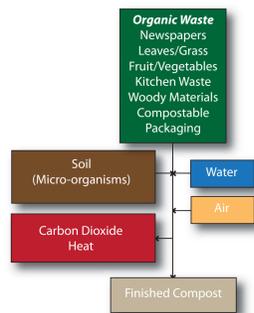


I PRO 312: The Rotten I PRO

What is Composting?

Composting is a form of biological decomposition, which occurs naturally when plants fall to the ground, slowly decay, and return nutrients to the soil. Decomposition is performed mostly by bacteria, yeasts and fungi. Composting involves accelerating the breakdown of materials by adding bulking agents (such as wood chips), oxygen, and water.



What are the Benefits of Composting?

Environmental

- Prevents emission of greenhouse gases
- Reduces pollutants
- Saves energy
- Source reduction
- Increased landfill life
- Prevent soil erosion
- Increase soil's performance
- Enhance plants' resistance to diseases
- Remediate soils contaminated by hazardous waste
- Eliminate the use of chemical fertilizers

Economical

- Decreased disposal costs
- Potential revenue from compost sales
- Marketable commodity as soil amendments
- Contribute to higher yields of agricultural crops

Social

- Reduces carbon footprint
- Reinforces a 'cradle to cradle' approach- waste as providing nourishment for something new
- Promotes sustainable living

Issues

According to the U.S. Environmental Protection Agency, in 2007, the U.S. generated more waste than any other nation in the world- more than 254 million tons or approximately 4.6 pounds of waste per person per day.

It is estimated of the 254 million tons of waste, 33.4% is recovered and recycled or composted, 12.6% is burned at combustion facilities, and the remaining 54% is disposed of in landfills.

Organic materials, comprised of yard trimmings, food scraps, wood, and paper products, make up the largest component, more than two-thirds, of the nation's waste stream.

Objectives

1. Investigate the amount of organic waste that IIT produces on a weekly, monthly, or annual basis
2. Work with personnel within IIT and seek the guidance of outside sources affiliated with sustainability
3. Research the mechanics, regulations, and case studies of composting facilities
4. Present the team's proposal and results to IIT administrators
5. Raise awareness among IIT's student body of importance of organic waste recycling



In-Vessel Composting Model A900 Rocket Composter

Features

- Identified as the best solution based on municipal regulations and the university's needs
- Systems monitor temperature, oxygen, and moisture
- Capacity: 4.5 cubic yards per week

Projected Cost Analysis

Initial Purchase: \$52,500
-includes delivery, installation, & 1 year warranty

Maintenance and Labor: \$2,000/year

Expected Life: 20 years

Payback: within 5 years

Savings: \$10,000/year

- avoids disposal costs
- compost is generated on-site that IIT would purchase otherwise

Illinois Institute of Technology

-Commitment: 'IIT to become the most sustainable, urban university campus in the United States.'

-Food Waste: 1,360 cubic yards/year

-Landscape Waste: 250 cubic yards/year



The Rocket
Accelerated Composter



Challenges

1. **Waste Audit:** An official audit will confirm the accuracy of organic and landscape waste estimates that were obtained through investigation on campus.
2. **Regulations:** City ordinances restrict the method of composting, volume of organic waste, and content of material.
3. **Cost:** Upon conducting a data analysis, the initial purchase of equipment can be funded by state grants and sponsorship.
4. **Lifestyle:** In cooperation with IIT's Office of Campus Energy and Sustainability, we seek to educate, provide the tools, and promote a sustainable lifestyle within the IIT community and beyond.

Alternative Methods of Composting

Due to composting regulations in the Chicago land area we were limited to an in-vessel unit mainly because of its protection against vectors and its ability to prevent and contain odor.

Compost Pile

- Combining ratios of organic material into a pile
- Can vary in scale from backyard to commercial piles
- Labor intensive- need to aerate and keep moist
- Potential for odor and infestation by vectors
- Compact in size
- Shorter time span to compost (2/3 less than pile)



Vermicomposting

- Adding earthworms (often Red Wigglers) into a bin with organic material
- Can vary in scale from home to commercial systems
- Best for locations with harsh winters (kept indoors)



<http://www.highcountryconservation.org/composting.htm>

Thank You...

Kevin Pierce, Joe Clair, Wendy Surak, Tom Jacobias, Jennifer Keplinger, Kimberly Goodell, Joelle Mogerman, John Anderson, Alan Cramb, David Baker



St. Olaf College
Allegheny College
Dickinson University



Team Members

Blake Davis - Faculty Advisor

Matt Cargill, Matt Coad, John Dominski, Richard Gulling, Isida Karpuzi, Stacy Morton, Lisa Nielsen, Cindy Oblenida, David Olichwier, James Rossi, Emily Ryan, Paulina Szpiech

I PRO It takes a team!
INTERPROFESSIONAL PROJECTS PROGRAM