



BEYOND THE BASICS

FOOD SCRAP & ORGANICS COMPOSTING

Athena Lee Bradley
Northeast Recycling Council
www.NERC.org

Food Recovery Hierarchy

Most Preferred

Source Reduction

Reduce the volume of surplus food generated

Feed Hungry People

Donate extra food to food banks, soup kitchens and shelters

Feed Animals

Divert food scraps to animal feed

Industrial Uses

Provide waste oils for rendering and fuel conversion and food scraps for digestion to recover energy

Composting

Create a nutrient-rich soil amendment

Landfill/ Incineration

Last resort to disposal

Least Preferred



or•gan•ics

1. Of, relating to, or derived from living organisms: organic matter
2. Yard & landscape trimmings—leaves, grass, tree & brush
3. Agricultural & land-clearing/forestry debris
4. Manures & biosolids
5. Food scraps & food processing residues
6. Non-recyclable/soiled paper—napkins, paper towels, pizza boxes & other paper products
7. Items manufactured from organics—“certified compostable” bags, plates, cups, bowls, other serveware



Percentage of Organics in MSW

- Largest component of MSW
 - ✓ 56%
 - ✓ Yard trimmings are recycled at 57%
 - ✓ Less than 6% of food scraps are recovered
- 30-40% of food is wasted in the U.S.
 - ✓ 62.5 Million Tons annually



Benefits of the Hierarchy

- Reduced disposal needs & costs
- Reduced greenhouse gas emissions
- Food recovery helps those in need
- Composting stimulates the local economy
 - ✓ Creates local jobs & business development
- Composting provides valuable soil amendment
- Anaerobic digestion generates energy
 - ✓ Utilizing locally generated resources



Food Scrap Collection



Step 1: Arrange for Processing

- Off-site composting or AD
 - ✓ Commercial compost operation
 - ✓ Farm operation
 - ✓ Community composting
- Onsite composting
- How to finance?



Step 2: Arrange for Hauling

- Processor may provide hauling
- Ask current hauler(s)
- Other trash/recycling haulers
- Dedicated food scrap hauler
 - ✓ Agri-Cycle
- Municipal hauling



Step 3: Collection System

- Staffed site is best
 - ✓ Monitor materials, helps reduce contamination
 - ✓ Controlled access
 - ✓ Answer resident questions about acceptable materials

Collection System, cont.

- Placement of collection containers
 - ✓ Transfer station
 - ✓ Public works yard
 - ✓ Landfill or recycling center
 - ✓ Other location(s) in a community (e.g., retail center)



Collection System, cont.

Private contractors

- Typically provide rental containers
- Transportation to a processing site

Municipal/Public

- Existing containers; used containers
- Existing municipal vehicles & equipment



Containers

- Food scraps only
 - ✓ 32-65 gallon carts on wheels
 - ✓ Dumpsters – 2- yard
 - Aeration system?
- Mixed yard waste/food scraps
 - ✓ 30-40 cubic yard roll-off dumpsters
- Storage of sawdust



Regulations

- Can collect meat & dairy
 - ✓ IF collection ONLY
- If TS has standard permit
 - ✓ Check with DES to see if a modification is needed
- Permit By Notice
 - ✓ Notify DES
 - ✓ Update Operating Plan



Regulations, cont.

- Actively managed
 - ✓ BMPs for facility
- No less than once per week pickup
 - ✓ Recommended
- Cover daily with sawdust
- Fully enclosed containers

Quality begins with the Generator





Promotion

- Simple, concisely worded fliers
 - ✓ Distribute at start of the collection program; periodically
- Signage at the point of collection
 - ✓ Hauler usually labels carts
 - ✓ Banner
- Website & social media

Collection Containers



Certified Compostable Liners



Kitchen Collection Buckets





Issues to Address

- Keeping bears & other critters out
- Odor control
 - ✓ Completely cover scraps with a thin layer of sawdust
 - ✓ Lock & secure bins at night
 - ✓ Empty at least weekly

Transfer Station Collection



Bear-resistant Containers



COMPOSTING

Science of
Composting





Composting

- Controlled, aerobic biological process
- Results in the decomposition of organic materials
- Macroorganisms & Microorganisms
 - ✓ Digest organic residues for food and energy
 - ✓ Speeds up the decomposition process
- Primary end-products—carbon dioxide, water, & compost



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



Benefits of Compost on Soil

- **Improves Physical Properties:** Increases water retention; improves soil aeration and structural stability; resistance to water and wind erosion; root penetration; soil temperature stabilization.
- **Enhances Chemical Properties:** Increases macro- and micronutrient content; availability of beneficial minerals; pH stability; converts nutrients to a more stable form, reducing fertilizer requirements.
- **Improves Biological Properties:** Increases the activity of beneficial micro-organisms; promotes root development; can increase agricultural crop yields; suppresses certain plant diseases; acts as biofilter, bonding heavy metals.



Raw materials

Organic matter - including carbon, chemical energy, protein and nitrogen

Mineral nutrients - including nitrogen and other elements

Water

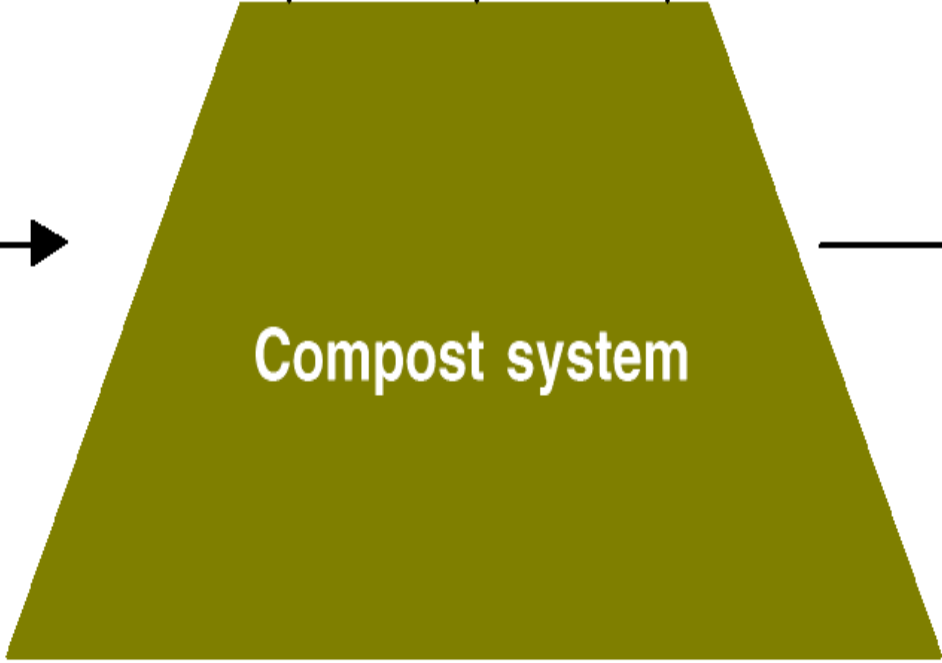
Microorganisms

Process

water

heat

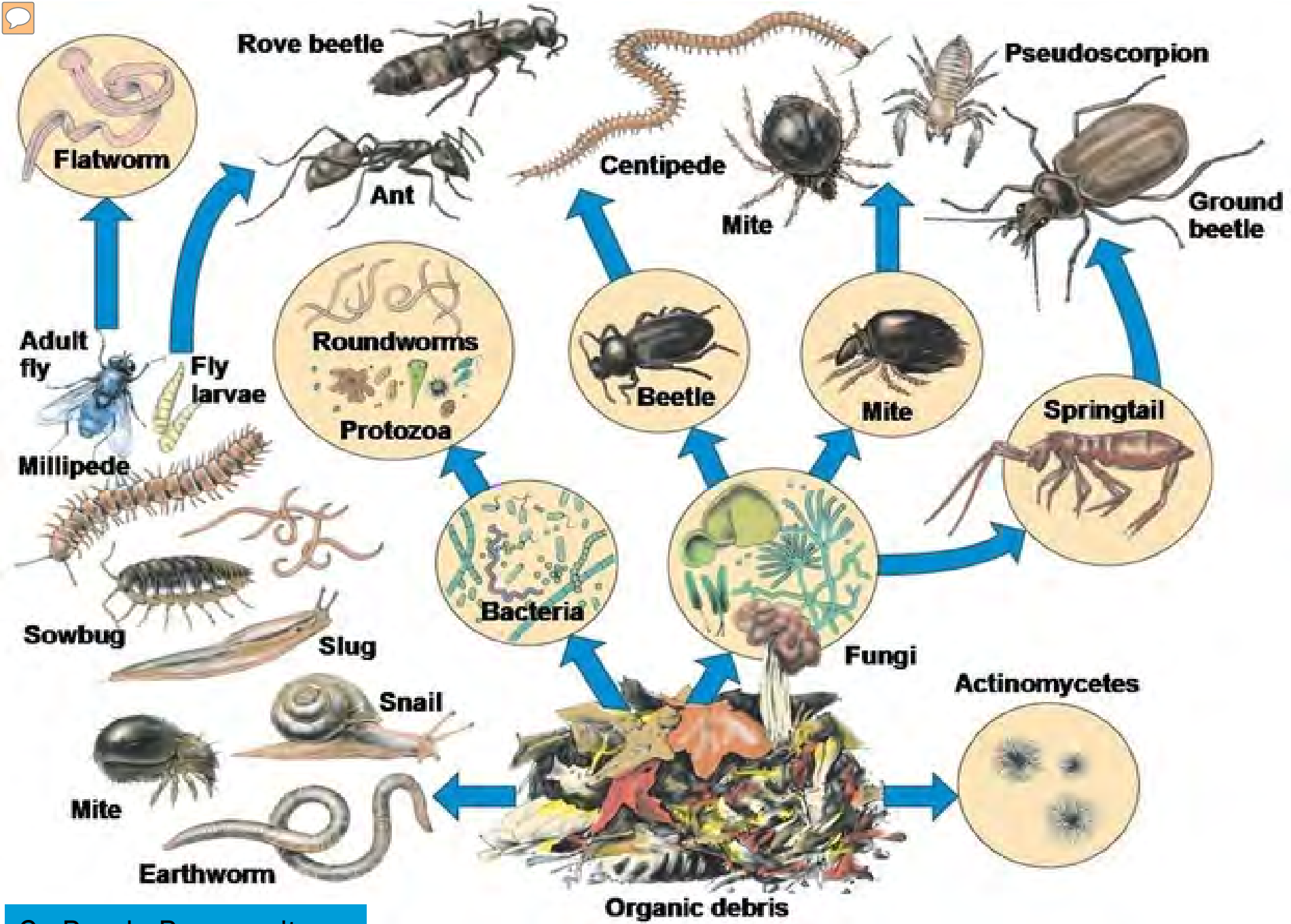
CO₂



Product

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

O₂





Elements of Composting

- 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
 - ✓ Preferred 50–60%
 - ✓ Like a damp sponge



Elements of Composting, cont.

- Optimum pH range - 5.5 to 8
 - ✓ Preferred 6.5 – 8.0
- Temperature – 120° - 160°F.
 - ✓ *Process to Further Reduce Pathogens*
 - ✓ 131°F for 3-15 days (*f* of system)



Elements of Composting, cont.

- Bulk density < 1000 lbs. per cubic yard
- Porosity, structure, texture - particle size, shape & consistency influence aeration
 - ✓ Adjust with bulking agents
 - ✓ Compost recipe
 - ✓ Grinding or mixing

Elements of Composting, cont.

- Particle size 3-13 mm
 - ✓ Smaller particles
 - ✓ More surface area upon which the microorganisms can feed
 - ✓ Helps to speed up the decomposition process
 - ✓ Improves porosity (air flow)
 - ✓ A more homogeneous compost mixture
 - ✓ Mowing, grinding, chipping, or shredding



Natural Air Circulation in a Compost Windrow

COMPOSTING

**Feedstocks &
Recipe
Development**





Feedstocks

- What feedstock(s) do you have available?
 - ✓ Particle size
 - ✓ Bulk density- how easy the material is to mix & handle
- Characteristics?
 - ✓ Nutrient content
 - ✓ C:N ratio
 - ✓ Moisture content
 - ✓ pH
 - ✓ Potential for odors – food scraps, grass clippings
 - ✓ Contamination

Recipe Basics

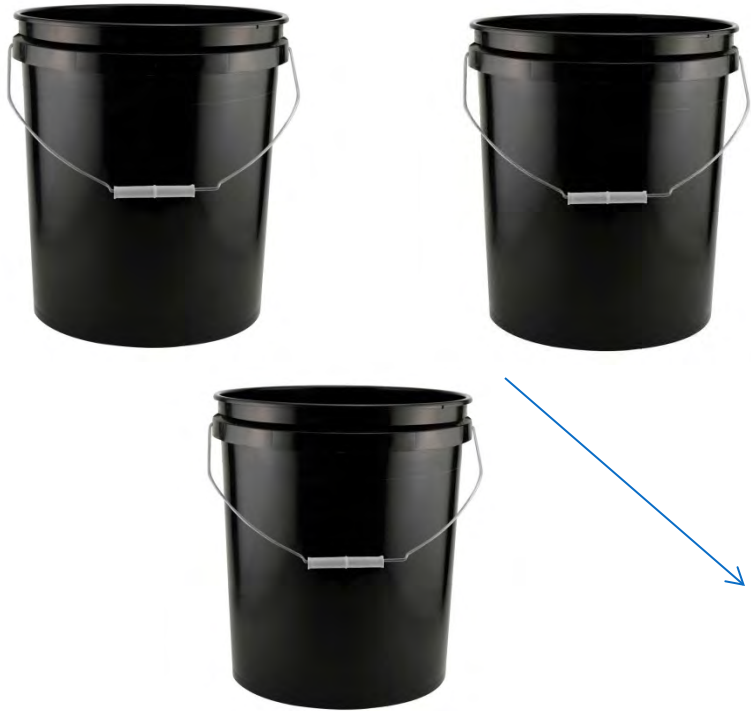
- “Green” materials (Nitrogen)
 - ✓ Food scraps, grass clippings, manure
- “Brown” materials (Carbon)—
 - ✓ Manure w/animal bedding, paper, dry leaves, wood shavings, brush
- Bulking agents – wood shavings, chips
 - ✓ Provide porosity
 - ✓ Pile stabilization
 - ✓ Aids air flow



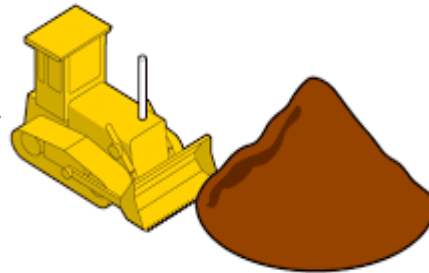
Recipe Basics, cont.

- Mix ingredients together to create a better balance— homogeneous mix
- Adding food scraps
 - ✓ No more than 20%
 - ✓ Balance C:N ratio, moisture, bulk density
- Observation, temperature, look & feel of compost, trial & error
- Calculations

High Carbon
3 volumes



High Nitrogen
1 volume



Sample Carbon and Nitrogen Ratios of Various Organics

| Carbon Sources | Carbon: Nitrogen Ratio |
|--------------------------|------------------------|
| Yard wastes | 50 - 90:1 |
| Straw/hay | 50 - 80:1 |
| Wood chips/sawdust | 250 - 500:1 |
| Nitrogen Sources | |
| Vegetable scraps | 10 - 30:1 |
| Fruit scraps | 10 - 30:1 |
| Grass & garden gleanings | 10 - 20:1 |
| Chicken manure | 10 - 25:1 |
| Cow manure | 20 - 30:1 |
| Horse manure | 25 - 30:1 |

Adapted from Robert Rynk, "On-Farm Composting Handbook," Natural Resource, Agriculture, and Engineering Service, 1992.



Getting the Right Mix

- Green Mountain Technologies
 - ✓ <http://compostingtechnology.com/resources/compost-calculator/>
- Compost Mix Calculator
 - ✓ <http://www.klickitatcounty.org/solidwaste/fileshtml/organics/compostCalcAbout.htm>
- Highfields Recipe & Pad Size Calculation Worksheets
 - ✓ www.highfieldscomposting.org

Healthy biological activity is essential to successful composting—setting up the right environment and conditions is fundamental to the process.

COMPOSTING

Compost
Methods &
Systems



Determine the Right System

- What's the feedstock
 - ✓ Availability & handling issues
 - ✓ Tip fees
- Annual processing needs & capacity
- Financial plan
 - ✓ Capital for equipment, labor, storage, feedstocks, marketing, etc.
- Determine the end-use for the finished product
- View as many real-life situations as you can

Windrow Composting

Low-to-Intermediate Technology, Costs, & Labor





Windrows





Windrows Basics

- Land for the operation
- Minimum staffing
- Front loader, backhoe, manure spreader, or windrow turner
 - ✓ Mix materials, form & turn windrows



Windrows Basics, cont.

- Access to water
- Monitor temperatures
 - ✓ PFRP - 131 °F for 15 days, turning 5 times
- Cover –Chips, tarp, GORE™



Windrows BMPs

- 10' – 16' wide by 3' – 8' high
- Keep windrow piles as straight & uniform as possible
- Blend materials without compacting them
- Check & adjust moisture level
 - ✓ Add water or dry bulking agent

Windrows BMPs, cont.

- Move materials from surface to center of windrow and vice versa
 - ✓ When turning with a frontend loader, lift material, let it cascade down to maximize aeration & porosity
 - ✓ Re-shape the windrow for consistent dimensions & smooth sides
- If building more than one windrow, leave sufficient space between them for drainage & to allow for turning
 - ✓ Track when windrows were formed



Windrows BMPs, cont.

- Monitor temperatures daily during the active compost phases & after turning
 - ✓ Take measurements at various depths & at least every 75 feet along the windrow
 - ✓ Always turn and aerate a pile or windrow if temperatures reach above 160° F

Windrows BMPs, cont.

- Moisture management is important
 - ✓ If is too dry, add water when turning & rebuilding the windrow
 - Start by watering the outside of the pile before mixing materials into the center
 - Shape the windrow to increase rain infiltration
 - ✓ If the windrow is too wet
 - Turn it to release excess water vapor or mix more dry carbon material into the pile



Windrows BMPs, cont.

- Once the active composting phase for PFRP is met, turn materials weekly or as needed until ready for curing
- Windrows typically reduce 60% in volume during active composting
 - ✓ Two windrows can then be combined into one to free up space
- Curing time can range from 30 to 60 days



Seacoast Farms





ALWAYS SOMETHING FARM





TAM Organics



Martin's Farm





Windham Solid Waste Management District





WSWMD - Specifics

- 20 member towns
- 497 tons SSO processed in 2016
- Screened to 3/8 inch
 - ✓ Compost product & compost/soil mix product
- Cash positive operation
 - ✓ Tipping fee \$65/ton
 - ✓ Compost sells \$20/cy



Town of Skowhegan



Screening Compost

 **Aerated Static
System
Moderate
Technology,
Costs & Labor**





Aerated Static Systems

- Forced air compost system
 - ✓ Compost pile is built on top
- Perforated pipe (10-inch diameter) is connected to a blower system
- Create homogeneous mixture prior to forming pile
- Cover with a layer of peat, wood chips, or finished compost
 - ✓ Insulation & odor control

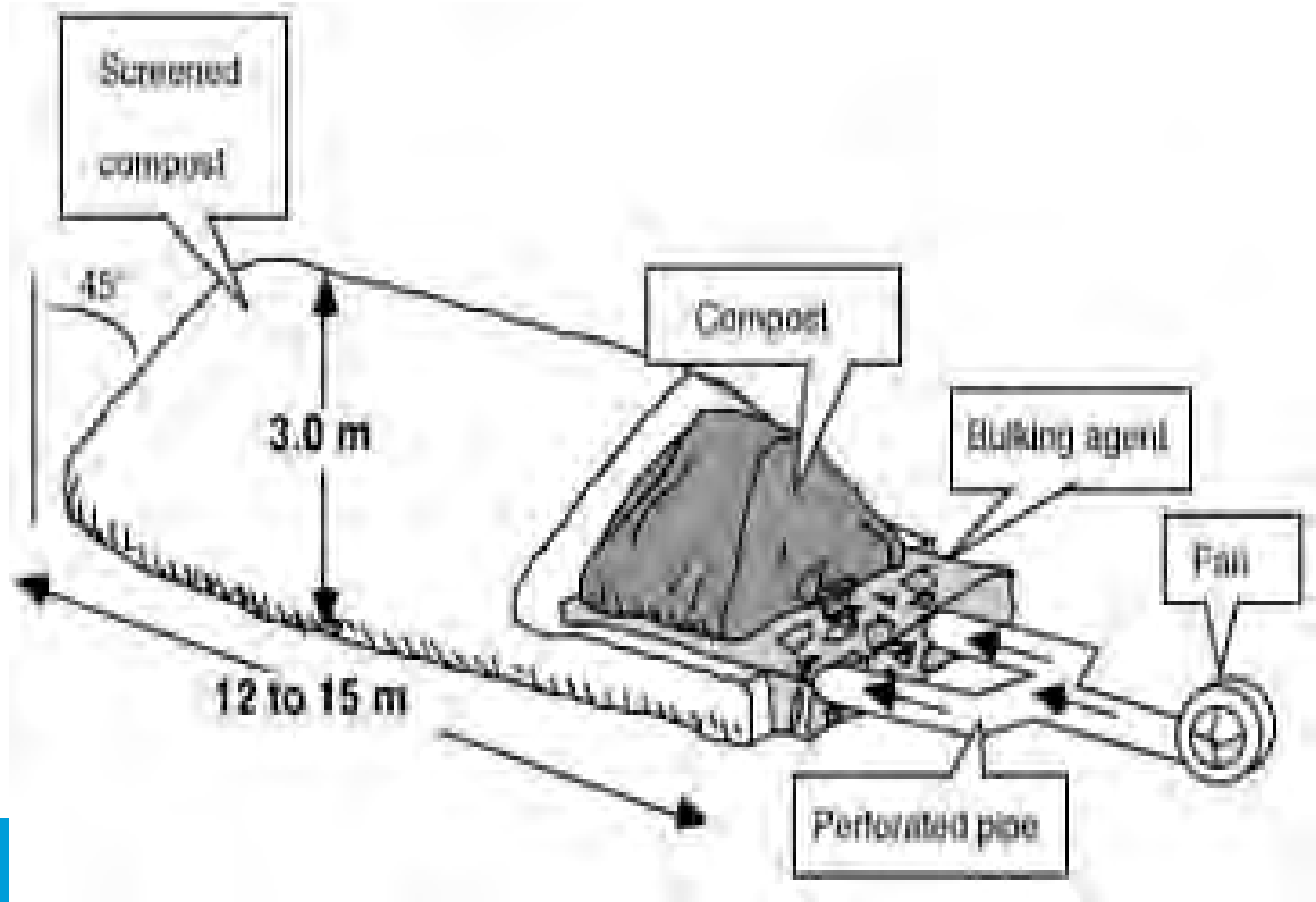


ASP, cont.

- Speeds up the composting process by ensuring proper air flow
- Initial moderate capital costs & operating costs
 - ✓ Purchase & installation of pipes and blowers
 - ✓ Utilities & ongoing maintenance
 - ✓ Less daily labor
 - ✓ Portable aeration equipment can be installed for \$15,000 or less
 - Suitable for a 10,000 TPY compost facility

ASP Best Management Practices

- Homogenous “haystack” type pile 4’ – 6’ high
 - ✓ No more than 6’ high and 12’ wide to ensure sufficient air movement
- Start with a higher initial moisture content
- Include a bulking agent or carbon source with higher percent of larger particles to promote greater aeration



ASP BMPs, cont.

- Use a porous, well-aged capping layer
 - ✓ Wood chips or finished compost
- Sufficient space should be available for additional piles
 - ✓ Depending on the volume of organics
- Place a layer of woodchips over aeration pipes to help protect the pipes & assist in air flow through the pile

ASP BMPs, cont.

- In 2-10 weeks of composting, material can be turned into another aerated system or windrowed to finish the compost process
 - ✓ Up to 6 months to produce compost ready for curing

Aerated Static Windrow



Protecting The Pipes



Photo Cr.: Green Mountain Technologies/Compost Design Services



**Cedar Grove Composting
Seattle, WA region
Gore Cover systems
Aerated static piles**

Photo Cr.: Bruce Fulford



Green Mountain Compost



Green Mountain Compost



GMC - Specifics

- Equipment: Front loader, vertical auger mixer, ASP system, star
- Food scraps processed: 4026 traditional food scraps (+ ~770 tons pre-consumer food residuals)
- Tipping fee: \$45/ton
- Sells: Compost for \$40.50; Blended average (\$59 retail)/cy

Onondaga County Resource Recovery Agency





Sheds





Bays



3-Bin System



Photo Cr.: George McDonald, Maine DEP

In-Vessel



Community Composting



CR: David Hurd,
GrowNYC



Equipment

- Pre-processing equipment:
 - ✓ Mixer, manure spreader, tub grinder, horizontal grinder
- A frontend loader
 - ✓ 500 – 5,000 cubic yards/year or less
- Windrow turner
- Post-processing equipment: trammel screen



Front-End Loader vs. Turner

- Front-end loader works well for small scale operations (<500-2,500 yd³/yr)
 - ✓ >2,500 yd³/yr, loader tends to be time intensive
- Turner physically agitates ingredients & can accomplish task in half the time
- Turner requires a tractor to run, therefore additional cost



OCCRA EQUIPMENT

- 2 front-end loaders
- 2 skid loaders
- 1 compact excavator
- 1 vertical mixer on truck chassis
- 1 slow speed shredder
- 1 high speed grinder
- 1 trommel screen (2 – drums, 1/2” and 1/4”)
- 1 portable compost bagger



Front Loader



Tractor with bucket



Windrow Turner





Mixer



Auger



Screening



BioCycle

Screenener



Photo Cr.: Mark King

Covers

- Types
 - ✓ Impermeable
 - ✓ Microporous Membrane
 - ✓ Spun or open weave fabrics
- Can help control moisture levels
- Reduces temperature variability
- Helps control odors

COMPOSTING

Facility
Development
&
Management



Successful Composting Requires

- A solid plan of action
- Available land
- Appropriate equipment
- Proper training and management
- Community support



Planning a Compost Operation

- Estimate the volume expected
- Needs assessment: determine available space, staffing, & equipment
 - ✓ And, additional land/operating space, staffing, & equipment required
- Capital & operating requirements necessary for start-up, as well as ongoing expenses



Planning, cont.

- Know your regulations/permit requirements
 - ✓ Consult state agencies
- Feasibility of the operation
- Public involvement

Funding Options

▪ Tip Fees

- ✓ Residents
- ✓ Landscapers & other small commercial generators
- ✓ Keep fees lower than solid waste tip fees

▪ Sales of compost product

- ✓ Mulch – grind brush, wood, pallets
- ✓ Compost – quality product can be sold to offset costs

Cost Control

- Sharing equipment & labor
- Using available public land
- Used equipment
- Calculating avoided disposal costs
- Reduced soil & fertilizer purchase costs through use of compost



Financing

- Capital & operating requirements will vary
 - ✓ Needs for smaller scale operations will be minimal, if existing land & equipment are available for use
- Site preparation & drainage requirements can potentially be conducted in house, depending on the requirements
 - ✓ If equipment is needed & more extensive site preparation required, financing professionals should be consulted



Siting Parameters

- Check with state & local regulatory agencies prior to siting
- “Set-backs” or distances from waterways & structures may vary depending on the materials & volume to be composted

General Guidance

- From 100' – 500' from wells and potable water sources
- Adequate distance from wetlands, surface water bodies (streams, ponds), and flood plains
 - ✓ Recommended at 200'
- Minimally 200' away from residences & 50' from property lines



General Guidance

- A low water table to reduce flooding risk on the site
- A high soil percolation rate, but not excessively permeable soils in order to avoid standing water.
- Gently sloped surface (1-3% grade)

Land Requirement

The amount of land required for the composting site depends on the volume and type of material accepted, the composting system, and the amount of time required for the process to complete.

- Typically 2 - 20 acres is adequate for most small operations



Site Plan

- Material receiving area
- Mixing area
- Active composting area
- Curing area



Mixing Area

- Storage of carbon & bulking materials should be near mixing area
- Mixing & chipping/shredding can be done in or near the material receiving area
- Dump food scraps onto a bed of bulking materials to absorb liquid
- Cover & mix food scraps immediately upon dumping

Mixing Area



Photo Cr.: BioCycle

Mixing Area



Photo Cr.: Bob Spenser, WCSWMD



Mixing Area





Grow Compost





Mixing Area Under Cover

Mixer



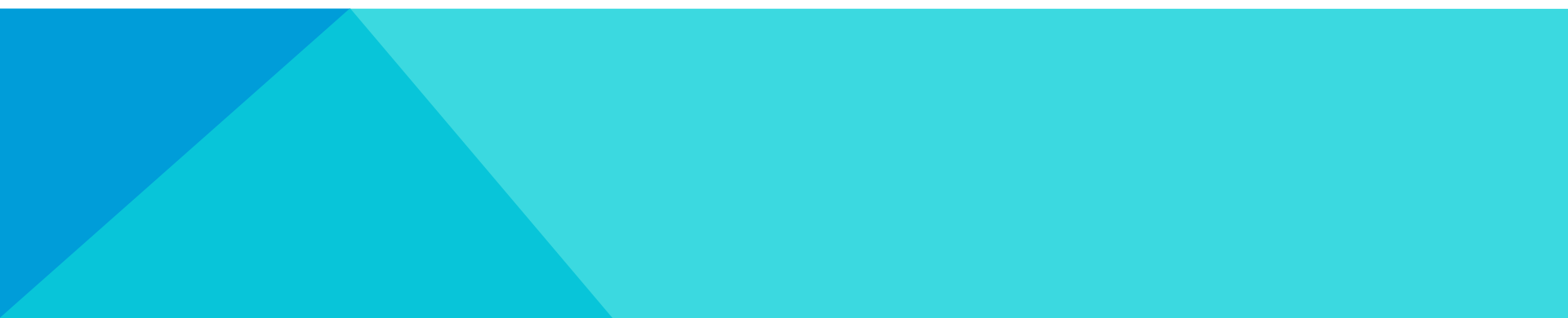


Siting Specifics

- Site
- Materials flow
- Leachate & storm water management
- Equipment & personnel list
 - ✓ Qualifications and/or training



Siting Specifics, cont.

- Composting method
 - Safety & fire emergency plan
 - Monitoring techniques & record keeping
 - Provisions for controlling odors
 - Contingency plan
- 



Site

- Year-round accessibility
 - ✓ Prepare for vehicle access
 - ✓ Space for future expansion
- Access to a water source is necessary
- Gate & a perimeter fence
- Control access to site
 - ✓ Prevent illegal dumping



Site, cont.

- Signage
 - ✓ Control incoming traffic
 - ✓ Restrict public access to areas where equipment will be operating
- Area to store finished compost
 - ✓ Accessible to the public



Site, cont.

- Plan site so that customers see the end product...not the receiving & mixing area
- Set up the site so that the oldest finished product can be moved first
- Material movement is in as linear a fashion as site constraints allow
 - ✓ Nothing should move more than twice in its same physical condition

Site, cont.

- A neat site appearance is important
 - ✓ Don't let weeds grow on finished product
 - ✓ Deal effectively with leachate or ponding
 - ✓ Consider the view from the road

Site, cont.

- A “buffer zone” will alleviate nuisance issues
 - ✓ Noise, blowing material, dust, potential traffic concerns, & odor
 - ✓ Use shrubbery or fencing to block view



Compost Pad

- Firm & stable surface to support heavy equipment under varying weather conditions
 - ✓ Compacted soil is adequate
 - ✓ Native soil with moderate permeability is best

Compost Pad, cont.

- Hard packed or cement mixing area
 - ✓ Recommended if affordable
 - ✓ Limit mud problems
 - ✓ Good foundation for equipment



Compost Pad, cont.

- 6 inches of compacted, graded sand or gravel should be installed if soil conditions are not sufficient for drainage
 - ✓ Small diameter dark gravel is recommended
 - ✓ Gravel can become mixed in with the composting materials



Drainage/Buffer

- A grassy or vegetated filter/buffer
 - ✓ Relatively low cost drainage field
- Rain gardens & marsh areas
 - ✓ Work for smaller sites
- Check with state/local agencies to determine if drainage system is adequate



Drainage/Buffer, cont.

- Site grading to divert surface runoff from the up-slope side of piles
- Trenching to capture or divert leachate
- Install piping around larger piles or windrows or where seepage is an issue
- Capture wastewater and divert it to the filter area, drainage pond, or holding tank
 - ✓ Reuse water

Grow Compost – Grassy Buffer



Grow Compost – Grassy Buffer



Crushed Glass Drainage Filter



Image Cr. Mark King



Drainage Pond



Great...



Okay



Not good...



Controlling Odors



Photo Cr.: BioCycle

Biofiltration



Photo Cr.: Bruce Fulford



Good Neighbor Strategy

- ✓ Know your neighbors & keep them happy
- ✓ Give them compost!
- ✓ Respond appropriately & quickly to complaints

COMPOSTING

Regulations



COMPOSTING

Process
Management
& Quality
Control



Key Tips for Success

- Location
- Precondition materials
- Bulking agents
- Mix ratios
- Monitor loads
- Drop & cover
- PFRP



Process Management

- Know the compost process
- Essential equipment: loader, screen, thermometer
- Cover
- Keep records



Best Management Practices (BMPs)

- Produce compost in shortest time possible with:
 - ✓ Minimum odors
 - ✓ Minimum environmental impacts
 - ✓ Minimum process-related problems

BMPs

- Efficient Materials Movement
 - ✓ Nothing should move more than twice in its same physical condition
 - ✓ Move in as linear a fashion as site constraints allow
 - ✓ Timing production

Process to Further Pathogen Reduction

- **Turned Windrow:** 15 consecutive days with temperatures $\geq 131^{\circ}\text{F}$ (55°C) with 5 turnings
- **Aerated Static Pile:** 3 days with temperatures $\geq 131^{\circ}\text{F}$ (insulated pile)
- **In-vessel:** 3 days with temperatures $\geq 131^{\circ}\text{F}$

Staffing

- For most small community operations one or two employees will be sufficient
 - ✓ Staff may be shared
 - If operation is co-located with a transfer station or other facility
 - ✓ One person should have the role of compost operator or manager
 - ✓ All employees should understand & know all aspects of the operation
 - How to deal effectively with issues that arise

Duties

- Monitoring materials as they come into the operation
- Ensuring BMPs
- Monitoring & maintaining records



Employee Training

- Basic understanding of the compost process
- Know how to monitor & record temperatures & assess moisture levels
- Be familiar with general troubleshooting guidelines to manage issues as they arise
- Equipment operators must be trained & properly certified



Monitoring Equipment

- Long-stem, non-mercury compost thermometer at least 2' -3' long
- Moisture meters & oxygen probes
- Windsock
 - ✓ Monitor wind direction
- Safety equipment: hard hats; steel-toe boots; safety vests; dust masks; eye/hearing protection



Thermometer



Observing, monitoring, and record keeping should be the foundation for decisions and activities at the compost operation, whether it's turning the materials and adding water because temperatures are below 120°F and moisture content is low or adding carbon or bulking agents because the materials are too wet.

BE ONE WITH
THE PILE



Monitoring the Process

- *Daily Observation*
 - ✓ Are the windrows or piles steaming?
 - ✓ Are materials looking different
 - Is decomposition occurring
 - Materials starting to slowing look like soil?
 - Is the pile uniformly composting?
 - ✓ Are strong odors present?



Monitoring the Process

- Are there persistent puddles of leachate or water?
- *Compost feel*
 - ✓ Does the squeeze test indicate that there is moisture in the material
 - ✓ Does it feel like a damp sponge so that when a handful is squeezed, it sticks together & hand is moist



Monitoring the Process

- *Oxygen*—Smell is the best measure of properly aerated composting
- Unpleasant odor – indicative of anaerobic conditions
 - ✓ Pile needs to be turned



Monitoring the Process

- *Daily temperature monitoring*
 - ✓ Is the temperature rising appropriately for rapid compost?
 - ✓ Does the temperature rise to at least 131°F in windrows
 - ✓ Maintain for PFRP

Monitoring the Process

- Once the temperature goes below 120°F materials should be turned until temperatures no longer rise
- Materials should also be turned if temperatures rise above 140°F
- Depending on the materials, system, & compost management, the active composting phase will last 6 – 10 weeks

Ready for Curing

- Ingredients are digested & bacterial activity declines
- Compost pile heats up very little
 - ✓ Even after turning or aerating the pile
- Finished compost will have a uniform, crumbly appearance, earthy smell

Curing

- Necessary part of the compost process
 - ✓ Should be cured for a minimum of 45 days
 - ✓ Ensures compost is completely done & ready for use
- Cured compost is stable
 - ✓ Ammonia nitrogen converts to nitrate nitrogen
 - ✓ Large woody particles continue to break down
- Compost ingredients not recognizable
 - ✓ Wood chips may not entirely decompose & will require screening

Curing Piles



Curing Piles





Quality Assurance

- Observe, monitor, sample, analyze, test
- *Keep accurate compost records*
 - ✓ Track feedstock sources, materials, problems
 - ✓ Track lot numbers, problems
 - ✓ Track turning frequency, temperature
 - ✓ Odor issues
- Train your staff

Product Quality Certification

- Seal of Testing Assurance (“STA”/USCC)
- Woods End
- Rodale Quality Seal
- Soil Foodweb
- Organics/“Approved” for use



US Composting
Council

*Seal of Testing
Assurance*

- University Testing
- Other



Why Test? Why Certification?

- Standardization of products, practices, & applications
- Helps to improve customer confidence in the compost product and its utilization



Compost Test

- At a minimum—analyze the basic nutrient content—nitrogen, phosphorous, & potassium (N:P:K:)
- Bioassay testing

Bioassay Testing



COMPOSTING

Finished
Product End
Use





Screener





Brattle grow Compost

Windham Solid Waste Management District's
All Purpose Compost

Call to order 802-257-0272

ORGANIC COMPOST



SOIL CONDITIONER



SOIL CONDITIONER



ORGANIC COMPOST

SOIL CONDITIONER

HIGH HUMUS CONTENT



1.5
CUBIC FEET



OCCRA



Bagger





COMPOST MARKETS

- Erosion Control/Reclamation
- Agricultural applications
- Topsoil
- Nurseries/Silviculture
- Sod production
- Turf grass
- Public Works
- Construction sites
- Landfill cover
- Marginal soils

- Direct marketing
- Retail sales
- Landscapers and Lawn Care Companies
- Golf Courses
- Greenhouses
- Rainwater filters
- Roof top gardens
- Compost socks
- Biofiltering

Major Factors Affecting Compost Demand and Sales

- Compost quality
- Product consistency
- Product availability (meeting demand)
- Economics of transportation
- Economics & challenges associated with compost application
- Industry standards & specifications



Grow Ulster Green Compost

- \$30 Per Ton
 - ✓ Sold In BULK Only
- Screened To 3/8 Inch Minus
- Certified By USCC

COMPOSTING

Other Food
Scrap
Diversion
Options



On-Farm Composting

- Provides opportunity to divert organics
 - ✓ Without public investment in space, equipment, & staffing
 - ✓ Farm operations may have more flexibility in permitting requirements
- Helps farms diversify their operation
 - ✓ Manufacturing a valued added product
 - ✓ Soil amendment for farm fields
 - ✓ Sold to bring in additional revenues



Private Sector Composting

- Partnerships to promote resident & commercial customers
 - ✓ Reduced tipping fees
 - ✓ Flexibility in accepting loads (resident drop-off)
- Economies of scale—multiple community, county or solid waste district jurisdictions—more economically appealing for larger scale private composting operations
- May profit from locating in rural, agricultural areas & servicing more populated area



Private Sector Cont.

- Publicly owned & Privately operated
 - ✓ Typically land would be public
 - ✓ Equipment & staffing private
 - Landfill, MRF
 - ✓ Private haulers to provide collection services

Opportunities and Action

- Explore potential with private-sector businesses or farms
- Promote to & train residents
- Find haulers
- Promote compost product sales

Quasar Food Scrap AD Facility Collinwood, Ohio



Photo Cr.: Bob Spenser, WSWMD

Harvest Power



Photo Cr.: Wayne Davis, Harvest Power

Vanguard Renewables Anaerobic Digester



Power Generation



COMPOSTING WORKSHOP: SUCCESSFUL MUNICIPAL AND INSTITUTIONAL DESIGN

AUGUST 9 -10, 2017 (WED-THURS)

**DAY 1: BASICS OF COMPOSTING WITH HANDS-ON
EXERCISES**

**DAY 2: MORE HANDS-ON AND SITE VISIT TO FARM
COMPOST**

ALWAYS SOMETHING FARM, 407 ROUTE 10, CROYDON

Presenters:

**Mark Hutchinson, Extension Professor, Instructor at the Maine
Composting School**

Athena Bradley, Northeast Recycling Council

Tara Albert, NH Department of Environmental Services

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We're experts in

- Waste reduction & recycling
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- Organics management
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- Electronics recycling
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- Textile recycling programs
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