

# Biodynamic Compost



- by Jesse Dodd
- Living Soil Specialist
- Excerpted from Power Point given on June 27 at Heartwood Institute



# Home Garden





# Break Down of Organic Materials

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# What good compost looks like



- Good color
- Good smell
- Moist, loose, crumbly
- Teaming w/ life

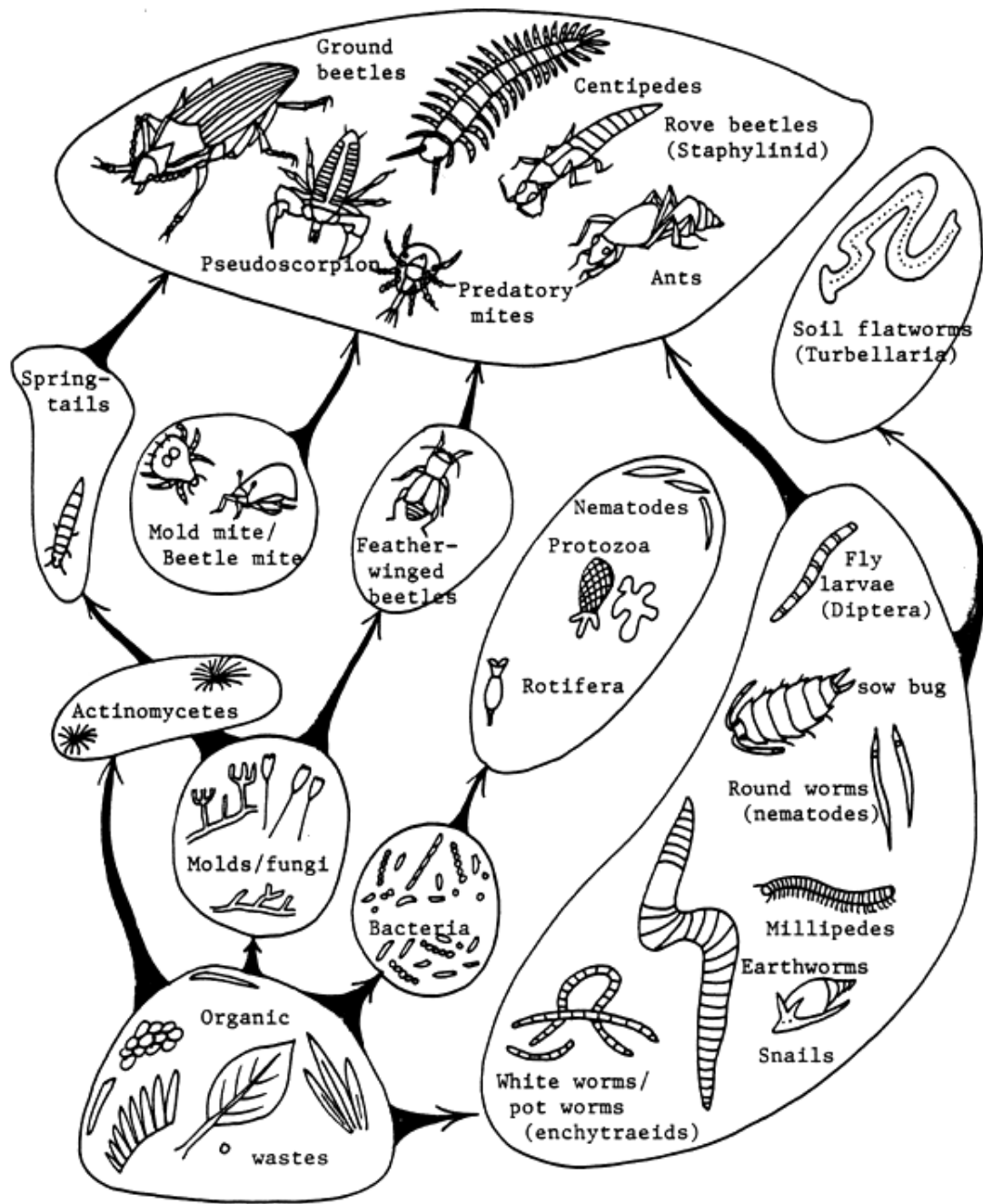




# Living Soil

- Plants evolved to derive nutrition from living soils
- Mutualistic symbiosis with microorganisms and animals
- Soil structure
- Water retention
- Biodiversity and remediation

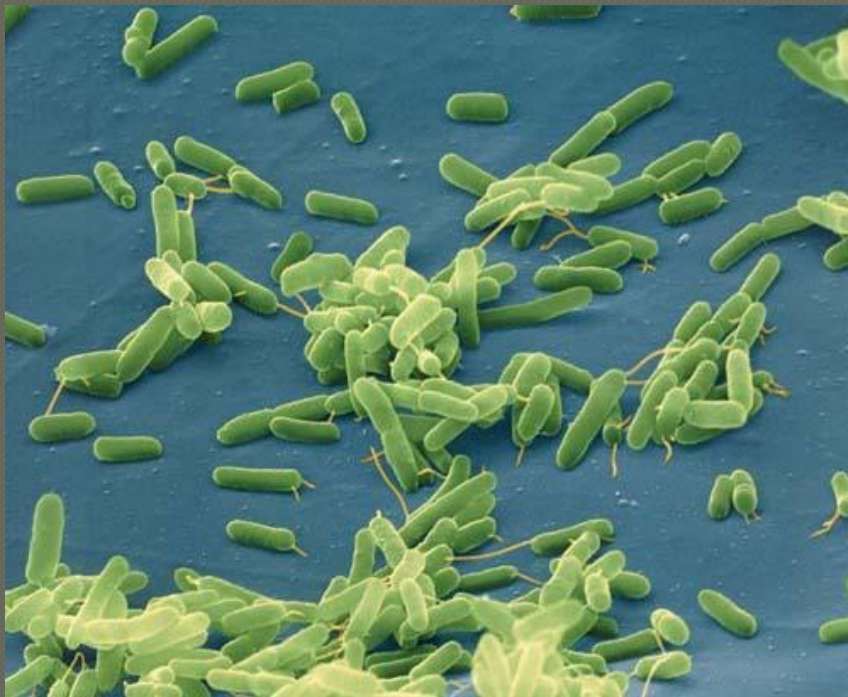




# Soil Food Web



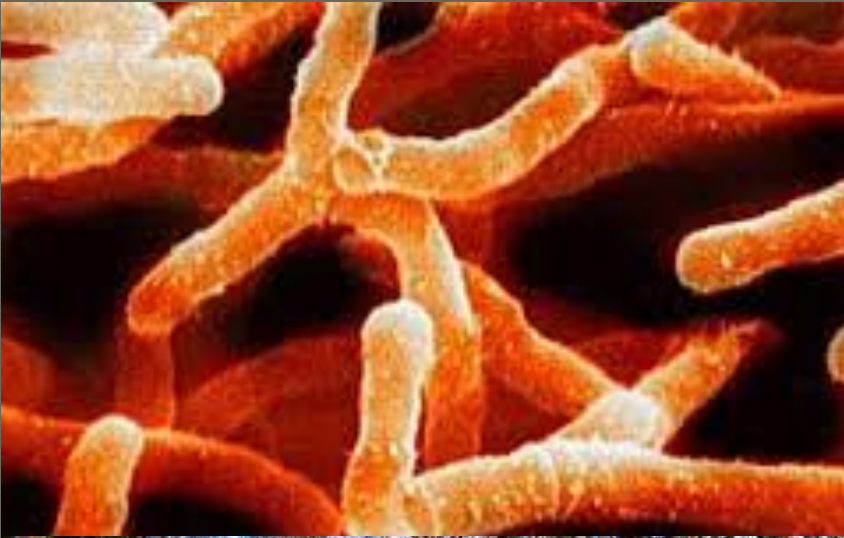
# Bacteria



- Able to break the bonds of large complex molecules creating smaller chains of sugars fatty and amino acids using enzymes
- Nitrogen fixing  
Azospirillum  
Azobactor  
Rhizobium



# Actinobacteria & Streptomyces

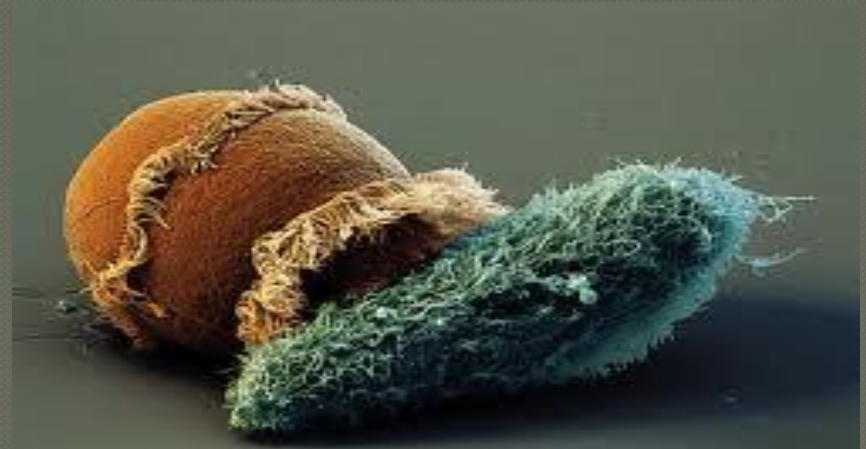


- Like Fungi with chitin rich filament network similar to fungal hyphae
- Lack nucleus like bacteria
- Responsible for the good earth smell of soil



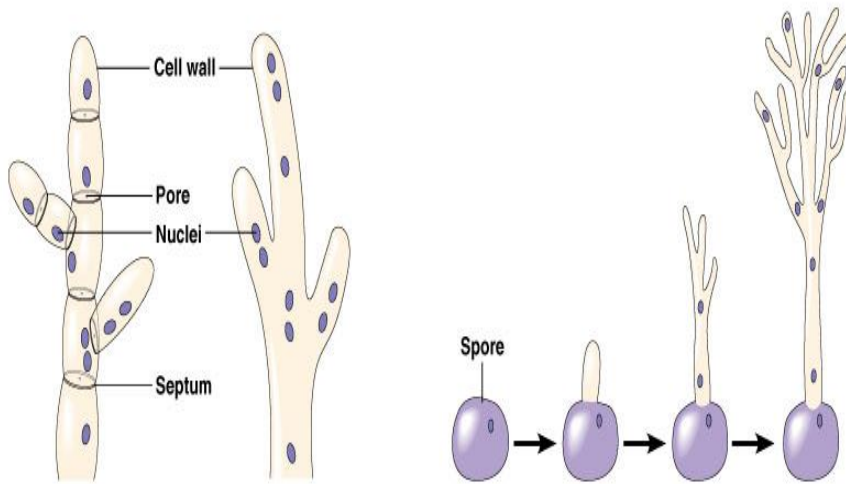
# Protozoa

- Eat Bacteria and Fungi
- Mineralizers : Making nutritional compound plant available ( $\text{NH}_4^+$ )
- Up to 80% of the N a plant needs come from the waste of Fungi and Bacteria eating Protozoa





# Fungi



(a) Septate hypha

(b) Coenocytic hypha

(c) Growth of a hypha from a spore



# Insects have a roll in breakdown and movement of nutrients and life

- ◉ Mites
- ◉ Millipedes
- ◉ Centipedes
- ◉ Snail & Slugs
- ◉ Spiders
- ◉ Springtails
- ◉ Beetles
- ◉ Ants
- ◉ Flies









# Compost is Life

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- Compost is the instrument of infinite renewal of life and the fuel in which all organisms thrive in a mutualistic (beneficial symbiosis) flow of nutrients. It is the eternal Phoenix of life rising from the ashes of decay. Without the renewal compost all life on earth is finite destined to decline in health in an inevitable path of entropy and death without return.



ORGANIC WASTE  
SHOULD BE RETURNED  
TO LIVING SOIL



# Compost

- **REDUCES**
  - TRANSPORTATION OF MATERIALS
  - SPACE USED IN LAND FILLS
  - LOSS OF LIVING SOIL
  - NEED FOR PURCHASE OF SOIL AND NUTRIENTS
  - USE OF CHEMICAL FERTILIZERS AND PESTICIDES
  - RUN OFF OF POLLUTANTS LIKE NITRATES AND PHOSPHATES
  - WATER USE
- **INCREASES**
  - HEALTH AND QUALITY OF FOOD AND MEDICINE
  - VALUE OF AND PRODUCTIVITY OF LAND
  - BIODIVERSITY AND REMEDIATION



# Materials

BROWN

100-500:1 C:N RATIO

LIGNIN, FIBERS & TANNIN

FUNGI FOOD

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GREEN

20:1 C:N

SUGARS, N & CELLULOSE

BACTERIAL FOOD

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# Home Compost Design



- Can eat most kitchen waste and paper waste
- No meat or dairy
- Avoid spicy or overly acidic material
- Materials need to break down before becoming available as plant food
- Like dark moderate conditions

# Larger Compost Structure: Air Tunnels a Key to Success



- Building air tunnels increase availability of oxygen for aerobic microbes
- Reduces the need to turn. Allows the biology to thrive undisturbed
- Provides structure to deal with weather



# Temperature



- The microbes that decompose raw organic material fall into basically two categories:
- Mesophilic  
50° - 113°F (10° - 45°C)
- Thermophilic  
113° - 158°F (45° - 70°C)

# Water



- Keep it wet - microbial break down requires water
- Avoid over saturation, compaction and anaerobic pockets
- Take care of the ends and sides and the middle will take care of itself



# Earth Worms



- Shedders
- Castings are 50% higher in organic material
- Bacteria in worm intestines unlock chemical bonds, freeing up plant available nutrients
- 10xK, 7xP, 5xN, 3xMg, 1.5xCa in fecal pellet
- Improve soil structure

# Composters Can Be Food: King Stropharia Mushrooms

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- Stropharia rugosoannulata. king stropharia the gardengiant ready to eat. After feeding building and protecting my garden, they feed me. Super tasty too!





- Stropharia eating some wood chips breaking down material into plant available forms as it adds soil structure and releases CO<sub>2</sub>. It is also known to kill E. Coli. and can be used as a bio filter.











# Applying Compost

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# Applying Compost Top Mulch





# Increased Health and Nutrition

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**Stressed**



**Good Health**



# Have Fun Gardening with Compost!













