

City of Chicago Ordinances

1. Organic waste must be generated on-site.
2. All finished compost must be used on-site.
3. Composting must be conducted in-vessel (enclosed container with no openings greater than 1/4").
4. Activity must not create a nuisance, such as odor, noise, or vectors (insects and rodents).
5. A permit is required for meat, bones or fish, dairy products, grease, bread or legumes, and plywood content.
6. Approval must be granted for volumes greater than 10 cubic yards for landscape waste and 5 cubic yards for organic waste.

Comparison with Other Universities

Without a waste audit, the team researched into composting programs at universities to gain a sense of the size of their waste stream. Further investigation was completed on schools that were comparable to IIT (4,500 students). St. Olaf College, a private liberal arts college of 3,000 students, located in a small town of Northfield, MN, was selected as the benchmark to measure IIT against. St. Olaf College is recognized nationally as a leader in sustainable design and ecology. St. Olaf conducts in-vessel composting to recycle organic waste. On average, the university generates 2,500-5,000 lbs of organic waste per week. St. Olaf reduces its overall waste stream by 118 cubic yards per year through composting. Therefore, the team compared the data of St. Olaf against estimates from internal sources at IIT. With the implementation of organic waste recycling, IIT is projected to become one of the nation's leaders in food and recycling sustainability.

What are the benefits of composting?

Environmental

- Prevent emission of greenhouse gases
- Reduce waste stream
- Enhance soil's performance
- Eliminate the use of chemical fertilizers

Economical

- Decrease disposal costs
- Contribute to higher yields of agricultural crops

Social

- Reduce carbon footprint
- Promote sustainable living
- Reinforce waste as providing nourishment for something new

Sponsors and Contacts



Mission: "IIT to become the most sustainable, urban university campus in the United States." The Office announced its sustainability plan for IIT in April, 2009.



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Resource Center, a non-profit environmental education organization, has led the way in demonstrating innovative techniques for recycling and reusing materials.

Contact Information

IPRO 312: The Rotten IPRO

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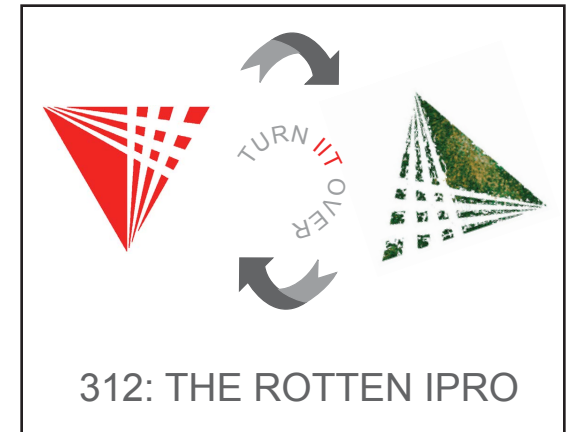
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IPRO 312

Commercial Scale Composting at IIT



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Problem Statement

IPRO 312: The Rotten IPRO will serve as consultants for the university on what is the best plan of action regarding organic recycling.

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 outside professionals within the recycling industry
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

What is composting?

Composting is fertilizing with a mixture of decaying organic matter.

Composting can be considered as biological decomposition, which occurs naturally when plants fall to the ground, slowly decay, and return nutrients to the soil. Composting involves accelerating the breakdown of materials by adding bulking agents (such as wood chips), oxygen, and water.

How can you help?

Be familiar with what can be composted.

cardboard	paper	wood chips
dairy products	leaves	cotton rags
coffee grounds	tea bags	grass clippings
vegetables	fruits	fats, greases, or oils
meat or fish remnants	dryer lint	egg and nut shells



In-Vessel Unit



Approximate Size 3 cubic yards/week capacity
13' long x 3' wide x 5'-3" high

How It Works

1. Load organic waste, including meat, fish, fruits, vegetables, and garden waste, on a daily basis
2. Continuous aerobic process uses a shaft to rotate material for air and water injection
3. Integrated systems monitor temperature, oxygen, and moisture and automatically control the process
4. Time span from organic waste to finished compost is 14 days
5. Finished compost is deposited directly into bags for ease of transport
6. Components of the unit are 100% stainless steel and require simple greasing and cleaning biweekly

Projected Cost Analysis

Initial Purchase: \$52,500

-includes delivery, installation, and 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

Technical 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, funding for the project became a concern.
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.

In-Vessel Composting

Determined as best solution based on

1. **City and State Regulations:** An enclosed container eliminates release of methane and odors and attraction of vectors.
2. **Projected Needs of IIT:** Method is appropriate to the volume of organic waste to be recycled and amount of maintenance required.
3. **IIT's Commitment to Sustainability:** Composting will reduce the university's waste stream and serve as an example of thinking globally by acting locally.

The Microbiology of Composting.

The biological degradation process of composting can be broadly described in terms of four stages of micro organism activity, characterised by different temperature ranges.

