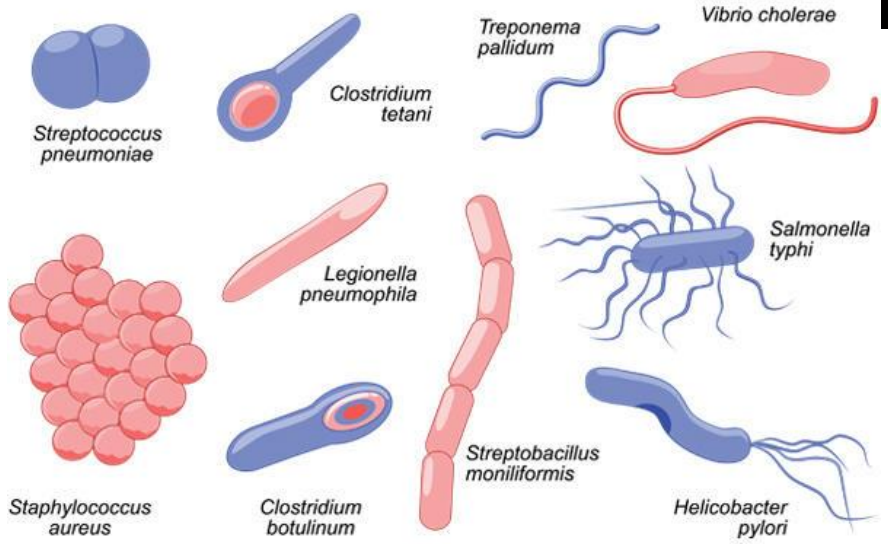
Many bacteria secrete enzymes in the soil to makes phosphorus more soluble and plant available.

Bacteria change the soil environment so that certain plant species can exist and proliferate.

Bacteria generally have three major shapes: rod, sphere or spiral. Actinomycetes are still classified as bacteria but are similar to fungi except they are smaller in size. Classifying bacteria by shape is complex because many bacteria have different shapes and different arrangements.

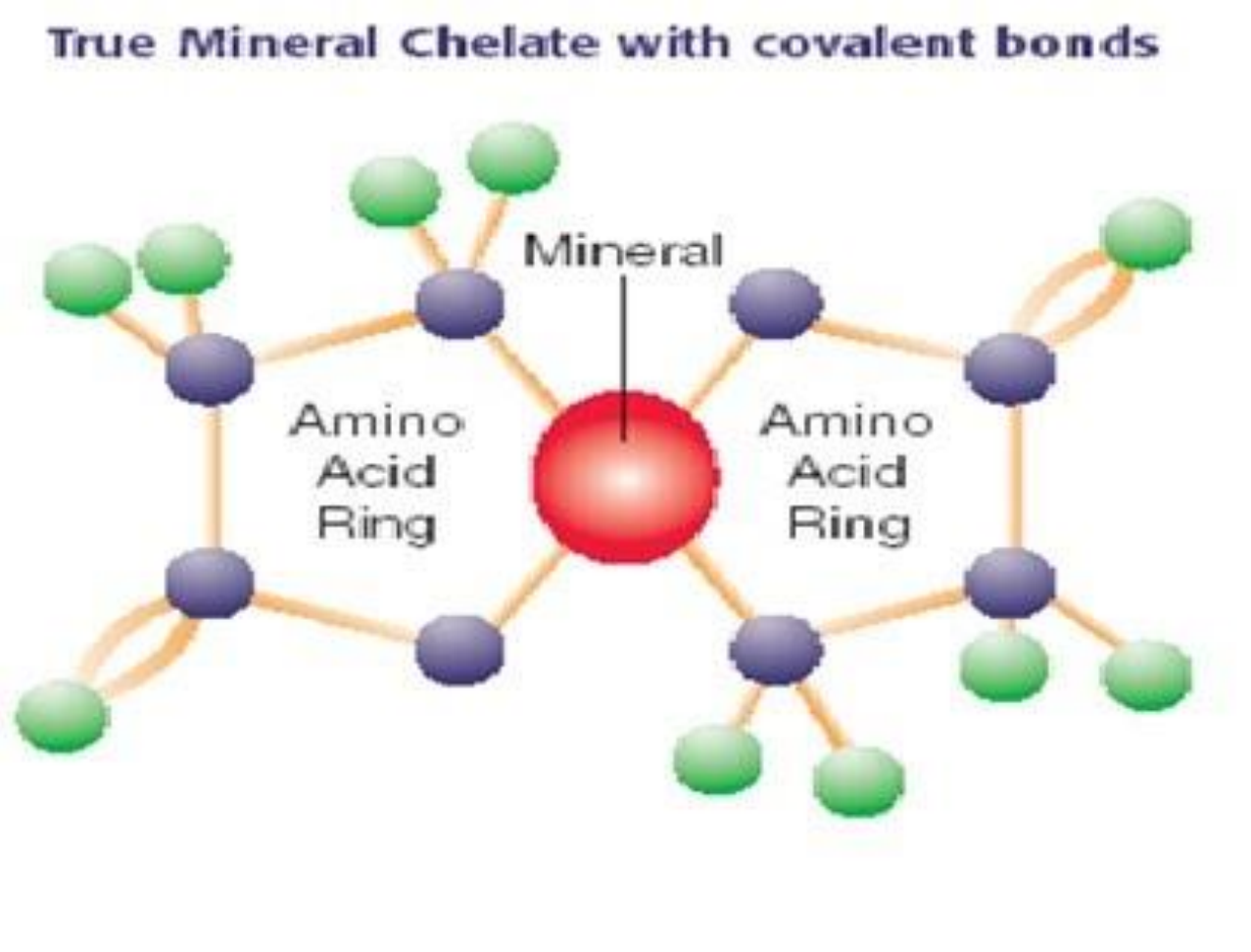






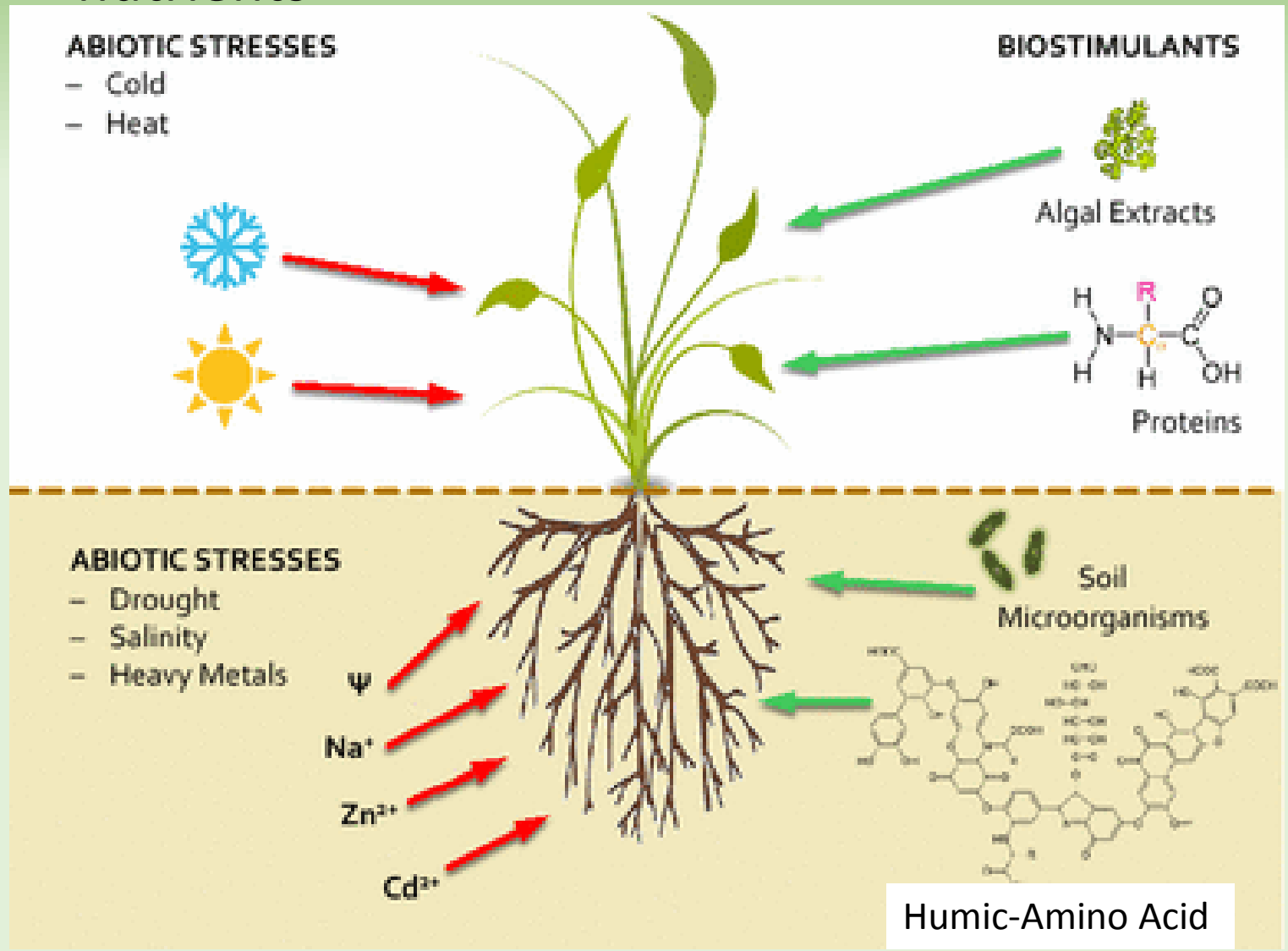
Proteinogenic Amino acids

*acts as a cytoplasm osmotic bio-stimulant chelating agent which help plants improve absorption



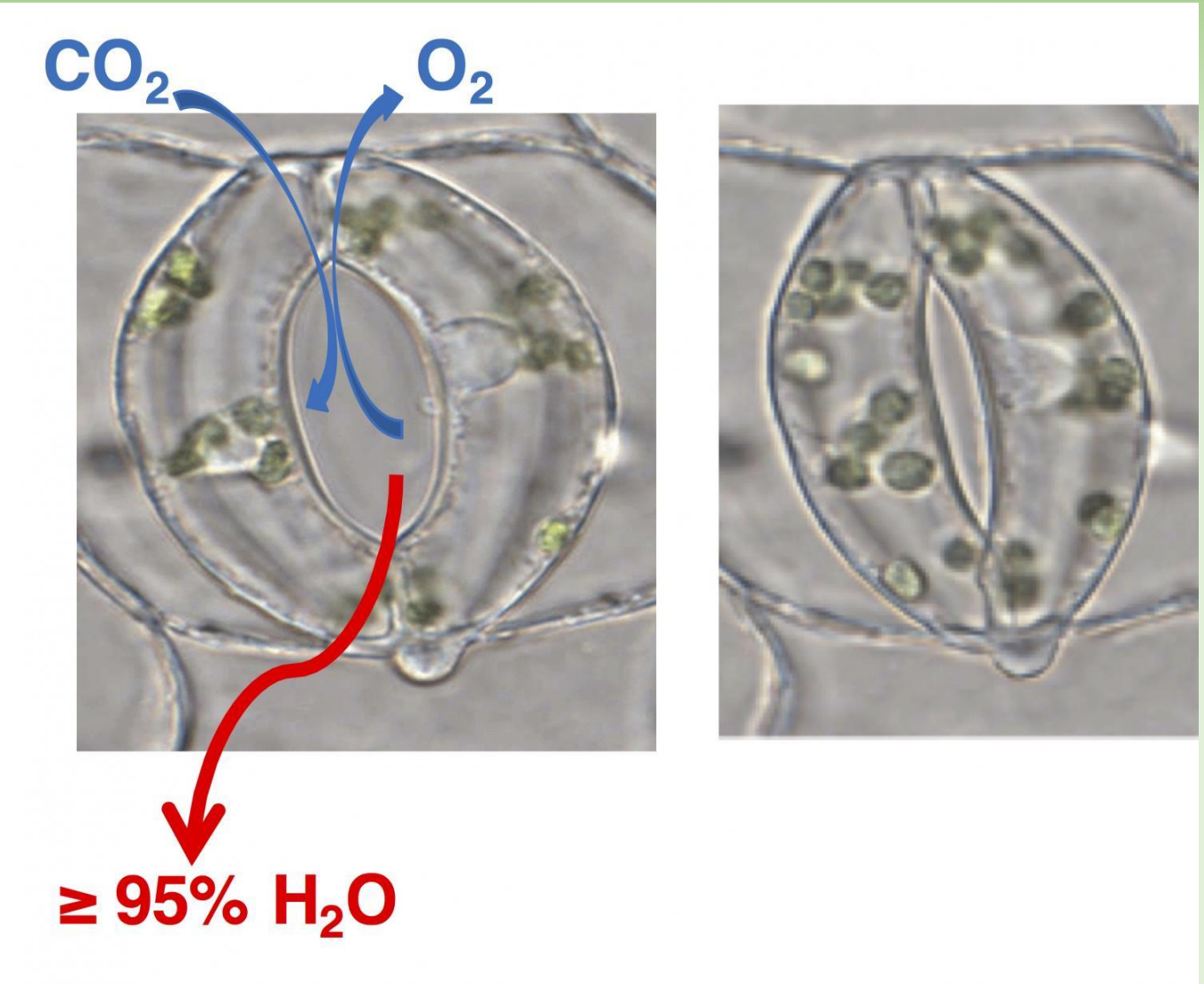
Proteinogenic Amino acids

*translocation of macro and trace nutrients



Proteinogenic Amino acids

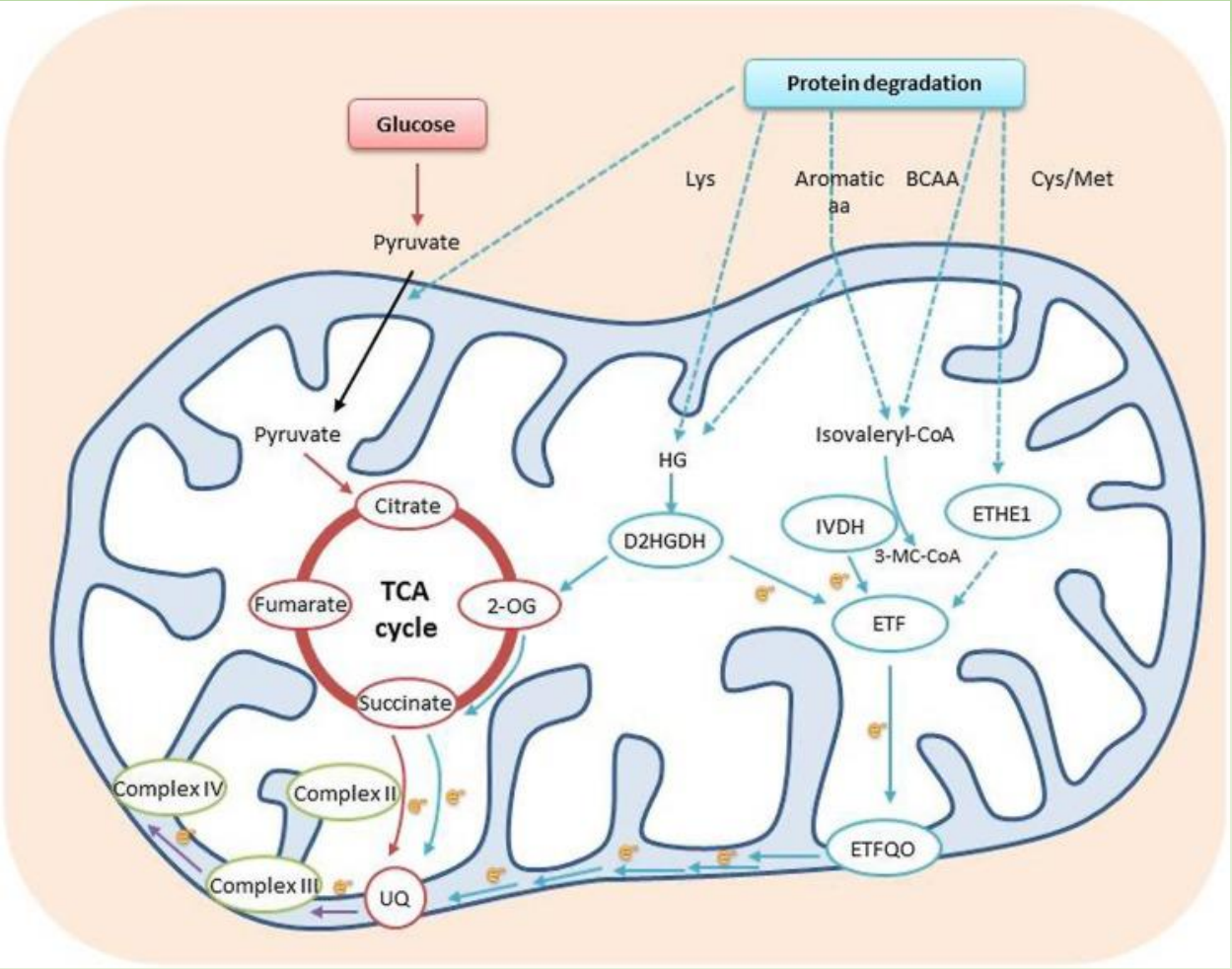
*aid in opening of stomatas



Open (left) and closed (right) stomata found on the surface of plants' leaves, stems and other organs. Through the stomata, plants exchange oxygen and carbon dioxide, and lose more than 95 percent of their water as well. Therefore, correct regulation of stomata closure is important to adapt to drought conditions

Proteinogenic Amino acids

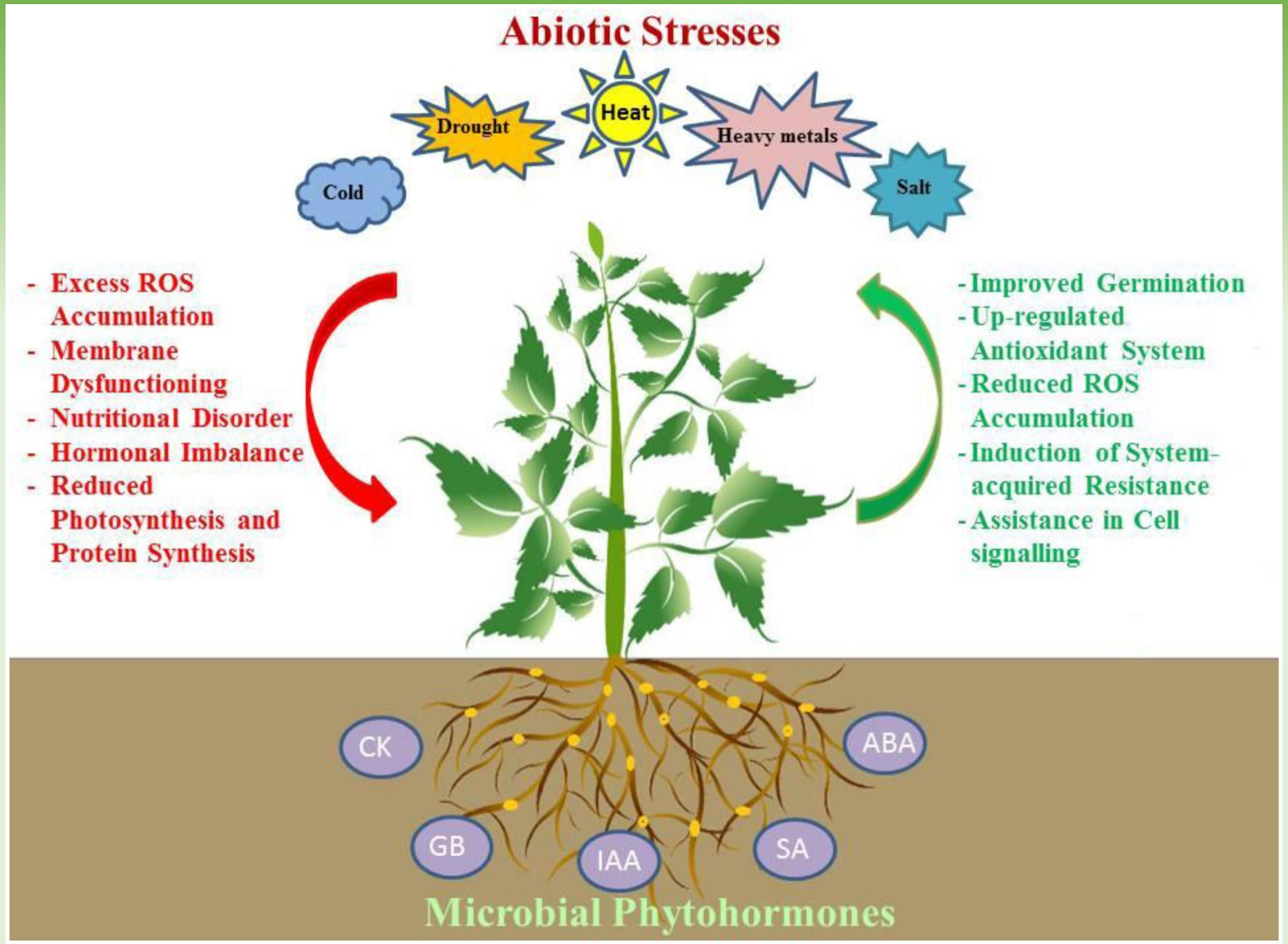
*increase photosynthesis chlorophyll concentration which makes crops lush and this result in good plant growth,



Amino acids can be used as electron donors to the mitochondrial electron transport chain

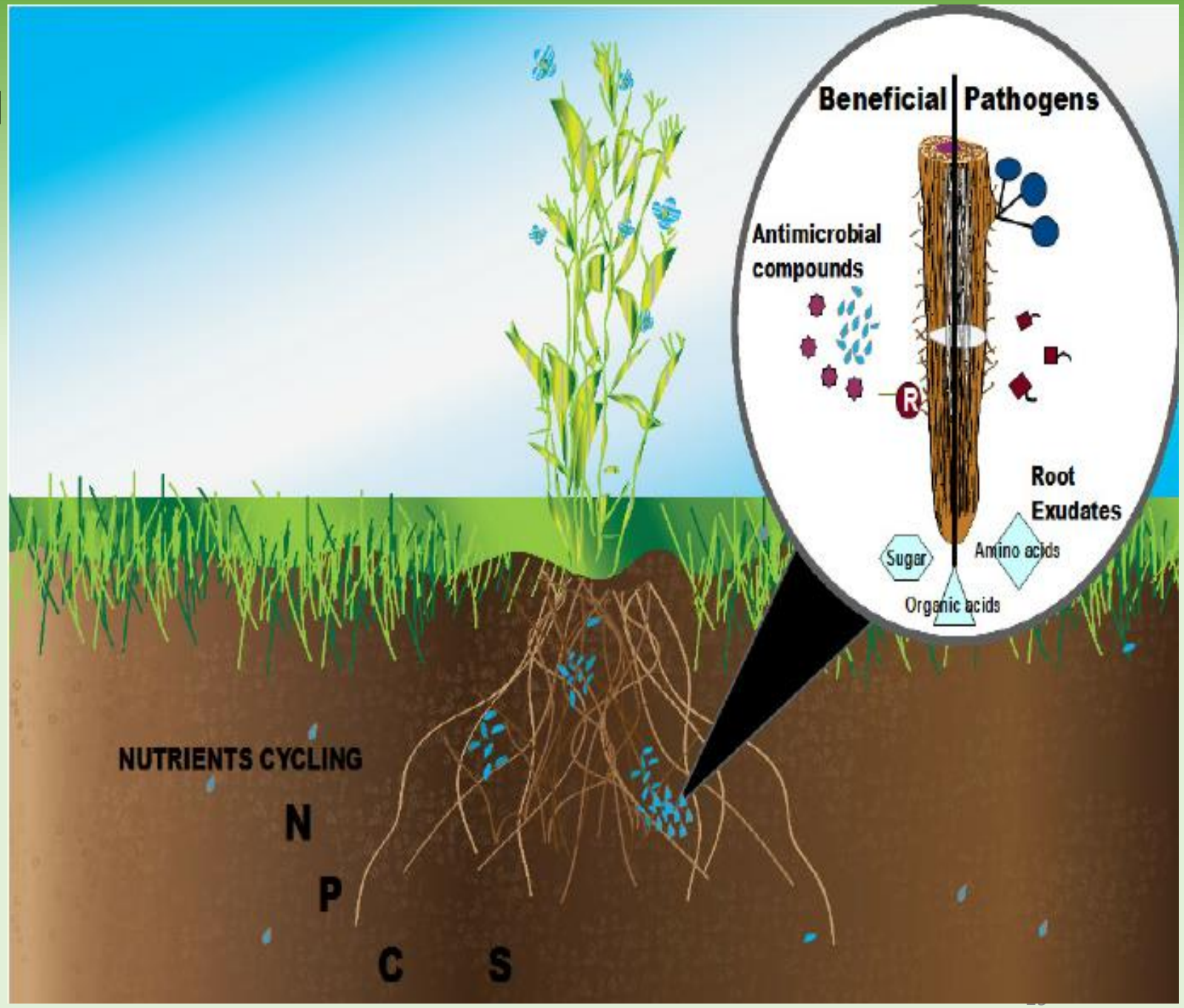
Proteinogenic Amino acids

*increase yield and reduces abiotic stresses.



Proteinogenic Amino acids

*It also acts as equilibrium of soil microbial flora to improve mineralization of the organic matter and formation of a good soil structure and fertility around the roots.



AGrowHumac is very good for crops and plants like:

- Oil Palm
- Coconuts
- Durians
- Pineapples
- Water Melons
- Mangoes
- Bananas
- Papayas
- Soursop
- Guavas
- Logans
- Rambutans
- Corn
- Fruit & Leafy Vegetables
- Horticultures
- Paddy
- Fish Pond Embankment

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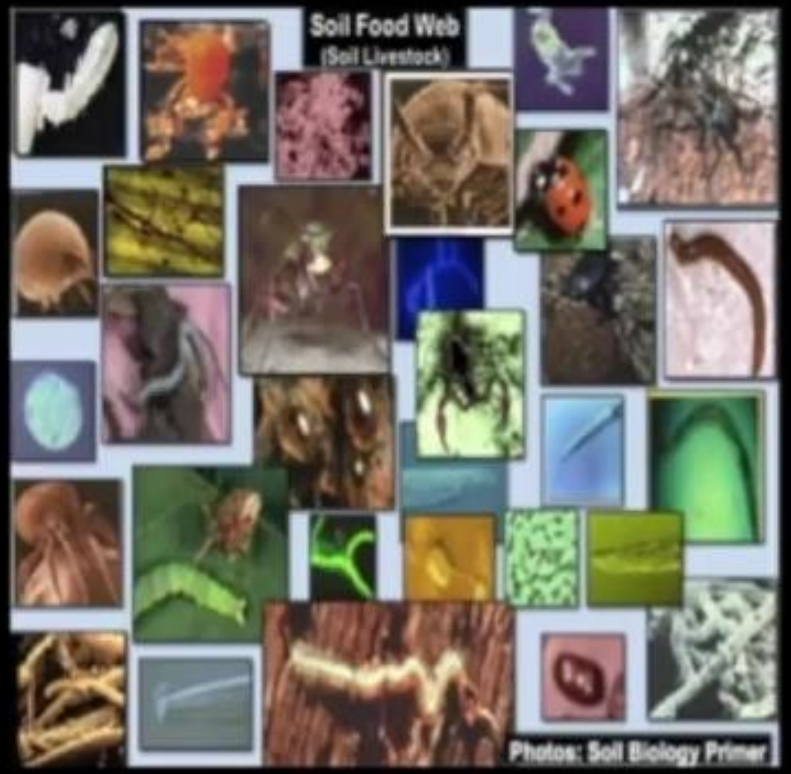
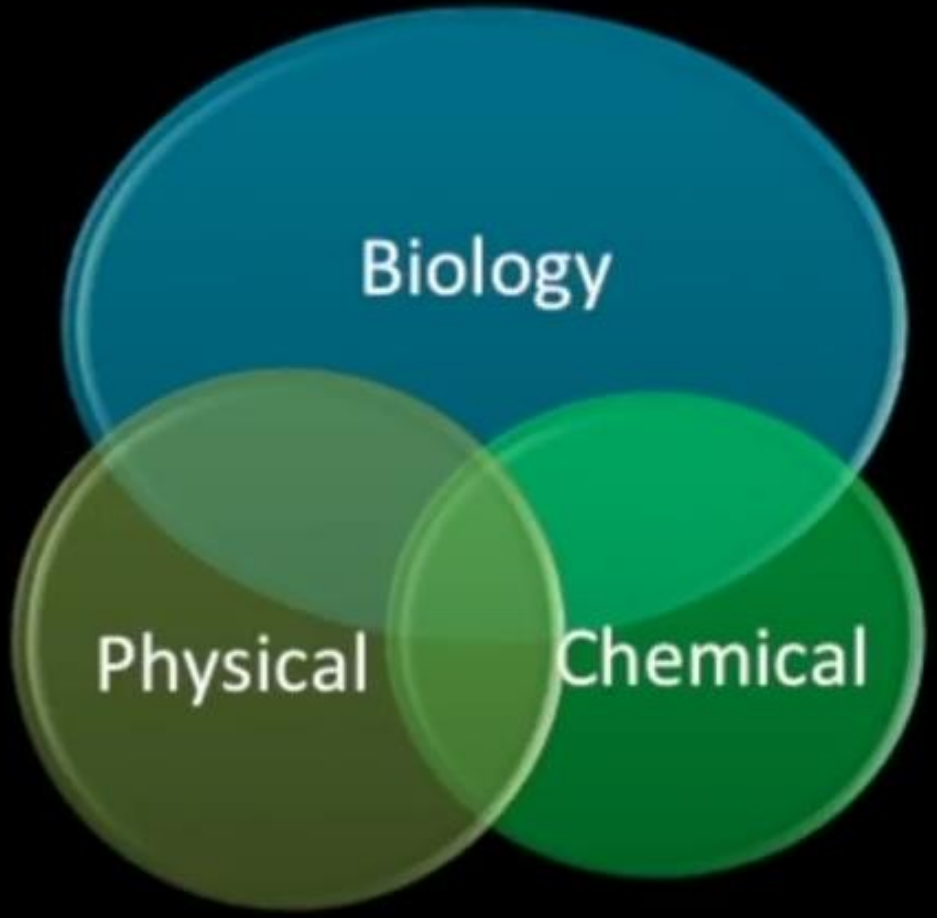
Soil Without Biology Is Geology





Thank You

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