

Introduction to Food Waste Recycling in Puerto Rico

Reed P. Hepperly

Hepperly Enterprises

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- Who we are
- Our goal
- The problem of food waste
- In-house vs Pick-up
- Technologies
- Factor to consider in selecting technologies
- The current status of food waste in Puerto Rico
- What has been done? What can we do?
- Q & A's

Who we are

- Hepperly Enterprises is one of the leading compost companies in the west coast of the Island. We receive yard and organic waste from municipalities, contractors, landscapers and industry in general in order to convert the “green waste” into a valuable product. Hepperly Enterprises also advises both private and government parties. We advise in how to implement effective in-house diversion of organic waste streams and develop finished products of wastes that have been traditionally deposited in the landfills.

Our goal



From waste...

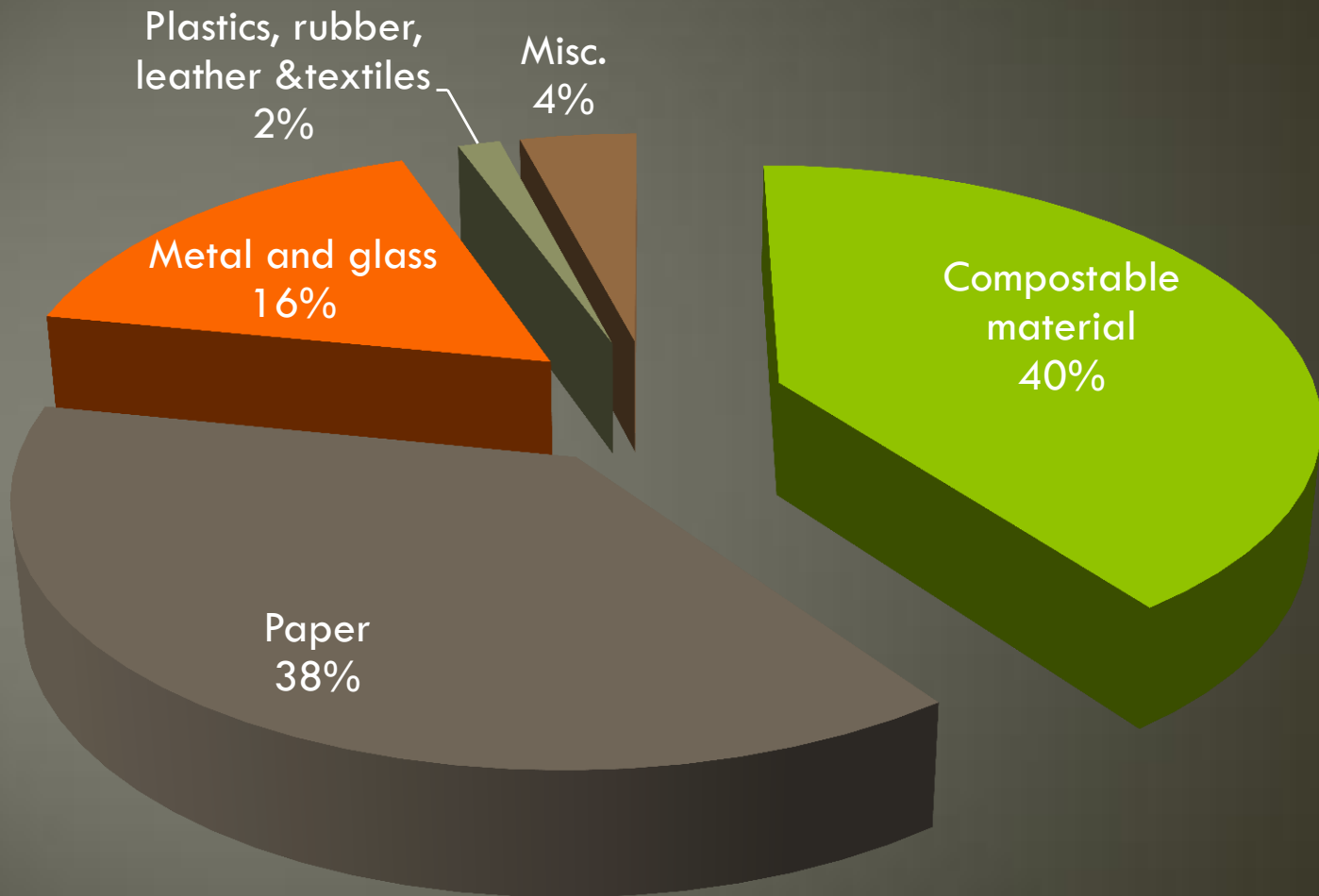
...to a valuable commodity



The problem of food residues

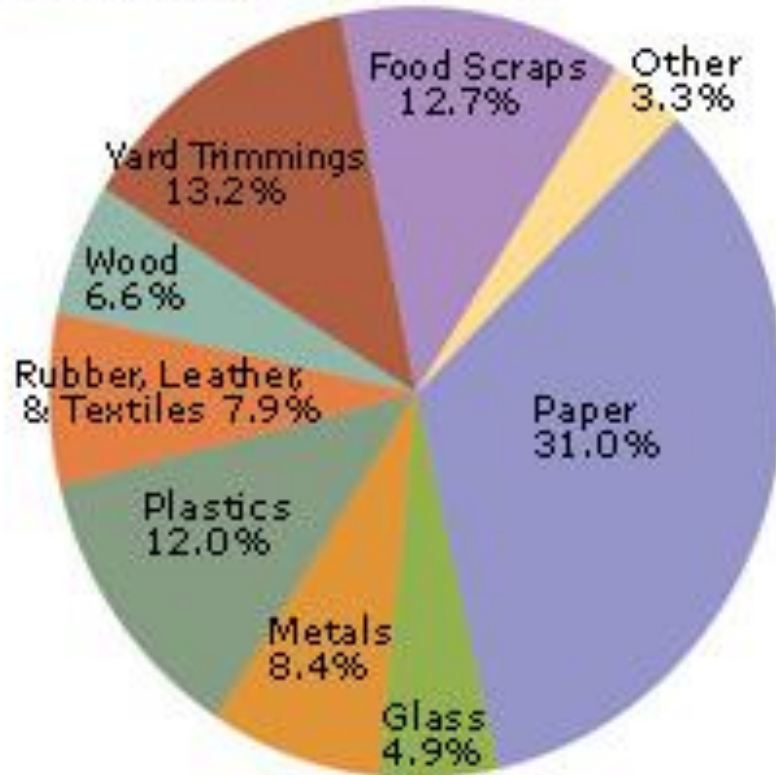


US averaged residue composition



Total MSW Generation (by Material), 2008 250 Million Tons (Before Recycling)

- Paper 31.0%
- Yard Trimmings 13.2%
- Food Scraps 12.7%
- Plastics 12.0%
- Metals 8.4%
- Rubber, Leather, & Textiles 7.9%
- Wood 6.6%
- Glass 4.9%
- Other 3.3%



USA residue composition

<http://www.epa.gov/epawaste/consERVE/materials/organics/food/index.htm>

In-house vs. Pick-up

In- House

- **Advantages**

- ✓ Reduces or eliminates transportation costs
- ✓ The finished product can be used within the facilities to substitute fertilizers and other inputs
- ✓ Long term savings

- **Disadvantages**

- ✓ The need of space for processing and storage
- ✓ Specialized training for personnel
- ✓ Permits
- ✓ Investment and cost

In-house vs. Pick-up

Pick-up

- **Advantages**
 - ✓ Very little initial setup
 - ✓ Pay as you go
 - ✓ No need for permits
 - ✓ No need for space or specialized equipment
- **Disadvantages**
 - ✓ Dependency on an established center
 - ✓ Higher long-term costs due to handling and transportation

Technology Overview

Some technologies that can be implemented in Puerto Rico include:

- Windrow
- Aerated Compost Bins
- Rotary Drum Composters
- Industrial Composting Systems
- Small Scale Compost Bins

Windrow Composting

- Long, narrow piles agitated or turned regularly
- Natural/passive aeration
- Better suited to larger volumes
- Composting Time: 3 - 6 Months



Windrow turner



Windrow system
at Rodale Institute,
Pennsylvania



Windrow Composting

- Equipment Needed
 - Grinder/Shredder
 - Tractor
 - Windrow Turner
 - tractor-pulled
 - self-propelled
 - Screener



Aerated Compost Bins

- Aeration through porous floor plates
- Composting Time: 2 - 3 Weeks
- Curing Time: 2 Months
- Equipment needed: front end loader
- Vector/vermin control



In-vessel composting Rotating Drum



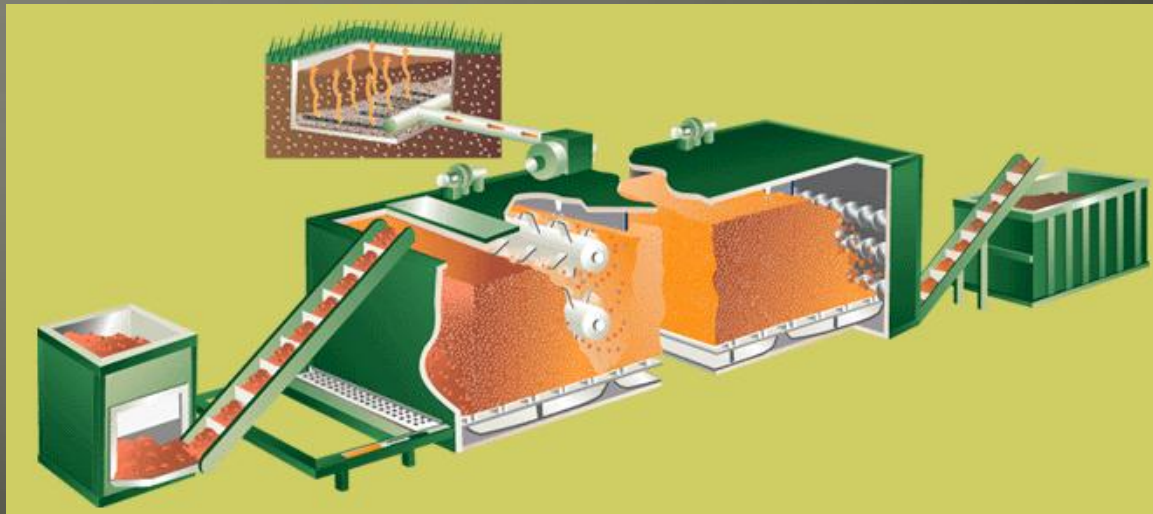
Rotary Drum Composters

- Prior to feeding drum with food waste, it must be ground and mixed with bulking agents.
- Rotation mixes and aerates compost mix
- Composting: 2 weeks
- Curing: 1 month
- Good vermin and odor control



Industrial Composting Systems

- Big capital investment
- Dependent on large volumes
- High energy consumption
- Quick turn around of material
- Good odor and environmental controls



Small scale composting

- Relatively small investment
- Modular design, batch operation
- Small capacity (average 1 restaurant)
- 2 months cycle
- Small footprint
- Easy operation



- Factors To Consider In Selecting Technology

- Available capital
- Available space
- Available labor
- Available support: local consultants and experts
- Control of odors, vermin, and vectors
- Life-cycle costs of equipment



The current status of food waste recycling in Puerto Rico

What has been done?

- Not much...
... although individual efforts have been consistently made. Perhaps the most commonly known is the diversion of food waste for pig farms.

Why?

- There is not a clear government policy about food and organic waste recycling. The laws that exist are not being emphatically enforced.
- There are no incentives nor penalties for food waste diversion from landfills, even though it is a large percentage of our solid waste.
- Waste management companies do not offer separate pick-up for food/organic waste.

What need to be done?

- The waste problem in Puerto Rico is alarming due to the limited landfill space. The private sector should not wait until the problem is critical and until the government establishes a coherent recycling policy.
- Private sector with high volumes of food/organic waste can pool their resources to fund their own recycling centers/programs. This sector include – yet is not limited to – hotels, restaurants, supermarkets, fresh vegetable markets (Plazas del Mercado).

What else can we do?

- Urge the government to take action by:
 - ✓ Promoting the use of empty industrial areas for food and organic waste recycling, especially in urban and metropolitan areas with high waste volume
 - ✓ Establishing incentives and penalties that stimulate food and organic waste recycling
 - ✓ Facilitate and/or cover permit costs for newly established recycling centers



Questions?

Thank you for your attention

REFERENCES

- Environmental Protection Agency:
 - “Food waste”:
<http://www.epa.gov/epawaste/conserva/materials/organics/food/index.htm>
 - “Composting”:
<http://www.epa.gov/osw/conserva/rrr/composting/index.htm>
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- Craig Coker, “Food Waste Diversion at Correctional Facilities: Composting Technologies and Costs”.
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