Campus Biodigester Demonstration Project

Beginning in November 2017, the University will operate a food waste composting system behind the Fitzrandolph Observatory. The demonstration-scale aerobic digester will convert 5,000lbs of campus food waste per week into a soil amendment for University grounds, while serving as a living laboratory for multi-disciplinary investigations into all aspects of food waste conversion.

See below for several research opportunities:

1. Not all compost is created equal. The bacteria and fungi profile and diversity can vary depending on the quality and type of inputs into the system. Test different input ratios of carbon to nitrogen (i.e. food waste) and/or different carbon sources (e.g. wood shavings vs. cardboard). Which combinations or sources result in finished compost that is most effective at...
   a. Removing toxins or other pollutants from the soil?
   b. Increasing the water holding capacity of soil/preventing erosion?
   c. Promoting soil carbon sequestration?
   d. Promoting growth and/or disease suppression of crops grown in the Forbes Garden or on campus farmland?
   e. Growing nutrient-rich and high quality fruit and vegetables?

2. Experiment with different compost teas and extracts. What compost : water ratio is best at protecting plants from fungus or diseases?

3. Test the feasibility of the aerobic digester unit in breaking down a range of bioplastics such as compostable diningware used at campus events.

4. Conduct a cost-benefit analysis of using finished compost from the aerobic digester relative to chemical fertilizers on the University’s athletic fields.

5. Develop an automated heating system that keeps the digester’s building at a minimum operating temperature during the winter (temp can’t dip below 40 degrees F for longer than 24hrs)

A similar food waste composting system is being built