Community Composting Success
a two-part webinar series brought to you by the Northeast Recycling Council

PART 2: Best Management Practices for Community Composting
Today’s Presenters

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Composting Association of Vermont

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Lakes Region Planning Commission
What Will Be Covered in Part 1:
What can science tell us about composting and the virus that causes COVID-19? What do we as composters need to know to control the disease and prevent it from spreading? In this webinar we will review safe handling procedures and meeting pathogen reduction standards (PFRP) at compost sites.
Community Composting

- Produces compost for local use
- Promotes community connections
- Includes network of backyard composter
- Builds resident food waste management awareness & participation
- Can play an essential role in the evolution of food scrap diversion, especially in small town/rural areas

Photo: Abby Foulk with student volunteers at Charlotte Central School, Charlotte, VT. Cr.: VCGN
Community Composting

- Often volunteer run; some staffed
- Garden groups, neighborhoods, nonprofit organizations, public sector, farms, schools, businesses, housing complexes...
- Range of sizes: 10-20,000 sq.ft.
- Range of compost systems
Composting Science: The Basics

OR - how to be a good decomposer manager...

Regardless of scale, the composting process is the same
What is Composting?

- Controlled, aerobic biological process
- Microorganisms are the key
- Recycles organic matter
- Converts residue material into a valuable product rich in organic matter and organisms

Credit: Puzzle Permaculture
It’s all about the Decomposers!

Raw materials
- Organic matter - including carbon, chemical energy, protein and nitrogen
- Mineral nutrients - including nitrogen and other elements
- Water
- Microorganisms

Process
- Water
- Heat
- CO₂

Product
- Finished compost containing organic matter - including carbon, chemical energy, nitrogen, protein, humus, mineral nutrients, water and microorganisms

Recycled Organics University
www.recycledorganics.com
What is Compost?

- Stable, soil/humus-like material
- Rich in organic matter & organisms
- Free of unpleasant odors
- Easy to handle
- Can be stored for long periods
- Valuable soil & potting media amendment
Keeping Microbes Happy

Setting up the right environment and conditions is fundamental to the process:

- **Carbon:** “Brown” materials (wood shavings, leaves, soiled/shredded paper, straw, animal bedding)
- **Nitrogen:** “Green” materials (kitchen scraps, grass clippings, garden trimmings, manures)
- **An initial boost:** a little soil, finished compost, or horse manure
- **Moisture:** required to keep microorganisms alive & active, like a damp sponge
- **Keep the material small:** mowing, grinding, chipping, or shredding
Keeping Microbes Happy - the science

- **Aeration:** Oxygen concentrations: 10-14+%  
- **Carbon to Nitrogen (C:N) Ratio:**  
  - 20:1 - 60:1  
  - Preferred 30:1-50:1
- **Moisture:** 40 to 65 percent (like a damp sponge)
- **Optimum pH range:** 5.5 to 8
- **Temperature:** 90°-150°F (32°-66°C)  
  - If all is well with your pile, temperatures will rise!  
  - Process to Further Reduce Pathogens: 131°F for 3-15 days (f of system)
### Sample Carbon & Nitrogen Ratios of Various Organics

<table>
<thead>
<tr>
<th>Carbon Sources</th>
<th>Carbon:Nitrogen Ratio</th>
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<tbody>
<tr>
<td>Yard wastes</td>
<td>50 - 90:1</td>
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<tr>
<td>Straw/hay</td>
<td>50 - 80:1</td>
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<tr>
<td>Wood chips/sawdust</td>
<td>250 - 500:1</td>
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<table>
<thead>
<tr>
<th>Nitrogen Sources</th>
<th>Carbon:Nitrogen Ratio</th>
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<tr>
<td>Vegetable scraps</td>
<td>10 – 30:1</td>
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<tr>
<td>Fruit scraps</td>
<td>10 – 30:1</td>
</tr>
<tr>
<td>Grass &amp; garden gleanings</td>
<td>10 – 20:1</td>
</tr>
<tr>
<td>Chicken manure</td>
<td>10 – 25:1</td>
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<tr>
<td>Cow manure</td>
<td>20 – 30:1</td>
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<tr>
<td>Horse manure</td>
<td>25 – 30:1</td>
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Simple & “Slow” Method

- Follow the basic recipe (1 green to 3 browns)
- Turn occasionally
- Compost will be ready in 12-18 months
Active ("Hot" Compost) Method

- Enclosed containers
  - Insulate in winter
  - Use larger containers or tumblers/covered piles to insulate
- Proper “mix” of green & brown feedstocks (for system)
- Frequent turning of materials to achieve heat
  - 1-2 times per week
- Temperature should rise to 90-120°F for 3+ days - (131°F is goal)
- Finished compost in 6-8 months
Feedstocks & Recipe Development

What’s your site goal?
How much volume can your site handle?
How much volume can your team handle?
Acceptable Materials

- Fruit & vegetable scraps, peels
- Bread/pastries, pasta, rice, beans
- Nuts & nut shells
- Coffee grounds/filters & tea bags
- Sawdust
- Leaves, yard/garden trimmings
- Napkins, paper towels
- Livestock bedding/manure
- Straw
GREENS Sourcing: Food Scraps

- Community gardeners
- Schools
- Businesses
- Residential complex
- Churches
- Community members
- Grocers** (be selective)

• Start collecting small volumes, grow from there
• Year-round, consistent supply of feedstocks
BROWNS Sourcing: Carbon

- Woodworkers, town, utility crews, landscapers - sawdust, wood shavings
- Neighborhood, landscapers - leaves
- Farmers - livestock bedding

- Year-round, consistent supply!
- 2-3 times volume than food scraps
- Keep dry
Community Collection...by bike!

Pedal People
Northampton, Massachusetts
High Carbon 3 volumes

BASIC RECIPE

High Nitrogen 1 volume
Site & System Considerations
(Before) Gathering Needed Materials

• Permitting & regulatory considerations
• Land: How much space do you need?
• People power: What’s your capacity to collect and process materials?
(Before) Gathering Needed Materials

• Decide on types of feedstocks
• Assess volume of materials needed (Greens : Browns)
• Identify resources available
• Develop a plan
Site Plan: Going with the Flow

1. Organics Intake
2. Feedstock Preparation
3. Active Composting
4. Curing
5. Sifting
6. Finished Compost/Distribution
Site Considerations

- Year-round accessibility
- Shrubbery, fencing, or cover
  - Blocks wind, insulation (for winter), & aesthetics
- Shady/partial sun is best
- Access to a water source
Site Considerations

- Buffer, swale, or filter around/behind piles
- Capture leachate
- Site bins/piles on ground, grass or vegetated area
- Slightly sloped (2-5%) for windrows & piles
Set-Backs

• 3 ft. from side lot lines; 10 ft. from front lot line; 25 ft. from the back lot line
• Adequate distance from well, wetlands, surface water bodies & flood plains
• Operate to prevent drainage from compost piles into water or neighboring property
• Keep area visually appealing
Best Management Practices: Siting

• Operated to minimize odors, prevent run-off, and not harbor or attract wildlife
• Screened from view from public & adjacent neighbors using plants, trellis, or fencing
• A neat site appearance is important
• Have an adequate amount of carbon on hand
  ✓ Always cover food scraps with carbon (sawdust/shavings) or soil
Best Management Practices: Animals

- Cover food scraps with adequate carbon or soil
- Line bins with hardware cloth (wire mesh)
- Cover with lime if issues with fruit flies & wildlife (rodents, bears)
- Enclose compost area if needed
- Repellents - noise, ammonia soaked rags
- Remove all food sources (bird feeders, trash cans) from area
- Stop incorporating food scraps in spring, if necessary
Community Compost Systems

What’s right for your site?
Tumblers
Bins
Bins

Photo Cr.: George McDonald, Maine DEP

Roof
Piles & Windrows

Images Cr.: David Hurd, GrowNYC
In-Vessel

The Dirt Factory, University City, PA

Image Cr.: PlanPhily
Vermicompost (Worms)
Insulated Systems
Champlain Valley Cohousing, Charlotte, VT
Integrated Systems
Process Management

Local case study examples
Tuftonboro Community Garden, NH

Images: Athena Lee Bradley, WSWMD
Tuftonboro Community Garden - Con’t

Fall/Winterized Compost Site
YMCA Camps (Tuftonboro)

2019 Pilot Program:
North Woods/Pleasant Valley Camp
- Kitchen scraps (pre-consumer)
- No meat or dairy

Initial setup at NW/PV camp
Feb. 2019 YMCA Camp Summit
FUTURE DEVELOPMENT GOALS:

- Use in-vessel composting to increase capacity
- Extend to larger Tuftonboro community
- Help the environment
Record Keeping Essentials

Why is it important to keep track of your compost program/system?
<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Composter Name(s)</th>
<th>Moisture Rating</th>
<th>Odor Rating</th>
<th>Temp 1</th>
<th>Temp 2</th>
<th>Turned (Y/N)</th>
<th>Other Actions Taken</th>
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### Log example:

**NW/PV camp pilot inputs and outputs**

Tracks...

- tumbler use
- quantity of material added
- volume reduction

<table>
<thead>
<tr>
<th>Compost Tumber Batch</th>
<th>Tumber Chamber</th>
<th>Date Added to Tumbler</th>
<th>Date Removed From Tumbler</th>
<th>Volume of Kitchen Scraps</th>
<th>Volume of Manure</th>
<th>Volume of Shredded Leaves</th>
<th>Volume of Other Additions</th>
<th>Other Addition Type</th>
<th>Total Volume Added to Tumbler</th>
<th>Volume of Material Removed From Tumbler</th>
<th>Comments</th>
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<td>6/29/2019</td>
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<td>3.0</td>
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<td>31.0</td>
<td>12</td>
<td>From 9/7 kitchen scraps</td>
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<td>Jora #2</td>
<td>9/16/2019</td>
<td>9/16/2019</td>
<td>18.0</td>
<td>3.0</td>
<td>3.0</td>
<td>3.0</td>
<td>Garden Loam</td>
<td>31.0</td>
<td>12</td>
<td>From 9/7 kitchen scraps</td>
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<td>14</td>
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<td>9/16/2019</td>
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<td>Garden Loam</td>
<td>19.0</td>
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<td>Total</td>
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<td>60.0</td>
<td>61.5</td>
<td>29.5</td>
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<td>350.0</td>
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Program Reporting/Record Keeping

Tables from 2019 NW/PV Pilot Report:

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<th>Date Added</th>
<th>Type of Material</th>
<th>Number of Gallons</th>
<th>Additions after Primary Composting</th>
<th>Comments</th>
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<tr>
<td>6/29/2019</td>
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**Table Four: Reduction in Volume During Different Stages of Composting**

Use of NW/PV Report:
- Grant funding
- Outlined success of pilot and partnerships
- NEGEF awarded $750 for compost equipment and materials
Develop a Site plan

- Overview of the site & system
- Monitoring & record keeping
- Provisions for controlling odors
- Communication & training (internal & external)
  - Be a good neighbor!
- Animal control measures
- Safety & fire emergency plans
- Security & vandalism (if needed)
- Contingencies (including closure plans)
Health & Safety Recommendations

- Close or limit the number of people onsite at any one time
- There may be changes in volunteer/staff availability - make a plan!
- Consider changes to your collection/drop off procedures
  - Staggering drop-off times
  - Have people put their scraps directly in the system (training!)
  - Use certified compostable bags
  - Always have plenty of high C materials
- Practice social distancing (6+ feet away from others)
  - Mark 6-foot distances around drop-off or other compost system areas
  - No handshaking or hugging for greetings
Health & Safety Recommendations

• Choose the right tasks for everyone, particularly those with asthma, allergy or other health issues (or at higher risk)
• Wear disposable or washable gloves (consider face masks or shields)
• Wash your hands for 20-30 seconds (Happy Birthday x 2-3)
• Know if your temperatures are hitting 120° F
Health & Safety Recommendations

• Review proper tool use (in general)

• Tools/equipment for feedstock material should not be used for finished compost
  • If necessary, sanitize tools with household cleaners, bleach solutions (1/3 cup per 1 gallon water) or alcohol solutions of at least 70% alcohol
  • Tools should be set in the sun to dry as this helps to sanitize as well

• Regularly wipe down all parts of compost bins, storage bins, tools, and other surfaces which come in contact with food scraps and other feedstocks
Resources

- Northeast Recycling Council (nerc.org/nerc-resources/search-for-resources/)
- Composting Association of Vermont (CompostingVermont.org/community-food-scrap-composting-resources)
  - COMING SOON: Community Composting blog
- US Composting Council (compostingcouncil.org - Research/Educate)
- Institute for Local Self-Reliance (ilsr.org/composting/rg/composting)
Special Thanks To:

❖ Project partners
❖ USDA Rural Utilities Program

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* Composting Association of Vermont & Lakes Region Planning Commission are equal opportunity providers and employers.