



Clemson University 2022 Campus Race to Zero Waste Case Study

Contact info:

Lizzy Anast
Recycling Services
Clemson University
eanast@clermson.edu
864-650-8474

Focus of Case study:

This paper focuses on composting at Clemson University. Clemson Organics Recovery's dedication to education, innovation, and sustainability has made it a leading compost program in the southeast.

Detailed description of campaign or effort:

Clemson's program began as a student initiative and has expanded into a multi-departmental effort to capture organic waste from dining halls, sports arenas, academic buildings, and student housing. The program offers valuable industry-level learning opportunities to students and other community members and is a resource for colleges and universities looking to start or improve their yard and food waste recycling program. Education, innovation, and sustainability are core values of Clemson's program and are vital to its continued success.

Clemson Organics Recovery's emphasis on education and student involvement is an extension of its roots as a student-based research initiative. Clemson's composting program began in 2010-2011 as a multi-departmental Creative Inquiry (CI) involving graduate and undergraduate students that sought to practice composting firsthand. That CI and many similar projects have grown the program into what it is today. CIs remain an important part of Clemson's program as students research and develop projects like biodiesel, black soldier fly larvae, food waste reduction and recovery, and more. In addition to CIs, Organics Recovery partners with career services on campus to employ student interns. Interns help connect the community to composting in their time as a student and beyond.

The evolution of Clemson Composting's operations reflects the composting team's resourcefulness and innovation. During the fall semester of 2019, Clemson University collected and composted approximately 635,000 pounds of compostable products such as food waste, paper towels, and compostable wares. Diverting organic waste from landfill reduces Clemson's environmental footprint while providing economic and social benefits to the university and surrounding community. Clemson Organics Recovery is seeking partnerships with industry, universities, and faculty or student research projects to expedite the expansion and advancement of Clemson's program into a new facility that can accommodate post-consumer collections and provide a broader range of outreach and education services. Partners would



have an opportunity to collaborate with Clemson's composting team and utilize Cherry Crossing's resources to test new ideas and technology.

The program is an integral part of the university and surrounding community; it offers environmental, economic, and social benefits through waste and cost diversion, education, and contributing to local agriculture and ecology. Current and new partnerships are vital to growing the program, conducting research, and expanding into new territory.

Planning steps & timeline to implement:

- Sonoco FRESH (Food Research Excellence for Safety & Health) was established at Clemson University with generous philanthropic support from the Sonoco Foundation. Sonoco FRESH provided students the opportunity to participate in creative inquiries.
- As a Carnegie R1 research institution with a tradition of successful industry partnerships, Clemson offers access to resources that drive innovation. FRESH is able to build multidisciplinary faculty and student teams from throughout the university to develop new solutions for a more nimble, resilient, and circular value chain for food and packaging.
- In 2010, a group of students launched a creative inquiry to address food waste on campus.
- With the help of staff members Dave VanDaventer and Tom Jones, the 2010-2011 CI team received a \$25,000 grant from the S.C. Department of Health and Environmental Control and used it to fund an in-vessel composter.

Resources and stakeholders involved:

- Aramark – Clemson Dining: Aramark manages the food services for Clemson University. Aramark uses compostable items where possible for to-go services and coordinates with Organics Recovery for collections of compostable items and food scraps at dining halls, events, and athletic facilities. In the 2019-2020 school year, over 333 tons of food was captured and composted from the dining halls on campus.
- Student Organic Farm: Clemson University has an organic farm which is an educational small-scale platform for students. At the farm, Clemson compost is used for soil amendment instead of traditional synthetic fertilizers and pesticides.
- Musser Fruit Research Farm: Clemson's Musser Fruit Research Farm composts their fruit waste through Clemson's composting program, and in turn receives compost for the farm usage and long-term efficacy experimentation.
- SC Botanical Gardens: The South Carolina Botanical Garden is a diverse 295-acre garden. The Gardens use Clemson compost as potting soil amendment or ornamental garden soil amendment, and partner on community outreach projects.



- **Clemson Landscaping:** Clemson composting's primary source of carbon feedstock comes from campus landscaping. Coupling organic recovery with landscaping services has been crucial to the success of both programs in terms of cost savings and a secure and consistent carbon feedstock needed for organic waste processing.
- **Atlas Organics:** Atlas Organics, a commercial composter founded by a Clemson alumnus, leases the trommel (used to sift finished compost) from the University. Atlas helped Clemson innovate the aerated static pile method, which served as a proof of concept for Atlas Organics to receive approval from Greenville County to begin their commercial processes on a larger scale.
- **Sonoco FRESH:** The mission of Sonoco FRESH is to have a major impact on the reduction of food waste and examine the concepts of safe, secure, and sustainable packaging. FRESH looks at the food lifecycle holistically and identifies opportunities to reimagine processes, sciences, technologies, and behaviors for the greater good of society. Sonoco FRESH is a large part of the food waste reduction Creative Inquiry, and the sustainable packaging Creative Inquiry that will begin fall 2020.

Describe the Results of this campaign component:

- Clemson was able to create a thriving compost program that has been flourishing for over ten years. There is now a team of Clemson staff who are dedicated to operating the facility and collecting compost on campus.
- The year of inception, Clemson composted 23.7 tons of food waste. During the 2018-2019 school year the compost program was able to capture 606.56 tons of food that would have been sent to a landfill.

What would you do differently in the future?

Clemson is continuously looking to collaborate with new partners and is open to all opportunities. Clemson Organic Recovery is committed to maintaining its excellence in service to the operational needs of the university as the university grows, and partnerships will ease and expedite the process.

The vision for the future of the program is to procure a new site and develop a larger, more efficient facility with data integration. Improved data collection and controls will open doors for greater technical research opportunities and more precise operational management. A larger, more efficient facility would allow the university to process more material as it grows and expand capture into front of house or post-consumer collections.

Increased volumes of material will require a more comprehensive solution for the finished compost; using the compost in landscaping and selling it by the yard to local community members will not be enough to move the volume of compost that will be created. One possible solution is to use a soil bagging system to create bags of compost in volumes that are more accessible to the general public than bulk yard purchasing.



Regarding education and outreach, the program is planning to host tours, workshops, and trainings at the composting facility and grow its on campus educational presence through digital media and participation at in person events.

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

Student involvement is key! Students are tenacious. When they are involved in projects around campus, shorter timelines are created because they students want to see the project to fruition.

Never underestimate the power of a grant. Funding projects is always a challenge. There are so many grant opportunities are local, state, and federal levels that can take a help launch a program into its next steps.

Photos and Graphics:

Figure 1: Clemson Organics Recovery's Food Waste Capture Per Year (Tons)

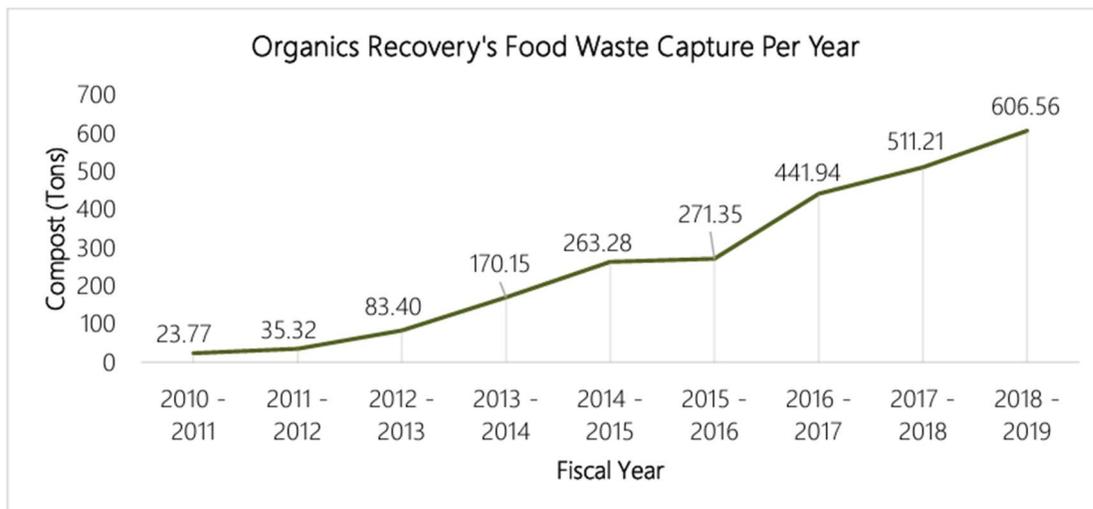
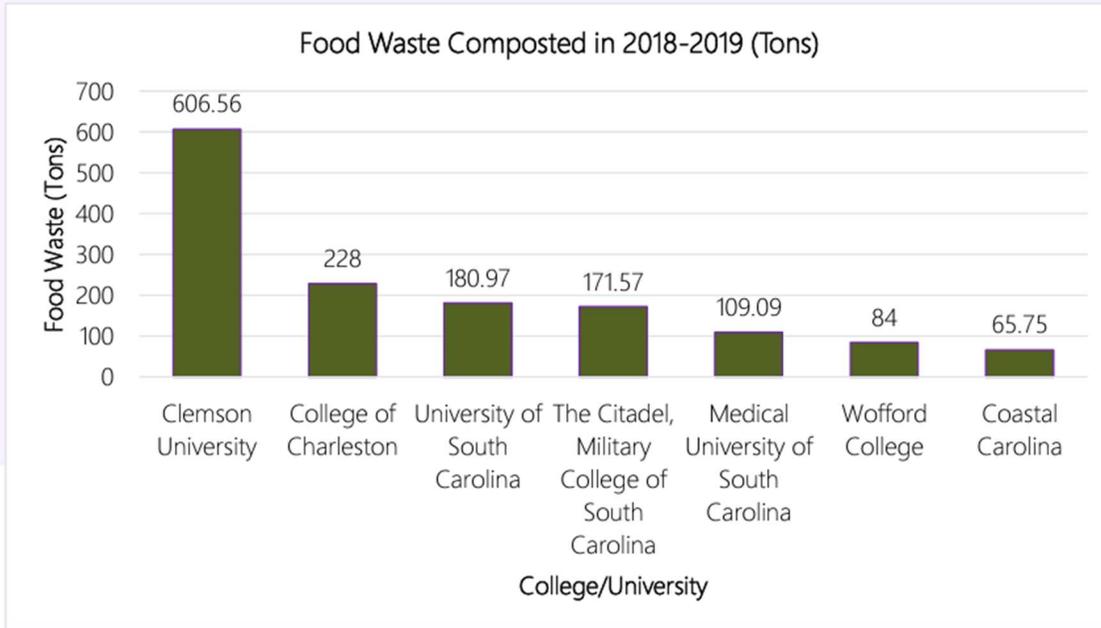


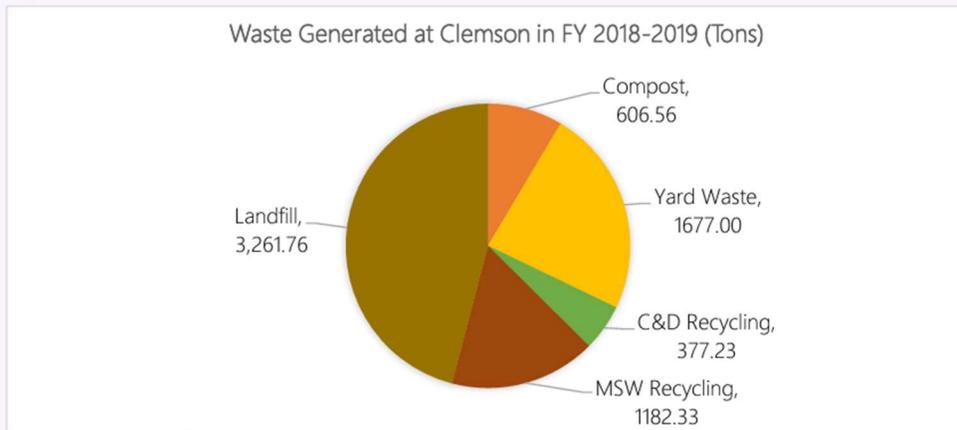


Figure 2: Food Waste Composted in FY 2018-2019 (Tons)



Based on data provided by SC DHEC

Figure 3: Waste Generated at Clemson in FY 2018-2019 (Tons)





All photos taken by: Callista Aurelia



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