

Vermicomposting of campus food residuals and waste at the Student Organic Farm, John Biernbaum, Department of Horticulture, Michigan State University, East Lansing, MI 48824

Michigan State University Office of Campus Sustainability and the Division of Residential and Hospitality Services initiated two projects in 2010 to investigate on campus recovery and recycling of kitchen preparation fruit and vegetable residuals and post-consumer plate scraping food and paper waste in residence halls. One project involves incorporating post consumer plate scraping waste into the anaerobic digester as the dairy composting facility. The second project is to process kitchen preparation fruit and vegetable residues using vermicomposting at the Student Organic Farm (SOF). Objectives of the vermicomposting project include:

- Demonstrate the importance of addressing long term nutrient removal from farms through the sale of produce by returning organic matter and nutrients to the farm through engagement of the local community. The transport of material to the SOF was done in coordination with delivery of produce from the SOF to the residence halls.
- Develop economically viable vermicomposting strategies for farms and community farming projects.
- Test the use of unheated hoopouses / high tunnel technology for maintaining vermicomposting in the winter.

A 30' x 72' foot high tunnel was constructed at the SOF to provide a research location. Red wiggler / manure worms were collected through the summer from horse manure piles at local farm and raised in containers. During the fall 2010 semester approximately 250 lbs of kitchen preparation residue was collected per week for 16 weeks for a total of 4000 lbs. The materials were precomposted after mixing with straw, leaves or wood shavings. The precomposted material was then added to the worm beds. The worm beds remained active and maintained a temperature of ~50°F in a single layer polyethylene unheated high tunnel with a second interior structure covering the bed.

Additional worms were maintained in 18-20 gallon plastic totes in heated greenhouses for the purpose of developing alternative winter maintenance strategies. A team of undergraduate students designed and implemented a feeding trial as part of a class project. Treatments included two food sources, horse manure and pulped post consumer plate scrapings, and two feeding rates (moist weights equivalent to 0.5 or 1 times the estimated worm population weight per day) added to the worm bins each week. Cultures provided horse manure increased from ~400 to ~600 grams while cultures provided food waste increased from ~400 to ~2000 grams over the 8-week period.

The project is continuing and as the worm population grows, the amount of kitchen residuals collected each week is increasing. Important issues such as managing fruit fly populations during warm weather still need to be addressed. As the availability of mature vermicompost increases the intent is to work with campus researchers to test the use of the vermicompost as a crop protectant and management strategy for insect infestations and disease infections.

