



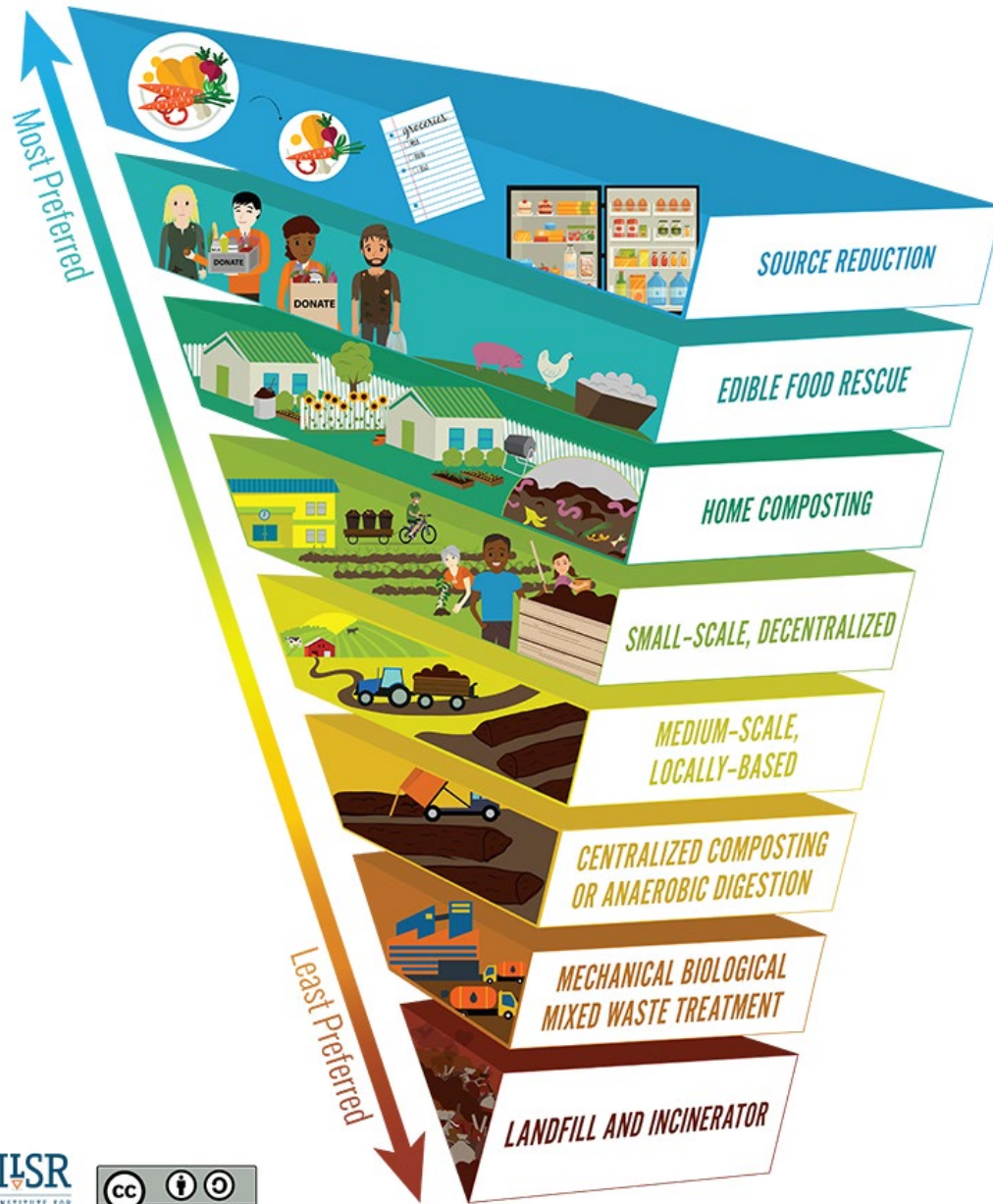
Building Soil in Urban Environments

PATHWAYS TO SMALL VOLUME FOOD SCRAP MANAGEMENT



Food Waste Reduction

USA's 2030 Goal



- There are many approaches to solving to **food waste** issues. The approach in this presentation stresses local resilience & community connection.
 - The figure shows **Institute for Local Self-Reliance's** Food Scrap Recovery Hierarchy.
 - After source reduction, food rescue, and home composting, (*not easy for most city dwellers*) *small scale decentralized composting* is recommended
 - Other sources, such as **ReFED**, privilege *Centralized Composting Methods* over small scale
 - The **EPA's Food Waste Hierarchy** privileges *Industrial Uses*

Compost

The return of **organic materials** to a rich, stable, humus-like material through a managed **aerated process of decomposition** that is mediated by **microbe metabolism**.



Why Compost?

Operational Benefits: Connection & Resilience

- Helps integrate your farm operations within your community.
 - Depending upon your collection strategy you will become a resource to your business and residential community
- Helps a farm's bottom line.
 - Less soil and fertilizer requirements
 - Compost collection programs can add a source of revenue to your operation

Environmental Benefits: Closing the Loop

- Compost generates top-soil
 - Necessary for food production, carbon capture, & water filtration.
- Conventional farming practices have severely depleted top-soil
 - Conventional farming practices have severely depleted the soil. In the US some estimates report that soil on cropland is eroding 10 times faster than it can be replenished.





Compost Operation Fundamentals

The fundamentals of composting are the same on every volume level:

- Food scraps and organic wastes are **generated**, **collected**, **composted** and then **returned** to the soil.

-GENERATION-	-COLLECTION-	-COMPOSTING-	--RETURN--
Where are scraps coming from?	How will they be collected and brought to your site?	What state/local regulation?	On farm use or for sale?
<i>Farm</i> <i>B2B</i> <i>Residential</i>	<i>Drop off</i> <i>Pick Up</i> <i>Collection/Cleaning</i>	<i>What System?</i> <i>What Volume?</i> <i>Own or lease?</i>	<i>Testing req's for sale/</i> <i>Off-site use</i>



State and Local Regulation

- **United State Composting Council** (USCC) has an extensive list of regulations per state on their website.
 - This is a FANTASTIC place to start. I highly recommend becoming a member if you are interested in developing a composting operation on your site.
 - There are also **USCC State Chapters**. You can check if your state has one and contact them for recommendations.



<https://www.compostingcouncil.org/page/StateRegulations>

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GENERATION: Sources of Food Waste

Pre-Consumer 'Scraps'

- Usually 'cleaner' comes as scraps from kitchens.
- More predictable nutrient profile
 - Commercial Kitchens
 - School Kitchens
 - Inedible produce from community pantries
 - Café's & Restaurants
 - Waste Products from specialty businesses like juicers, roasters, caterers, etc

Post-Consumer 'Scraps'

- Post consumer waste is difficult to manage. It must be monitored for contaminants.
- Less predictable nutrient profiles.
 - School Cafeteria's
 - Residential Programs

New EPA Tool: Excess Food Opportunities Map!

- Interactive Map that identifies 1.2 million potential food waste generators & recipients across the nation in industrial, commercial, and institutional sectors.
- <https://www.epa.gov/sustainable-management-food/excess-food-opportunities-map>

COLLECTION

- Commercial/
Residential
- Drop off/Pick up?
- Methodology
 - Make a clear procedure for WHAT you will accept and the CONTAINER it comes to you in

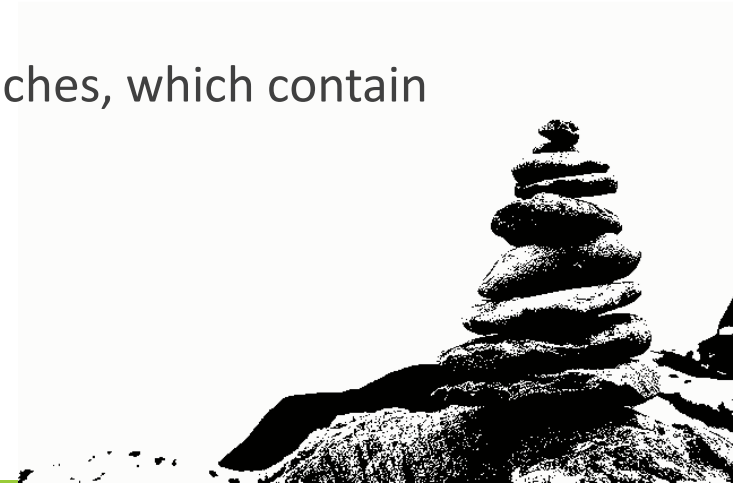




COMPOSTING: The Process

- Feedstock and Nutrient Balance

- Your available feedstocks must be a balance of nitrogen and carbon: “green” organic materials and “brown” organic materials. It takes time to understand the right mix for the right processes.
 - “Green” organic material includes grass clippings, food scraps, and manure, which contain large amounts of nitrogen.
 - “Brown” organic materials includes dry leaves, wood chips, and branches, which contain large amounts of carbon but little nitrogen.





COMPOSTING: The Process

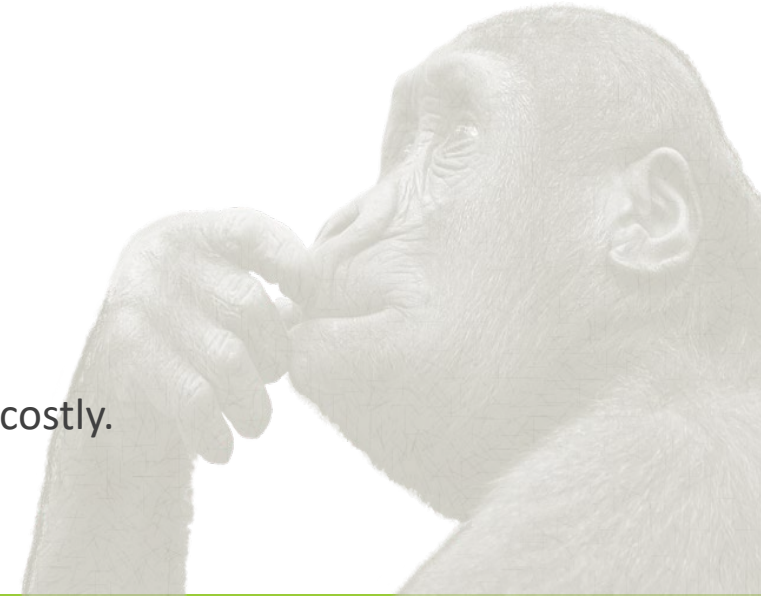
- Other considerations: Particle Size, Moisture Content, Oxygen Flow & Temperature
 - **Uniform particles** help compost homogeneity.
 - Microorganisms need **moisture** to survive, thrive, and do their jobs. Moisture can come from rainfall or intentional watering, as needed.
 - **Oxygen** allows decomposition to occur at faster rates, just watch out for over-drying.
 - **Temperatures** must be monitored. If the temperature doesn't increase anaerobic conditions can occur.
 - **Pathogens killed: 131 F**
 - **Weed seeds destroyed: 144 F**





COMPOSTING: Choosing a System

- Volume of Food Scraps – **State and local regs.**
 - How much food waste can you legally and operationally manage
- Access to capital – **State & local regs.**
 - Some systems are incredibly costly. What tools do you already have on your farm?
- Land access – **State & local regs.**
 - Do you own or do you lease?
 - How large is your land?
 - How close are your neighbors?
- Use - **State & local regs.**
 - On farm only or for sale?
 - Sale or off site:
 - REGULATED TESTING, WITH SPECIFIC REGISTERED LABS OFTEN REQUIRED, can be costly.



COMPOSTING: Systems & Terminology

Aerobic

- Bin systems*
- Aerated Static Pile*
- Windrow*
- Vermicomposting*
- In-Vessel

Anaerobic

- *Bokashi*
- *In-Vessel*



COMPOSTING:

Small Scale & Micro Composting



- 3+ Bin System
 - Materials pass from bin to bin as they are turned and managed. The final bin is for curing and storage.
 - Level surface
 - Lid system
 - Wooden Slats
 - Lock-able to prevent contamination



COMPOSTING:

Windrow

- **Windrow composting** is the production of **compost** by piling organic matter or biodegradable waste, such as animal manure and crop residues, in long rows (**windrows**). This method is suited to producing large volumes of **compost**.



Additional Resources



- Book: **Community Scale Composting Systems** by James McSweeney
 - Great technical overview, highly comprehensive. A must have!
- Institute for Local Self-Reliance: <https://ilsr.org/composting/>
- US Composting Council: <https://www.compostingcouncil.org/>
- ReFED:
 - Heavily data driven food waste reduction strategy recommendations
 - <https://www.refed.com>
- EPA:
 - Composting basics:
 - <https://www.epa.gov/sustainable-management-food/types-composting-and-understanding-process>
 - Food waste opportunities map:
 - <https://www.epa.gov/sustainable-management-food/excess-food-opportunities-map>

Thank you!

Contact

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