

# COMPOSTING FOR HOME GARDENS

Old Saybrook Conservation Commission & Acton Public Library

10 July 2023

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# Agenda

- Composting vocabulary: What *is* compost?
- Why compost?
- What is ‘home composting?’
- How can home gardener’s compost?
- What concerns and challenges confront home composters?
- Worm bin demonstration.

# Composting Vocabulary

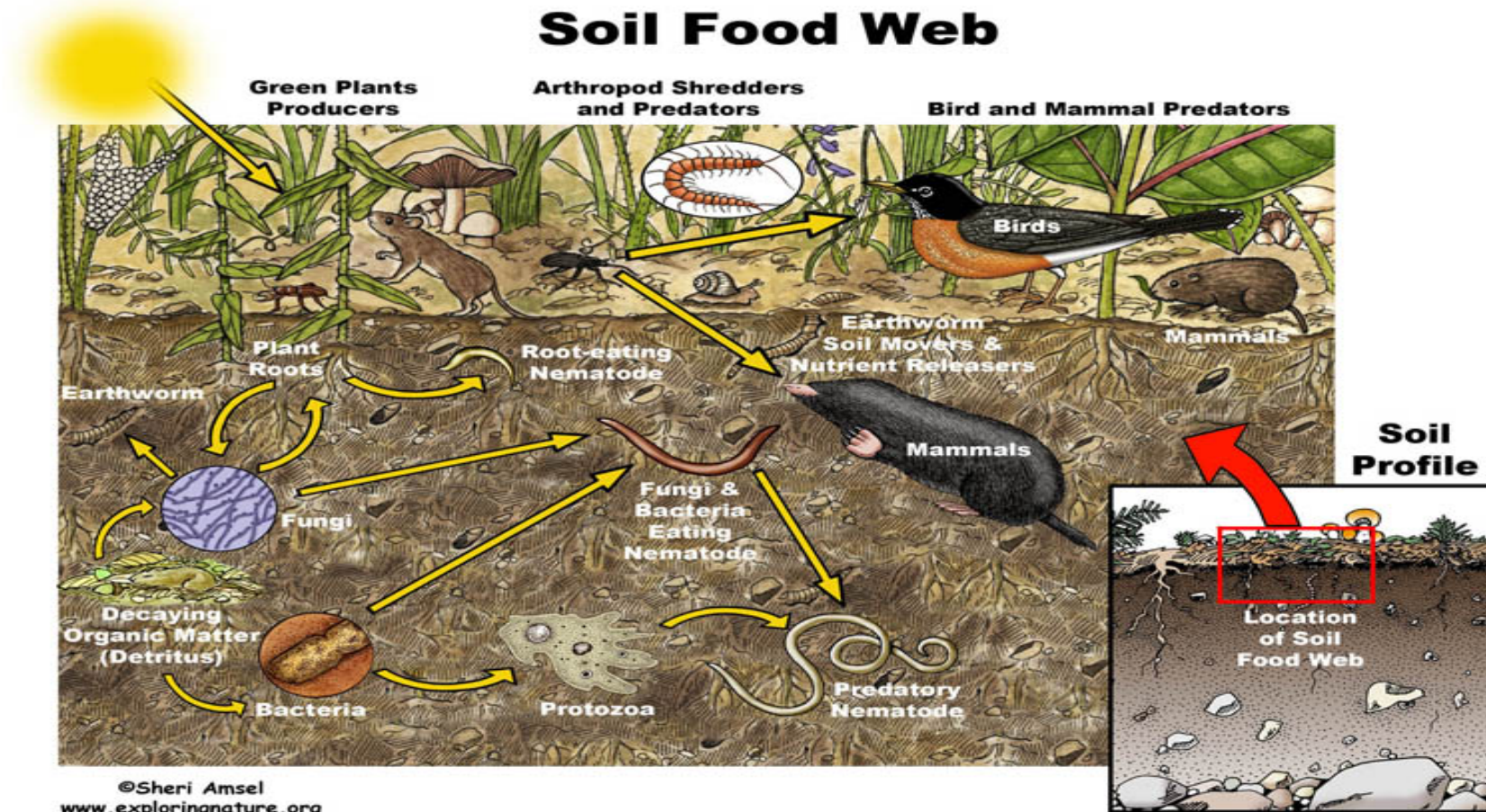
- Compost: *organic matter purposely decomposed by a gardener employing natural processes by providing adequate:*
  - *Carbon and Nitrogen rich ingredients in the right ratio (C:N 20 – 30:1; i.e. 10 inches of leaves to 2 or 3 inches of grass clippings)*
  - *Air*
  - *Water*
  - *Warmth*
  - *Microbes (organisms too small to see unaided)*
- Organic Matter: *plant or animal material in the soil.*
- Humus: *naturally decomposed organic matter; an earth-like substance that highly benefits plant growth and can improve any soil texture (sand, silt or clay).*
- Soil: *large, dynamic, fragile, living system.*
- Soil Food Web: *soil community of decomposers including bacteria, fungi, insects and worms.*
- ‘Healthy’ soil: *45% mineral; 25% air; 25% water; 5% organic matter.*

# Healthy Soil Has Many Benefits





# Healthy Soil is Produced By The Soil Food Web – Inhabitants of the Fragile Layer of Top Soil



# Why Compost?

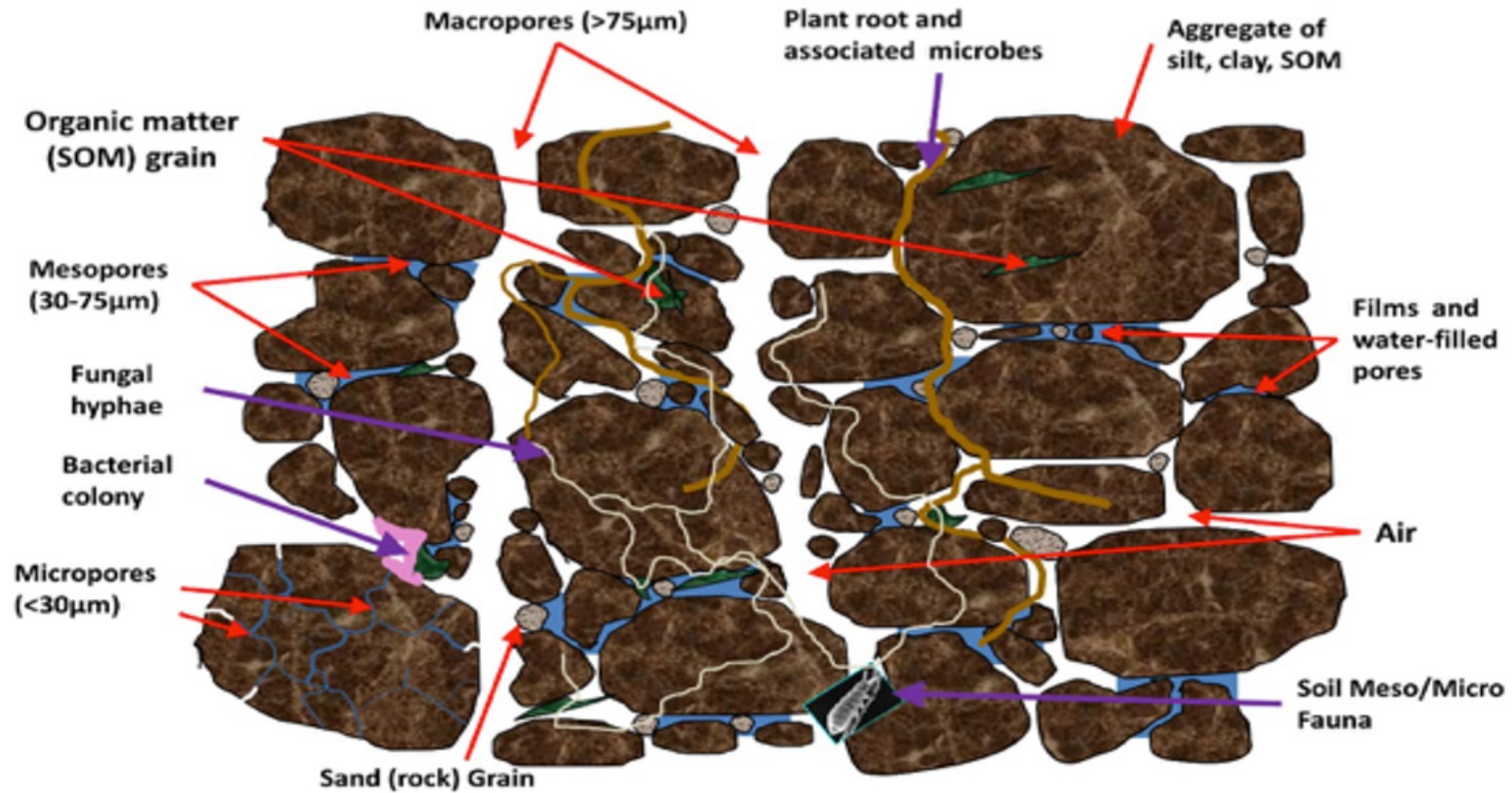
- Home gardeners usually compost to produce humus. Compost is nominally about 80% humus but it is unstable.
- Humus benefits garden soil, the garden's foundation, structurally, chemically and biologically. So, humus is good for plant soil.
- Compost used as mulch helps protect soil and plants by mitigating environmental impacts.
- Composting benefits our environment – less waste transported to landfills and incinerators and by promoting microbe growth. Microbes store carbon produced by photosynthesis.
- However, compost is not fertilizer. Gardeners need to test their soil and follow the report's recommendations to grow healthy plants.

# How Humus Helps Plant Soil

- **Physically:** Humus binds with soil to create aggregates (peds). Peds create soil spaces for air, water and roots in any soil texture. It promotes porous soil.
- **Chemically:** Compost includes humic and fulvic acids. Negatively charged humic acids chemically bind positively charged soil macro and micro nutrients, including potassium, calcium, and magnesium. This improves nutrient availability.
- **Biologically:** Non-humic compost components facilitate plant and micro organism growth by, in part, providing carbon, nitrogen and phosphorous. Auxins and other plant growth regulators can also be affected. However, these benefits are threatened by aggressive tilling.



# Healthy Garden Soil is Porous





# What is Home Composting?

- Composting is based on the natural biological and chemical reduction of organic wastes. This occurs constantly when living things die in the presence of air, water and microbes. Our assistance is not required.
- Home composting employs these natural reduction processes to consume domestic organic wastes – usually a selected mix of yard and kitchen wastes.
- Gardeners assist natural decomposition by creating and controlling a micro environment that fosters a robust food web.
- Compost materials that will attract nuisance critters, spread disease or invasive plants are avoided particularly invasive plants with seed heads, stolons or rhizomes - e.g. Japanese knotweed, Goutweed, Canada thistle.

# Composting at Home

- Three composting methods: Hot, cold and worm
- **Hot:** Create a pile, preferably within a 4'x4'x4' structure and lid for containing a mix of carbon and nitrogen rich organic materials. Pile will get hot (120 – 150 F) and then cool. Compost results in 2 – 4 months.
- **Cold:** For the energetic, dig three pits 4' square and 2' deep. Start in spring, fill with successive layers of 'browns', 'greens', and soil. Dig a second in summer and the third in the fall as the pits fill a foot or so above the ground. Next spring into summer harvest the first pit and repeat. (Beyers, p. 46) Alternatively, just make a pile and turn, occasionally!
- **Worm:** Create a worm bin with moist bedding, composting worms and food scraps. Worm castings are digested soil. They are ready to use right from the worm box. No composting is necessary. Start with a pound of 'red wigglers' *Eisenia fetida*.

# Promoting Microbial Decomposition

- An initial C:N Ratio of 20-30:1 is ideal for microbial decomposition.
- Bacteria and other microorganisms naturally appearing in organic matter break down the C and N particles into inorganic forms.
- To ensure that you have microorganisms in your pile, add a shovelful of soil or finished compost.
- One cup of soil contains an abundant decomposer community:
  - 200 billion bacteria
  - 20 million protozoa
  - 100,000 nematodes
  - 100,000 meters of fungal hyphae

# Avoid Composting...

- All dairy products (including milk, cheese, butter, yogurt)
- Meat & fish scraps (including all meat products, grease, bones)
- Fats, oils, salad dressing
- Pet feces
- Diseased plant material
- Coal, wood or charcoal ashes, limestone
- Glossy or color magazines and newspapers
- Pesticide treated plant material
- Herbicide treated grass clippings
- Invasive weeds



# Composting Concerns and Challenges

- Concerns
  - Odors: ammonia, rotten eggs etc.
  - Attractive nuisance – bugs, bears etc.
  - Consumes lots of time and space (depends on the method)
- Challenges
  - Odors – turn the pile and add carbon rich materials
  - Attractive nuisances - Bury food vegie scraps 12” (avoid meat, dairy, fish, pet food & wastes)
  - Getting the mix of carbon and nitrogen rich materials right may take some adjusting– C:N 20-30:1 (10” leaves to 2 – 3” clean grass clippings plus a shovel of soil)

# Worm Bin Demonstration

- Bin
  - Opaque plastic box about 16"x24"x8" with lid
  - Drill 15 to 20 ¼" holes around, bottom and top for air and drainage
  - A second container to set the bin in – a foil turkey pan works well
- Bedding
  - Shredded newspaper without glossy sections, paper bags
  - Enough to fill bin about ½
  - Moisten bedding with water to wet sponge consistency
- Worms
  - to start about 1# of 'red wigglers' *Eisenia fetida*. NOTE: Use the scientific name when ordering worms for composting.
  - Contact UConn Soil Nutrient Lab at (860) 486-4562 or UConn Extension Middlesex County in Haddam (860) 345-4511 for more information.
- Kitchen Waste – Most works, avoid meat, dairy, citrus, animal food and waste. Wigglers have a 'sweet tooth.' They love melon rinds.
- Location –
  - Warm (55 – 85, 70 is best)
  - Kitchen, basement, bathroom, closet

# Resources

- Beyers, Daryl. *The New Gardener's Handbook*. 2020. Timber Press. Portland, Ore. The soil chapter, pp 31 – 51, is especially informative.
- Gershuny, Grace and Deborah L. Martin, Editors. *The Rodale Book of Composting*. 2018. Hearst Magazines, Inc. New York.
- University and Government Web Sites: Preface search terms with site:.gov or site:.edu to prioritize search results from more reliable government and university sources. Avoid .com sites. Some .org sites are okay, but not all.
- Contact UConn, <http://www.soiltesting.cahn.uconn.edu> for fact sheets.
- Cornell University, the University of Minnesota and North Dakota State Extensions offer informative composting sites. NC State Extension has a useful worm composting site.