



Auburn University 2025 Campus Race to Zero Waste Case Study

Contact information:

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Focus of Case Study:

Auburn University's Waste Reduction and Recycling Department student staff focused on implementing an organics recycling system in conjunction with the university's annual pumpkin carving competition to determine a simple means to recycle this material.

Detailed description of campaign or effort:

Beginning in September 2024, student staff began a project to showcase an organics recycling initiative. The objective was to perform a trial to assess if it was a viable means of recycling organics, specifically that of the annual pumpkin carving competition.

Organic Materials

The materials used were pumpkins and guts from the annual pumpkin carving competition and dry leaves from university grounds, courtesy of the Landscape Department. The ratio of leaves to pumpkins was roughly 2:1, with more leaves than pumpkins.

Johnson-Su Bioreactor

The method used for this study was a version of a Johnson-Su Bioreactor, which removes the need to stir or rotate the organic material due to ventilated pipes throughout the pile. This design allows the system to be low maintenance once the initial setup is complete.

A Johnson-Su bioreactor is a method for creating a beneficial, fungal-dominated compost. It achieves this by creating a static, aerated environment that encourages the growth of fungi and other microorganisms. The process involves building a structure (often a cage-like frame with perforated pipes placed within to facilitate airflow), filling it with organic material, and allowing it to decompose aerobically for an extended period (9 months or more) without turning.

Initial Setup

Student staff attached landscape fabric to a wire mesh container and gathered perforated PVC pipes. Following the pumpkin carving competition, bins with pumpkins and guts were collected and delivered to the bioreactor site, where the pumpkins were chopped into smaller pieces before being added. Layers of pumpkins and leaves were alternated.

Monitoring Reactor

Temperatures were taken daily for the first week, then once per week. For the initial heating, the desired temperature was 140°F-165°F. After that, the desired temperature was 80°F weekly for the cooling phase. The pile was also checked once a week to monitor the height of the material.

Planning steps and timeline to implement:

- September
 - Begin planning organics recycling initiative
 - Gather materials for bioreactor
- October
 - Construct bioreactor
 - Collect leaves
 - Collect pumpkins and guts
- November
 - Prep bioreactor for organic material
 - Break down pumpkins
 - Alternate pumpkins and leaves
- December - March
 - Monitor bioreactor
 - Collect data and note observations

Resources and stakeholders involved:

Budget

- Materials for the bioreactor were reused/thrifted from other departments
 - Wire mesh container, landscaping fabric, PVC pipe

Stakeholders and support

- Waste Reduction and Recycling Department
- Landscape Services
- Maintenance
- Materials Management
- College of Architecture, Design and Construction

Describe the results of this campaign component:

General Results

- Site was acquired
- Method was proven effective
- Organics from pumpkin carving competition were recycled

Specific measurable impact

- During these months, the height of the organics fell from 29" to 17", a 52% decrease
- Internal temperature rose from 40°F to 150°F eventually tapering to 80°F-85°F
- No adverse odors were detected

What would you do differently in the future?

- Determine an end use for the recycled organic material
- Set up a system to reduce the size of pumpkins

- Streamline methods of gathering materials
- Better engage the university in the program

What advice would you give to another college that wanted to do a similar effort?

- Ensure consistent and clear communication strategies
- Plan early and allocate resources efficiently

Photos and Graphics:

courtesy of Waste Reduction and Recycling



Wire mesh containers and perforated PVC pipe



Pumpkins and guts



Prepping bioreactor



Pumpkin Carve: source of pumpkins and guts



Alternating pumpkins and leaves



Overhead view of bioreactor



Noting observations



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