ENVS 4100: Appropriate Technology and Sustainability – Ecological Design: Campus as a Living, Learning Laboratory

WASTE NOT, WANT NOT: DINING HALL WASTE AS A LANDSCAPING TOOL

Authors and Contact Information:

Class Instructor: Dr. Harold Glasser

Annie Lilac – (269)312-0807 annie.e.lilac@wmich.edu

Chelsea Strating – (616)610-3513 chelsea.l.strating@wmich.edu

Introduction:

In kitchens around campus, there is a staggering amount of solid food waste produced every day. Past student research has found that a single dining hall can create over one ton of waste in just one day. Considering the eleven kitchens open each day on campus, this can lead to a monstrous yearly total. Instead of allowing all of this waste to end up in either landfills or wastewater treatment facilities, however, we propose reusing some of that waste in our landscaping practices – namely the spent coffee grounds (SCG).

Methodology:

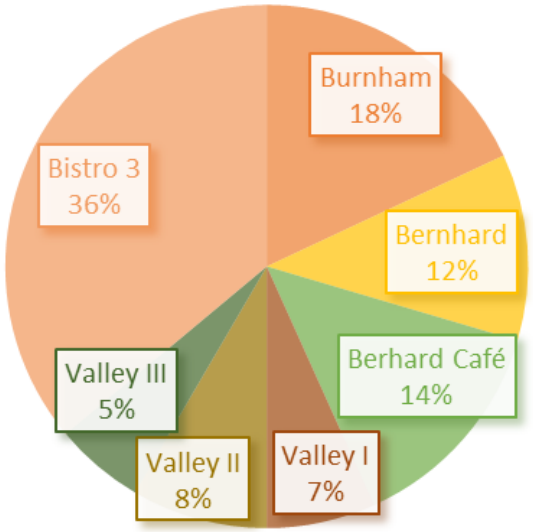
With this project, we set out to investigate the best way to sustainably put the SCG produced on Western's campus to use in landscaping. To begin, we performed extensive research on SCG uses in composting, soil enhancement, fertilizing, and pest control, then we set out to meet with the heads of dining services (Paul Choker) and landscaping (Tim Holysz, Steve Root, and Aaron Dykstra) to discuss what sort of undertakings would be feasible. It was determined that the best method to pursue at the present time is to directly incorporate SCG into the large stock of soil mix and act as a built-in natural fertilizer. Coffee grounds are a good source of nitrogen and several helpful organic compounds that promote worm activity and microbial growth.

Before we could start implementing any system of collection, however, we needed to understand the amount of SCG we would be working with on a daily and yearly basis. We performed a campus-wide survey of seven kitchens (Burnham, Bistro 3, Valleys I-III, Bernhard (Hoekje/Bigelow), and Bernhard Café) over the course of one full day. We were then able to weigh what was collected to get an accurate estimate of how much SCG is produced daily in each location and thus estimate the total amount produced on Western's campus over the course of a year.

SCG Production Evaluation:

Campus Kitchen	SCG Produced (lbs)
Burnham	7.5
Bistro 3	15.0
Valley I	2.8
Valley II	3.5
Valley III	2.3
Bernhard (Hoekje/Bigelow)	4.8
Bernhard Café	5.7

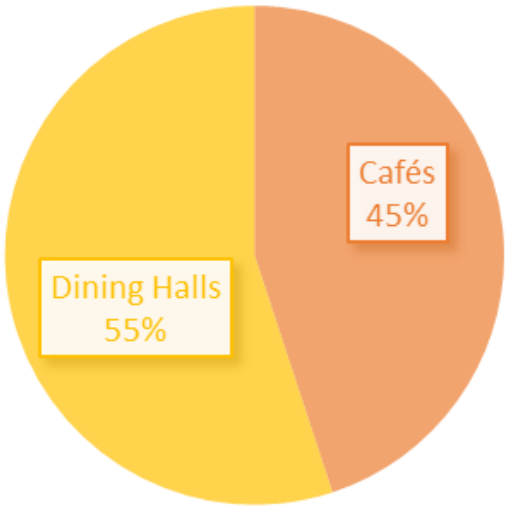
Distribution of SCG production for surveyed kitchens:



Approximate amount of SCG produced daily:

- Campus Cafés (6 total): 34.2 lbs
- Campus Dining Halls (7 total): 41.9 lbs
- Total Across Campus: 76.1 lbs

"Big picture" distribution of SCG production:



Approximate total amount SCG produced yearly:

- Campus Cafés (6 total): 8,650 lbs
- Campus Dining Halls (7 total): 10,380 lbs
- Total Across Campus: 19,020 lbs

Conclusions:

With the knowledge gained from our SCG survey and the great help from the heads of dining and landscaping, we were able to develop a pilot system for collection of SCG across campus. Every kitchen on campus has a large number of easily reusable containers from previous orders of bulk food. During the day, as the SCG are produced, dining service employees will place the grounds (disposable liner and all) into these containers, which can be sealed and stored beneath the coffee machines. When these containers are filled, they can be transferred to larger five-gallon buckets for storage in the back room until pick-up time. How often the grounds are picked up depends on the volume of grounds produced in that particular kitchen as well as the seasonality when the SCG are created.

Recommendations:

In the future, in addition to maintaining the system of SCG collection, we recommend performing a research experiment with the Gibbs House Permaculture Research and Demonstration Site to study the impacts of SCG as a top dressing on soil as well as its effectiveness as a natural pest control agent. Other potential effects to explore include: changes to soil pH and effects on microbial activity. This information can possibly be used in the future to expand the use of SCG from a simple organic soil mixture component to a top dressing that doubles as a fertilizer and an environmentally friendly pest control agent. With positive research results, these SCG might serve to replace some of the synthetic chemicals currently being used on many plants. This would likely save Western money, while decreasing the harmful effects that result from pesticide use.

In addition, we also suggest exploring the idea of setting up SCG collection services for both Gibbs House and the Community Garden if they express interest in utilizing some of the vast amount of SCG used on campus. The scale and frequency of such systems would have to be explored with trial runs and pilot programs.