



Soil Life: Beyond Dirt!

Compost's Empowering Role in Sustainable Soils



Let's Grow Together

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Director of Sustainability & Chairman of the Board

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When the land heals, people find hope

Poverty and the environment are more closely connected than we might think. In fact, the majority of the world's poorest people live in rural areas. Equipped with the knowledge, tools and resources to restore and develop their land sustainably, impoverished communities are able to lift themselves out of poverty and achieve self-reliance.

This is the mission behind Kellogg's partnership with Plant With Purpose, a humanitarian organization dedicated to helping rural poor around the globe adopt sustainable farming practices that protect the land and





68.5% of PWP households in Haiti are practicing *composting*





Affirming THEIR Journey Plant with Purpose





They GET It!





The Importance of Compost for Landscape & Gardens

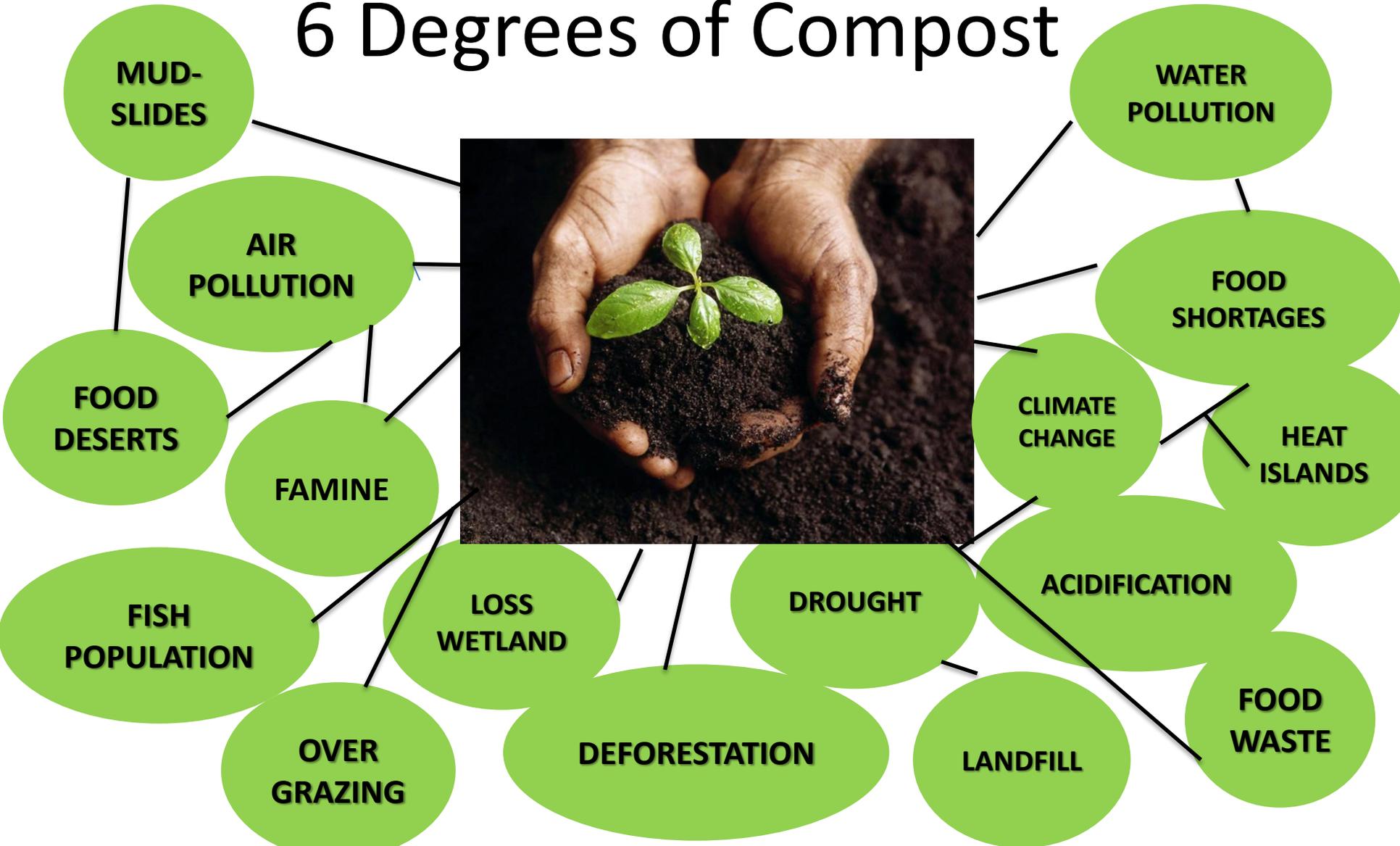




**Compost – The
Swiss Army Knife
of Environmental
Solutions!**

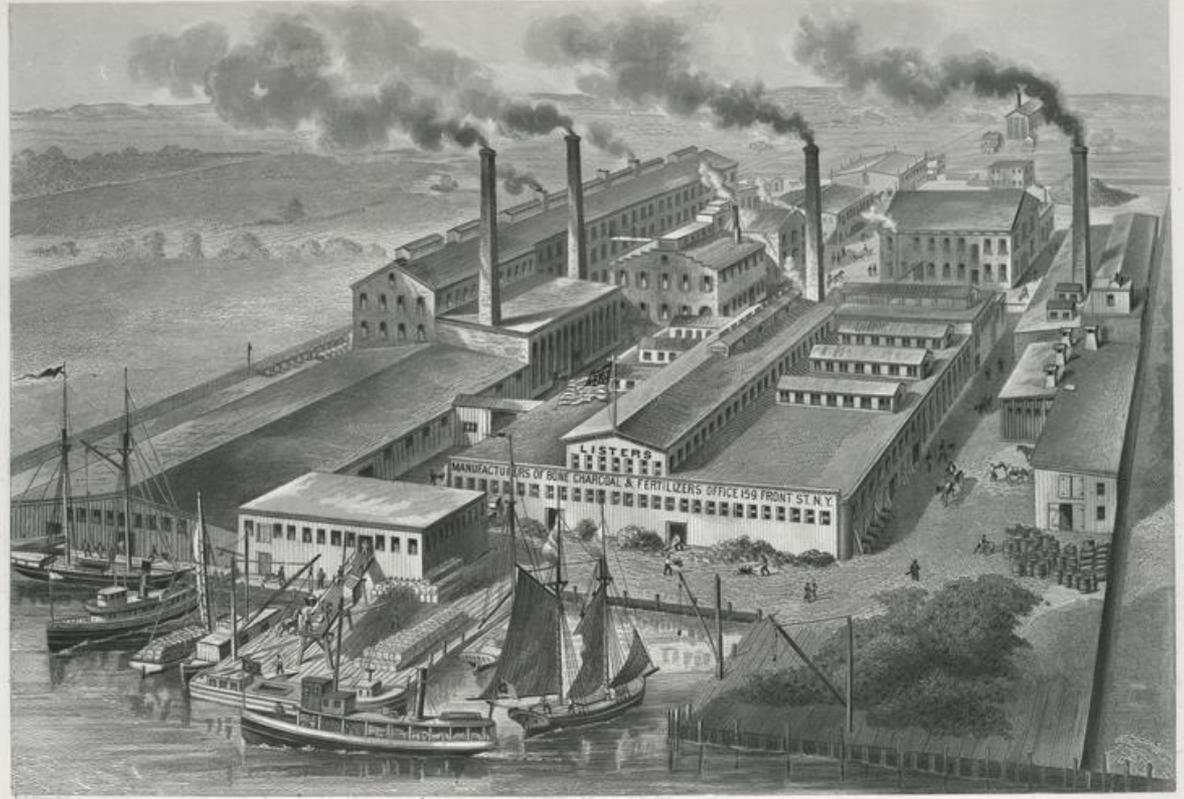


6 Degrees of Compost





The War To End All Wars



Russiac Agricultural Chemical Works

LISTER BROTHERS, PROPRIETORS, NEWARK, N.J.



A nation that destroys its soils destroys itself.
Forests are the lungs of our land, purifying the air
and giving fresh strength to our people.

(Franklin D. Roosevelt) *CIRCA 1937*



“Much like the accidental discovery of vulcanized rubber and penicillin, Nitrohumus was discovered quite by accident.”

H. Clay Kellogg CIRCA 1930's





We Were ORGANIC ...



When ORGANIC wasn't Cool!







A Wonderful Life??





Research Highlights

- CO₂_e Impact from:
 - Energy savings
 - Buying **RECYCLED**
 - Water conservation in our operations
 - Waste recovery
 - Displacement of chemical fertilizers
 - Water savings with use of organics in soil



What is CO₂_e?

- ***CARBON EQUIVALENTS***
- ***Contributing to Green House Gas***
- A TON OF CO₂_e IS ONE passenger's Share of a round trip flight from Seattle to London



If You Have Energy Data

If You Have Emissions Data

Please note that these estimates are approximate and should not be used for emission inventory or formal carbon footprinting exercises. Read more about the caveats and explanations on the [Calculations and References page](#)

Amount	Unit	Gas
<input type="text" value="1"/>	Metric Tons	CO ₂ - Carbon Dioxide or CO₂ Equivalent*
<input type="text"/>	Metric Tons	Carbon or Carbon Equivalent
<input type="text"/>	Metric Tons	CH ₄ - Methane
<input type="text"/>	Metric Tons	N ₂ O - Nitrous Oxide
<input type="text"/>	Metric Tons	HFC-23 - Hydrofluorocarbon gases
<input type="text"/>	Metric Tons	CF ₄ - Perfluorocarbon gases
<input type="text"/>	Metric Tons	SF ₆ - Sulfur Hexafluoride

Calculate





How Can a Company Reduce CO2e?

Energy Related Emissions per Unit Revenue





Solar Panels





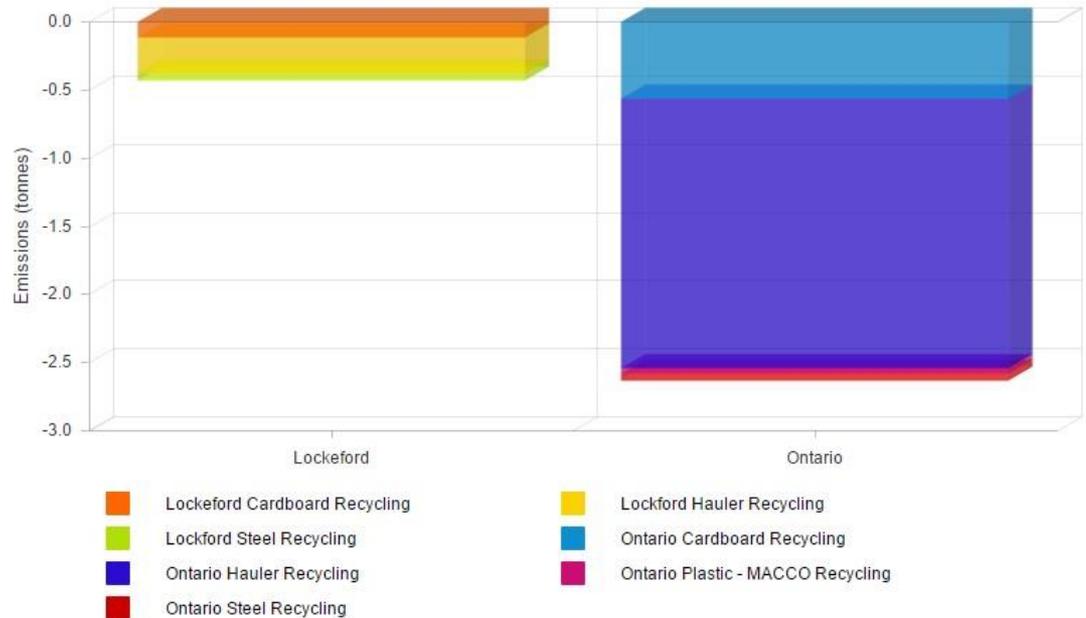
Zero Waste

Emissions Avoided by Recycling



Kellogg Emissions in tonnes, 2011 - 2013

7 Trackers for Tag: 136, Grouped by Node





Displacement of Synthetics

Product Benefits

Kellogg manufactures compost and mulch, each of which lead to significant environmental benefits.

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Displacement of Synthetic Fertilizer

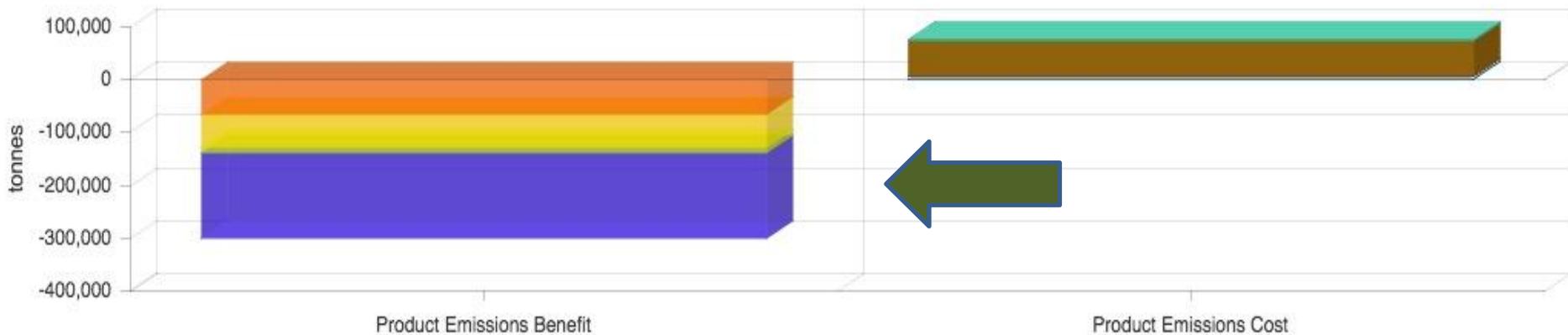
In shipping organic compost, Kellogg and its customers displace the use of emissions intensive synthetic fertilizers. This results in significant avoided emissions.





Compost USE in Soil Benefits Outweigh Costs

Emissions, 2014



- Decreased Fertilizer Benefit
- Decreased Water Benefit
- Increased Carbon Storage Benefit**
- Lockeford Rolling Stock (Diesel) Onsite
- Lockeford storm water ponds
- Ontario Purple Pipe water use
- Outbound Product Freight

- Decreased Soil Erosion Benefit
- Inbound Raw Material Freight
- Lockeford Electricity
- Lockeford Rolling Stock (Gas) Onsite
- Ontario Electricity
- Ontario Rolling Stock (Diesel) Onsite
- Product Process Fugitive Emissions

one teaspoon of healthy soil contains...

100 million -

1 billion
individual bacteria

Microscopic life and processes below ground
are more abundant than life above the ground.

did you know?

Millions of species and billions of organisms—bacteria, algae, microscopic insects, earthworms, beetles, ants, mites, fungi and more reside in the soil—representing the greatest concentration of biomass anywhere on the planet.

Microbes, which make up only 1-half of 1 percent of the total soil mass, are the yeasts, algae, protozoa, bacteria, nematodes, and fungi that process organic matter into rich, dark, stable humus in the soil.

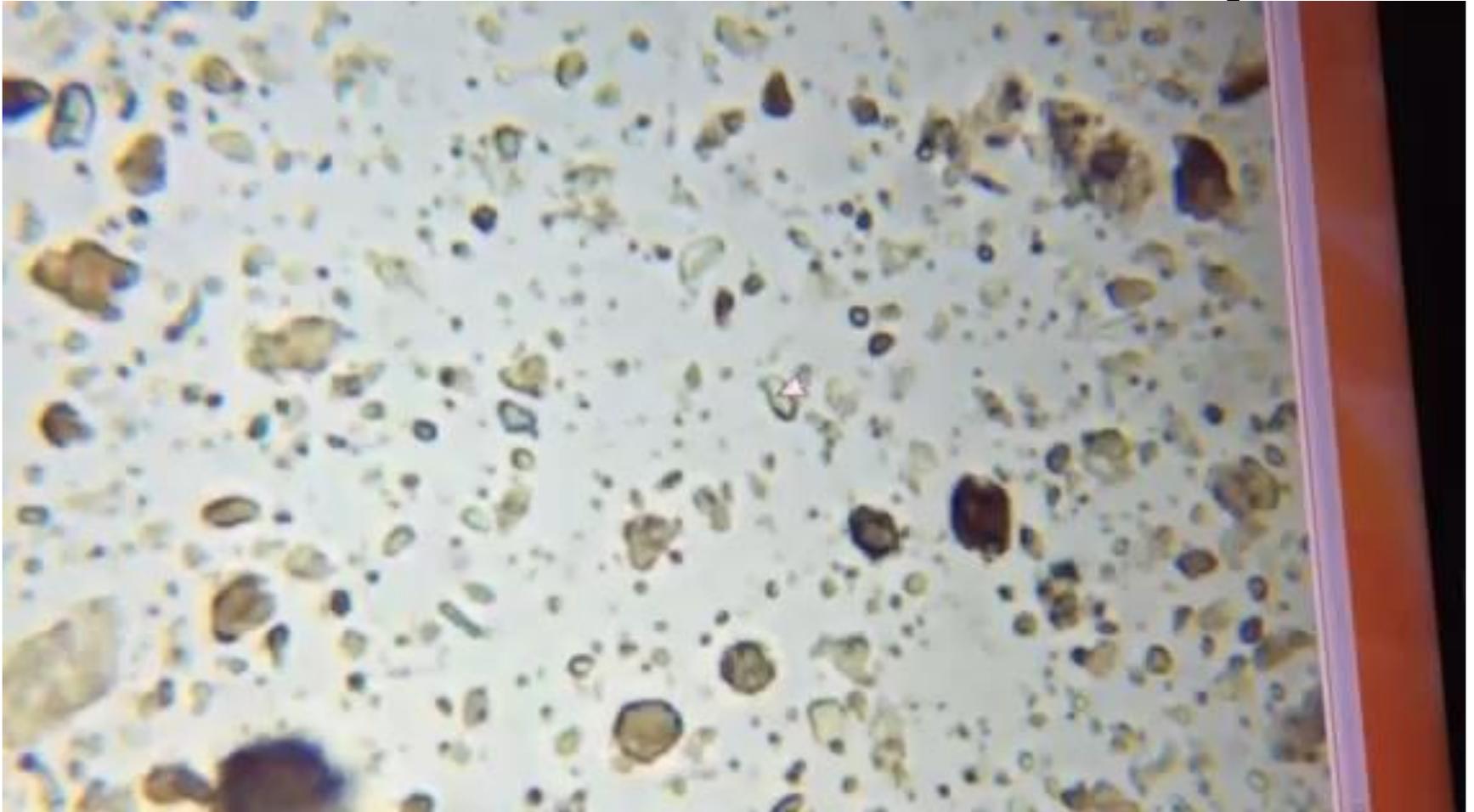
unlock the
SECRETS
IN THE
SOIL

A close-up photograph of a person's hand holding a light-colored wooden handle, possibly a tool, positioned over a patch of dark, rich, organic soil. The soil is covered with small twigs, dried leaves, and some green weeds. A brown boot is partially visible in the upper right corner. The overall scene suggests a focus on natural, organic gardening or agriculture.

**LET'S SEE WHAT KIND
OF LIFE IS LIVING
IN ORGANIC SOIL**



Gromulch Under Microscope





THERE ARE
4 main organisms
THAT MUST BE PRESENT
TO PROVIDE



all of the **NUTRIENTS**
and **PROTECTION**
NEEDED FOR



MAXIMUM

PLANT GROWTH



Bacteria

Nematodes



Fungi

Protozoa





So what
do they do?



MAGNIFIED 400X



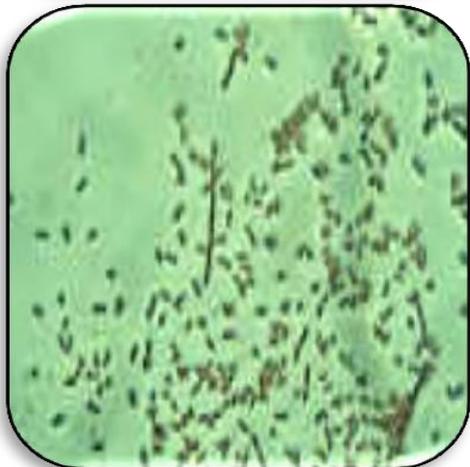
BACTERIA

EXCRETE NUTRIENTS AND
TURN ORGANIC MATTER
INTO FOOD FOR PLANTS

*KELLOGG GARDEN ORGANICS GARDEN SOIL



Bacteria



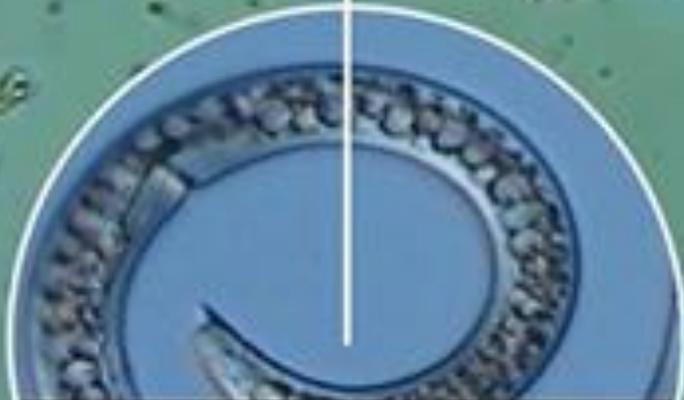
- Decomposes Organic Matter
- Nutrients locked in the bodies are cycled and consumed
- Suppress Disease
- Breakdown of hard to decompose compounds
- Starburst of Fertilizer for roots



Nematodes – Top of the Food Chain



- Control disease
- Cycle nutrients
- Disperse bacteria & fungi
- Predator for root-feeding nematode



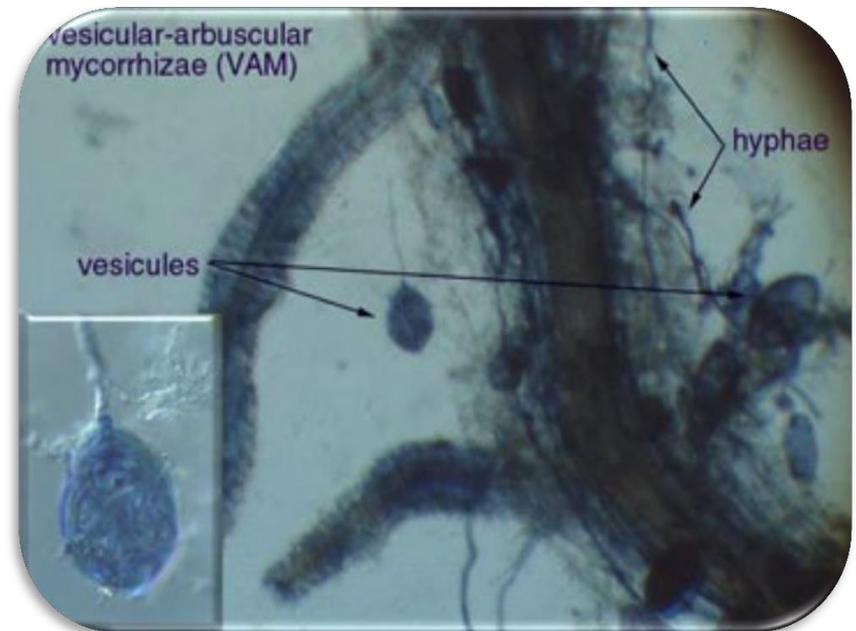
NEMATODE

PREDATOR THAT EATS BACTERIA
AND OTHER HARMFUL
NEMATODES



Fungi

- Decompose Organic Matter
- Glomalin secretion develops soil structure
- Extract nutrients
- Hold nutrients



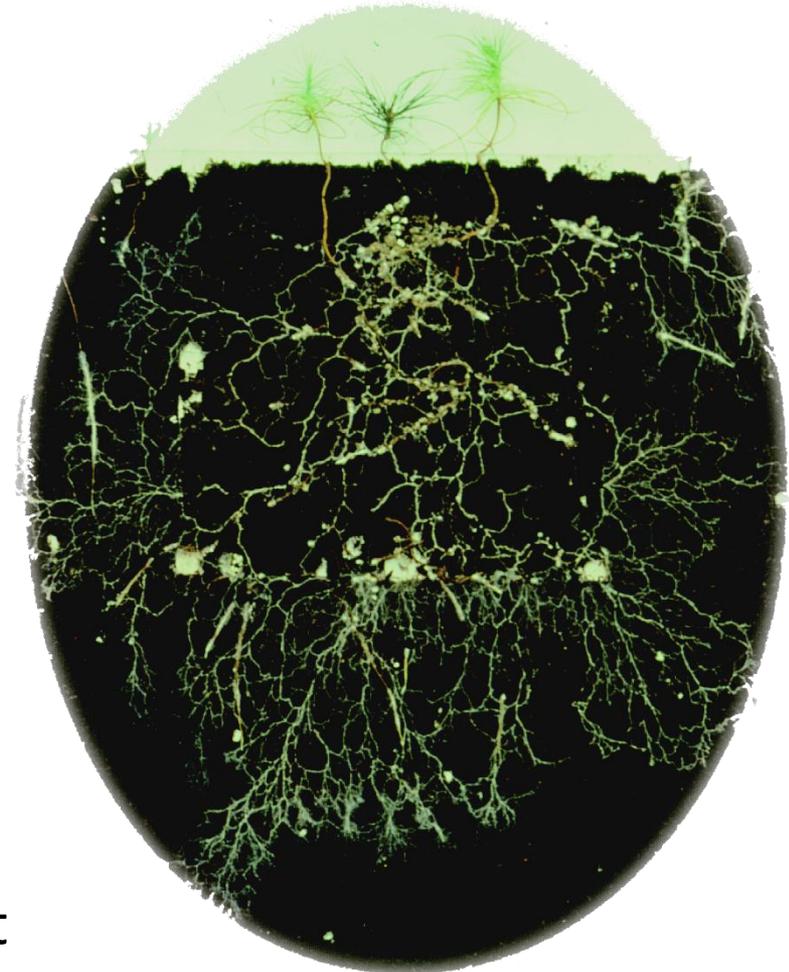


MYCORRHIZAE

Mycorrhizae are fungi that attach themselves to plant roots in a mutually beneficial relationship.

Benefits to plants:

- Expands the root mass of the plant by 100 to 1000 times
- Improves nutrient and water uptake
- Improves plant growth and yield
- Reduces transplant shock
- Reduces stress from salt and drought





Compost and the Rhizosphere

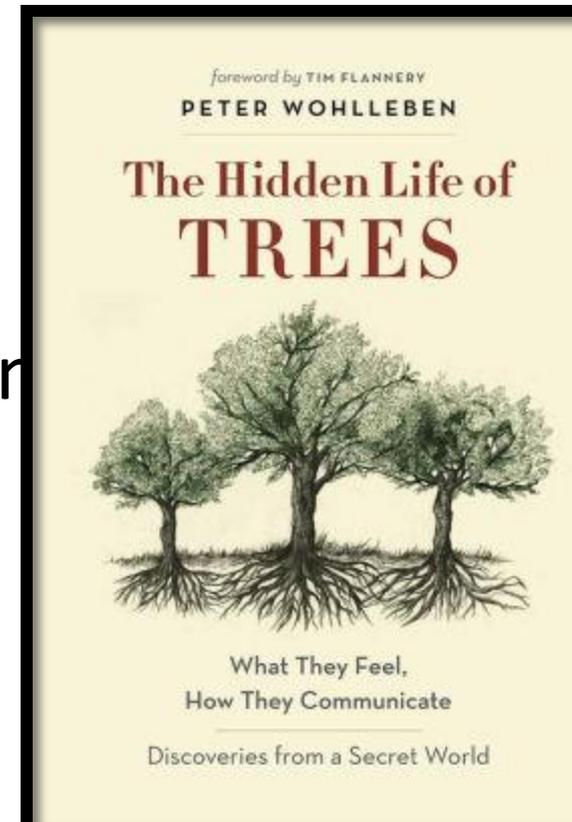


- Area immediately surrounding the plant roots
- Has the highest biological activity due to the high concentration of photosynthetically-derived carbon
- Has some of the greatest impact on soil structure
- Most impacted by aboveground management
- Living roots release exudates
- These compounds attract Bacteria that feed on the proteins and sugars
- Protozoa and Nematodes feed on the bacteria
- **Nutrient cycling & disease suppression start right here**



The Secret Life of Trees

- Arboreal Mutuality with fungi and roots
- Trees Communicate
- Complicated pheromones
- Protective toxins
- Distant Groves receive Information
- Amazing Life Under our Feet!





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Presents
JAMES CAMERON'S
AVATAR
Coming To Disney's Animal Kingdom





*Helping People Grow
Beautiful and Healthy Gardens...Organically
in the most environmentally responsible
and restorative manner ...*



When in doubt...just garden!



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At Kellogg Garden Products, *Organic* is more than a word on label. Building Life – In the Soil, In Waterways, and In Communities – is what *Organic* means to us. Every Kellogg Garden Organics and G&B Organics Soil and Fertilizer is OMRI Listed, compliant with the USDA's National Organic Program (NOP). *Organic Builds Life.*



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