

**Community Composting in the East Bay, CA:
Design-Based Research with Berkeley Student Farms**

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ABSTRACT

The Berkeley Student Farms (BSF) coalition is a dynamic network of garden and farm spaces throughout the UC-Berkeley campus and a major goal of BSF is food justice. BSF commits to growing food for nourishing Berkeley's campus affiliates, the East Bay community, and the overall ecosystem. To do so, we want to make sure that our plants grow in nutrient-rich soils. Compost applied to garden beds in the different BSF locations as well as other East Bay urban agroecology projects has been an important component to feeding the soils that in turn help feed the local community. Community Composting (CC), a type of decentralized composting, was found to be an important organic waste management strategy to employ locally in the East Bay amongst urban agroecology projects such as Berkeley Student Farms (BSF) and Acta Non Verba (ANV). ANV is a youth urban agriculture project in Oakland, CA which was used as a comparable study site for my research design and discussion. The existing centralized composting structure in California is limited in how much it can support the local community and not every East Bay resident currently has access to residential municipal composting. The BSF Community Composting project shows that decentralized composting models can support urban agroecology, design-based research, and food justice movements for various stakeholders such as UC-Berkeley affiliates (students, faculty, staff) and East Bay community members (local businesses, residents, and institutions).

KEYWORDS

Food systems, organic waste management, decentralized composting, urban agroecology, collective ownership

INTRODUCTION

It is estimated that the United States wastes between 30 and 40% of the food supply (U.S. Food & Drug Administration 2020). Much of this food waste is being sent to landfills, where it consequently creates methane emissions in an anaerobic environment. An alternative and cleaner solution to sending organic waste to landfills is to strengthen composting infrastructure, in which organic waste can be repurposed into a useful, ecologically friendly product and applied to land as a soil conditioner (Blum 1992). Converting food waste to compost and applying the soil amendment locally is a long-term solution for mitigating climate change. Based on findings in the Project Drawdown project, composting is a viable option for preventing methane generation in landfills, thereby reducing greenhouse gas emissions substantially and increasing carbon storage when applied to land (Hawken 2017). California prioritizes the diversion of food waste (and other organic waste) from landfills to be turned into compost as a useful soil amendment.

Community Composting (CC) is a cooperative and decentralized composting model. Focusing on small scale composting projects empowers the local recycling of food scraps and other organic waste (Platt et al. 2014). A decentralized composting model is not antithetical to the large-scale composting model, in fact, CC is paramount for promoting healthy composting practices at all scales (Bilsens Brolis and Platt 2019). Elected officials, local planners and community members are vital to a successful CC model, as their proactiveness supports a common goal “to reduce waste and improve their soils for climate resilience and local food production” (Bilsens Brolis 2019). A successful example of CC is in Cuba where a non-governmental organization focuses on agroecological practices (Williams 2017). One aspect of the organization is running a municipal urban farm that manages a composting program. This program has student volunteers who collect kitchen scraps around the local neighborhood, and those food scraps are an important ingredient in creating rich organic matter that are recycled back into the earth on the farm and grows more food to nourish the community (Williams 2017). CC efforts often encourage the participants to access free or low-cost produce from the farm where the composting operation resides. The small-scale composting project in Cuba is a beautiful example of creating a circular and sustainable economy for a local community, which I use for inspiring my own research objectives.

Aside from outside farm donations (i.e., food scraps) that can feed composting operations, on site farm material such as plant trimmings “can be composted and cycled into urban food

production instead of landfills” (McClintock and Cooper 2010). In the East Bay, California, the most widely used composting practice is putting organic waste in municipal city bins for processing to be done elsewhere. There is less awareness for how organic waste can pragmatically be processed locally in a way that has individual, ecological, and social benefits. My research makes the case for why decentralized community composting is a best practice for supporting local urban agriculture and complementing the existing centralized composting model in some parts of the United States, such as the East Bay, California. There is a lack of research on studying how the CC model can fill in the centralized composting service gaps in California while exploring all the co-benefits in ecological stewardship and community building that decentralized models can provide. Studying the social, ecological, and individual dimensions of organic waste management in urban settings are useful for identifying how community composting can best support urban agriculture (Jean-Baptiste and Giulia 2019).

To explore this research gap, my thesis asks: What are the benefits and challenges of Community Composting (CC) in an urban agroecological model? My sub questions are: (1) How are outside inputs delivered to composting sites; (2) is CC sufficient in providing consistent products and longevity to local urban agriculture; and (3) what are the behaviors and perspectives on CC individually and collectively, and is collective ownership an effective model? To answer these questions, I take a design-based approach with a student-led, ecologically minded and community-based organization called the Berkeley Student Farms (BSF) coalition. I also compare the benefits and challenges of implementing a community composting project at BSF site locations with another urban agriculture project in the East Bay called Acta Non Verba in Oakland, CA. In the design-based research approach, I as a researcher, along with additional BSF and community members, co-created the research methodology together “from conception to reflection” (Collins et al. 2004; Scott et al. 2020).

BACKGROUND

Centering Food Justice

The United States Department of Agriculture (USDA) has tracked food security for over two decades and a noticeable trend shows a continued gap in food security between people of color

and the white population (Coleman-Jensen et al. 2017). The USDA found that food insecurity rates for non-Hispanic Black and Hispanic households “were at least twice that of non-Hispanic white Households” from 2001-2016 (Odoms-Young 2018). In addition to the disproportionate effect of food insecurity on non-Hispanic black and Hispanic households, American Indians are another community in the United States that have been found to be more food insecure than their white counterparts (Odoms-Young 2018). In 2014, the THRIVE study found that about 30% of AI households experienced food insecurity compared with 16% of non-American Indian households, and in California 38.7% of American Indians were food insecure (Blue Bird Jernigan et al. 2017; Blue Bird Jernigan et al. 2016; and Blue Bird Jernigan et al. 2013).

Food justice empowers marginalized communities to have local access and control over their foodways choices. Rather than having limited access to fresh produce at a corner store, food justice activists and leaders are restructuring the food system to put community power and decision-making governance in local communities. Reimagining the food system at a local level works to upend the corporate controlled and inequitable food system. The current United States food system is a structurally unequal system that has led to health outcomes disproportionately affecting low-income and marginalized communities (Odoms-Young 2018; FoodPrint Organization).

Karen Washington, a Black woman activist from New York City who co-founded an organization that supports and advocates for Black leadership as well as Black farmers in the food movement, considers the lack of access to healthy food and resources a clear example of “food apartheid”, a term she coined (Woehling, n.d.). In 2008, the US Farm Bill defined “food desert” as being the areas where people lack access to healthy food, but Washington opposed this expression and prefers her term “food apartheid” because these locations have been cut off from access to resources through discriminatory practices that have allowed for social inequalities to exist for years (Brones 2018; World Food Policy Center, n.d.). Growing food locally challenges the “food apartheid” paradigm that stocks the unhealthy and processed foods on shelves and limits access to fresh ingredients in low-income communities (Hanna 2019). Local food movements center marginalized communities to ensure that those in need of food security can secure it.

Food Waste & Behaviors

More access to fresh foods can create food scraps that will have been disposed of. However, there are many ways to be resourceful and to minimize avoidable and unavoidable food waste. In a household food waste study from lower-middle class families in Brazil, “food waste” is defined as unintentional food loss in all stages of the supply chain from production to distribution to consumption, which are also all affected by shopping and cooking (“which are themselves embedded in contextual and cultural factors”) (Porpino et al 2015). Spreading awareness and educating people about effective fruit, vegetable, and other perishable food item storage practices can also help to reduce food waste (EPA 2020). Research has shown that about 64% of household food and drink waste is avoidable in the United States. A collaboration between the Rhode Island Food Policy Council and the Environmental Protection Agency found that about 40% of that avoidable food & drink waste is from too much being prepared or served, about 55% not being used in time, and 5% falling in the miscellaneous category (O’Donnell 2014).

Food Recovery Hierarchy

Consistent with all the research advocating for composting as a necessary practice to divert food waste from landfills, the Environmental Protection Agency has created a waste recovery framework that supports reducing the impact of wasted food by feeding the soil and composting (EPA 2020). The Environmental Protection Agency’s Food Recovery hierarchy ranks composting above landfilling as a preferred practice. The Institute for Local Self-Reliance describes the food recovery hierarchy with more detailed information on the different scales of composting. The Institute for Local Self-Reliance (ILSR) delineates the hierarchy from most preferred to least preferred as follows: edible food rescue, home composting, small-scale/decentralized composting, medium scale/locally based composting, centralized composting or anaerobic digestion, mechanical biological mixed waste treatment, and landfill and incinerator (Platt 2017).

Defining Centralized Composting

The California legislature has set the framework for a 75% green waste reduction of 2014 levels by 2022 by passing Senate Bill 1383. Nick Lapis is the Director of Advocacy for the non-profit organization called Californians Against Waste and believes that the bill's intent is to optimize the quantity of compostable waste that can be diverted from the landfill waste stream (Ricker 2019). Lapis mentions that he sees large-scale composting facilities and small-scale community composting programs being able to support one another and work in tandem to divert as much organic waste as possible from landfills and to mitigate the environmental impact of generating organic waste such as food waste and green waste (i.e., yard-trimmings).

Large-scale composting facilities are centralized systems, and as of 2018 California had more than 200 composting and anaerobic digestion facilities. The state needs to find creative ways to increase their composting capacity necessary for reaching the organics diversion rates as stipulated in Senate Bill 1383 (Coker and Ziegenbein 2018). One such way is to support more local composting initiatives, such as community and home composting. While large-scale centralized composting facilities can manage significant amounts of organic waste, they also require added transportation and energy sources. Recycling food scraps at a community-based level can teach sustainable composting methods as well as empower local communities to use the finished product in their own soils.

Community Composting (CC)

The Institute for Local Self-Reliance defines Community Composting (CC) as a local project that incorporates compost into the soil by directly engaging and serving the community in the process. Community Composting generates social capital and wealth locally, promotes inclusivity and empowerment, provides educational activities and the opportunity to green and beautify neighborhoods, improves local soil fertility and carbon sequestration efforts, and supports food justice work which stands up against the “food apartheid” paradigm (Bilsens Brolis and Platt 2019; Brones 2018). Community Composting projects have reduced food insecurity and uplifted marginalized communities across the United States. For example, in Baltimore, Maryland, the Institute for Local Self-Reliance has worked with the City to create Baltimore's Food Waste &

Recovery Strategy, which includes CC in its framework. There is residential and business participation in recycling and composting of organics and food scraps. Additionally, ample support exists city-wide for creating CC sites. The community composting model provides adequate compost training programs that ensure “equitable geographic distribution and affordability” and composts food scraps on site (BioCycle 2020).

The objective of my research study is to look at ways that Alameda County (located east of San Francisco and known as the East Bay), including cities like Berkeley and Oakland, can also implement successful CC programs. Alameda County, CA has many urban agriculture projects and has organizations like StopWaste who support community-based organic waste management, gardening projects and residents by making sure that some 800 cubic yards of Waste Management’s organically certified EarthCare Compost, that comes from the county’s organic waste, is distributed back to them each year (StopWaste, n.d.).

There is further opportunity for the local East Bay community to learn how to compost closer to food waste generation through CC programs rather than relying solely on the large-scale, centralized composting programs’ community initiatives such as the StopWaste and Waste Management example. CC programs can be set up in areas (i.e., at residences, small markets, and community gardens) that may not have easy access to municipal city composting. A decentralized composting model (the type of model that CC is) also reduces the greenhouse gas emissions and hauling costs that come from transporting waste materials long distances with the existing centralized composting infrastructure. For example, some of Oakland’s organic waste is hauled some 30 miles away to Novato. Aside from its climate change mitigation benefits, local CC efforts are an effective way to build community skills that generate a useful resource which nourishes local soils (Institute for Local Self-Reliance).

Introducing Study Site

The UC-Berkeley campus in Alameda County, CA is a participant in the municipal composting centralized model. The organic waste is collected and hauled to the Berkeley Transfer Station, and then taken to industrial composting facilities outside of the City of Berkeley and Alameda County. Rather than sending organic waste to be processed outside of the City of Berkeley and the East Bay, there are many campus gardens and green spaces that can benefit from

composting organic waste on site and using it as a local soil amendment. To explore ways to create a decentralized community composting infrastructure at UC-Berkeley, it is necessary to provide further background on the history of the university and the land it sits on.

UC-Berkeley is a land-grant institution that was founded in 1868 following the Morrill Land Grant Act of 1862. The Morrill Act gave “public” lands to each state that could be sold off to establish university endowments. This allowed for development and expansion at the expense of the local indigenous communities whose land was colonized. The UC system and many U.S. universities are benefactors of a legacy that has profited off stolen indigenous land (Centers for Educational Justice & Community Engagement 2020; Nash 2019).

A year-old coalition of campus gardens and green spaces called Berkeley Student Farms (BSF) believes in a present and future reality at UC-Berkeley in which people of all backgrounds can be ecological stewards of the land. In that vision, we strive to honor the original stewards of the land and center indigenous voices in the decision-making process. An example of centering indigenous voices is when we grow plants for Café Ohlone who’s owners and ancestors are native to the Bay Area. In the decision-making process for our harvest crop plan, we ask Café Ohlone what they want us to plant for them at the UC-Berkeley campus gardens.

Additionally, BSF works to create decentralized and abundant “food forests” at the university which help to decolonize the food system and provide an abundant supply of fresh and culturally relevant foods to the campus stakeholders (i.e., students, faculty, staff, and visitors) and to the surrounding community. Everybody deserves access to fresh and culturally relevant foods, and BSF has many community partners that share the common vision to make this a tangible reality on campus.

In addition to providing people with fresh food, while working with BSF I began to imagine how much potential there is to engage the garden space and volunteers in creating a more consistent composting infrastructure. By strengthening our composting infrastructure, we can also be more productive in diverting food and green waste that otherwise would go to landfill and transform it into a useful local product that we can then share with the community, like how we also share our harvested food. Given the values of BSF and given my active engagement in the coalition myself, I decided that BSF would be an ideal study population for testing the community composting model in the East Bay.

Study Design with Berkeley Student Farms

To determine the viability of a Community Composting (CC) model at UC-Berkeley with Berkeley Student Farms (BSF), I surveyed current food scrap composting behavior, food ware and food packaging choices, existing knowledge of composting programs, and interest in getting involved in a campus CC project amongst about 72 students, faculty, staff, and other community stakeholders in Berkeley, CA, between a Pilot Study Qualtrics Questionnaire (December 2020), three individual Faculty Interviews (February-March 2021), a BSF Community Composting Survey (shared with the BSF Slack and during a General Meeting in April 2021), a Compost Focus Group (seven people in attendance in April 2021), and three personalized interviews with students who are part of the BSF Community Composting project.

METHODS

Site Description

Berkeley Student Farms

Berkeley Student Farms (BSF) is a coalition of eight campus gardens around UC-Berkeley's campus. They include: (1) Student Organic Gardening Association (SOGA) – Walnut x Virginia Streets, (2) Oxford Tract (OT) – Agricultural Research land between Oxford and Walnut Streets, (3) Barker Garden (stewarded by the student-led Indigenous and Native Coalition) – Between the Barker Hall and Li Ka Shing campus buildings at the Hearst Ave / Oxford Street corner of campus, (4) Brown's Herb Garden – Next to Brown's Café, (5) the Multicultural Community Center Garden – Outside of the Martin Luther King, Jr. Student Union building, (6) the Fannie Lou Hamer Black Resources Center Garden – Located at an outdoor space of the Hearst Field Annex (see Figure 1 for a visual), (7) Clark Kerr Garden – Between Building 12 and the Clark Kerr Dining Hall, and (8) La Loma Rooftop (now called Bechtel Terrace Rooftop Garden) run by the Hispanic Engineers & Scientists organization.



Figure 1. The Fannie Lou Hamer Black Resource Center Garden. This figure shows the Fannie Lou Hamer Garden space at the Hearst Field Annex on the edge of campus next to Bancroft Way.

The Barker, Fannie Lou Hamer, and SOGA gardens all held composting workshops for the Agroecology in Action 2021 Spring DeCal. SOGA open hours were consistently held five days a week in Spring 2021 from the end of January to early May. We weighed the food scrap inputs brought to SOGA during open hours which were used to feed either the SOGA or OT compost piles. The BSF compost team of volunteers would bring some of the BSF food scraps to compost at the Oxford Tract hot compost system during the Spring 2021 semester and we would turn the active compost piles at least once a week for the semester.

Study Population

My study population was students, campus affiliates (including professors and non-faculty staff), and the city of Berkeley community participants (such as the Hidden Café who donated their coffee grounds). The study participants came to the campus gardens for access to green spaces, to drop off their food scraps, and/or partook in the creation of the Berkeley Student Farms Community Composting project.

Data Collection

Pilot Study Questionnaire

I distributed a survey to my UC-Berkeley contacts (including my professors, classmates, and BSF members) in December 2020 to learn about people's current involvement in composting food scraps (i.e., using municipal curbside/centralized composting collection services, community composting as a decentralized model, and/or home/backyard composting). This questionnaire took less than 5 minutes on average for survey respondents to complete. The quick and user-friendly format helped me to effectively gather data for informing the Community Composting (CC) model design.

Study Design

I employed a design-based research approach with the BSF coalition to co-create a community composting model at UC-Berkeley. We collected BSF Community Composting food scrap donation and involvement data from January to April 2021 and adjusted our model as needed. We initially started the community composting project in November 2020 and scaled up our project accordingly with stakeholder engagement and feedback. For example, we had initial food scrap inputs donated from BSF members as well as coffee grounds donated to us from the Hidden Café starting in January. Then in February I also started to incorporate food scrap donations from the Basic Needs Center (BNC) into the BSF Community Composting operations. Stakeholders in the CC project include BSF volunteers as well as campus and community affiliates interested in being part of our efforts and/or donating food scraps.

With the design-based research approach, our composting technique at SOGA and Oxford Tract (OT) ebbed and flowed based on the inputs we had to work with, as well as the available volunteers who wanted to participate in the Community Composting project with BSF (refer to Figure 2 for a visual of the OT composting site and Appendix D: Sample of Data Collection Notes for further understanding our composting operations and pile construction). To gain more cultural insight and perspectives from various stakeholders, I held semi-structured interviews with 3 people who donated food scraps and/or other input material (such as coffee grounds from cafés) to the

different campus farms/gardens and held a Compost Focus Group session online for anyone who was interested in participating. I also interviewed three faculty members from the College of Natural Resources on their perceptions of the Community Composting program and how they feel it can address access to green spaces, healthy soil, and food security on campus. These faculty members included: Professor Timothy Bowles who runs the Agroecology Lab on campus and whose graduate student, Coleman Rainey (Cole), I worked very closely with at Oxford Tract; Professor Elizabeth Hoover who is a new faculty member and a researcher in Native American food systems, environmental health movements, and community based participatory research; and Professor Kathryn De Master, who is an Associate Professor of Agriculture, Society, and Environment and a Faculty Lead for the Food Systems minor.

I also spoke with Cole Rainey in a meaningful semi-structured interview about the vision of Berkeley Student Farms and how CC can fit into the goals of the coalition. As mentioned earlier, Acta Non Verba (ANV) is a community partner with BSF and operates a community composting project of their own. BSF members, including myself, helped at the ANV composting site at the WOW Farm in West Oakland, and we were able to compare our findings there with our learnings from the BSF Community Composting project.



Figure 2. Oxford Tract (OT) Compost Piles 3 and 4 on April 20, 2021. This figure shows the finished compost from the Compost (1+2) & 3 Mixed Pile being harvested on the left and the active Compost Pile 4 heap on the right (in the third wooden frame). See APPENDIX D: Sample of Data Collection Notes, for further understanding our composting operations and pile construction timeline and outside input quantities.

Data Analysis

The data I collected allowed for a variety of perspectives from different campus and community stakeholders (including students, faculty, non-faculty staff, and other community members) on the rollout of the BSF Community Composting project. I did not want to ask questions in a way that allowed for my personal biases to be revealed in the questionnaire (sent out in December 2020 with 69 responses as of May 2021; see Appendix B for reference), and the BSF Community Composting survey (sent out in April 2021 with 17 responses as of May 2021; see Appendix A to review qualitative findings and Appendix C for data summaries on all of the survey questions), so I asked questions in a neutral manner. I chose to make both the pilot study questionnaire and BSF Community Composting survey quick and simple (one that took respondents less than 5 minutes to complete) to encourage more participation in the survey. An example of a question I asked in the BSF Community Composting Qualtrics surveys was on how people transport their food scraps to a BSF Community Composting site. My surveying approach using Qualtrics offered a quantitative methodology for collecting organic waste management behavior and composting participation amongst the study population while also asking open-ended questions for qualitative analysis.

RESULTS

The BSF Composting Survey on Berkeley Qualtrics showed that the largest number of respondents identified with the SOGA garden space at the Walnut and Virginia cross-streets at 39.0% (16 of the 41 total garden space selections) followed by Oxford Tract (OT) at 26.8% (11 of the 41 total garden space selections). Clark Kerr Garden (affiliated with Housing and Dining Sustainability Advocates) and the Fannie Lou Hamer Garden (affiliated with the Black Resource Center) were the next most selected garden spaces out of the 17 survey respondents (at 9.8% and 7.3%, respectively). See Appendix C, Q1, pg. 55 for the data summary on what garden spaces BSF Compost Survey respondents work in or feel connected with. They were able to select all the gardens that pertained to them.

Transportation and other logistics

The BSF Compost Qualtrics survey responses found that 50% of the transportation to the garden and farm sites is done by foot, 25% is done by bike (see Figure 4 for an example of this popular and sustainable transportation preference), 18.75% is done by car, and 6.25% by bus/public transportation. For the eleven survey participants who bring food scraps to be composted at a BSF composting site (being able to select all that apply), 8 of them responded that they deliver their food scraps by foot, 4 responded that they deliver the scraps by bike, 3 responded that they transport their food scraps by car, and 1 responded that they take public transportation (bus) to deliver their food scraps to a BSF site.



Figure 4. Modes of Transportation and Delivery Preferences. This community compost donator prefers to ride their bike to the SOGA location and carries their food scraps in a reusable plastic container.

Participants with the BSF Community Composting project (11 respondents who were represented in the BSF Composting survey) used a diverse array of packaging to transport their food scraps and other acceptable outside farm inputs in. The BSF Composting survey found that plastic bags to transport food scraps in had the most participants using them (22.2% of the total selections, 4 respondents), Paper bags and Biodegradable Products Institute (BPI) Certified Compostable bags each at 16.7% (3 respondents), OK Compost Home bags (TUV Austria Home

Compost Certification) at 12% (2 respondents), Plastic containers (non-compostable) at 12% (2 respondents), Glass storage containers (i.e., Pyrex) at 12% (2 respondents), Fabric bags at 6% (1 respondent), and compostable products (not sure what kind) at 6% (1 respondent). See Appendix C, Q13, pgs. 73 and 74, for further details.

Operational capacity

The amount of input donated, on-site farm material, and finished compost produced changes based on open hours donations and volunteer capacity/ season/ weather conditions (see Figures 5 and 6 for content on Cumulative outside-farm donated input in pounds over time). At Berkeley Student Farms, out of the eleven survey respondents who said that they were involved in the Community Composting project over the Spring 2021 semester, four individuals responded that they bring food scraps 4+ times per month, three individuals responded that they bring food scraps 3 times per month, three survey respondents estimated bringing food scraps twice a month, and one person estimated bringing food scraps to a BSF site once a month. Partnering with local entities such as the Hidden Café and the Basic Needs Center provided us consistent inputs such as coffee grounds and inedible produce, respectively, to add to our community composting project. We collected the weights (in pounds) for the outside farm inputs donated to BSF (and we distinguished whether we put the inputs in the SOGA or OT piles) and for the Mandela Grocery Coop's food scrap inputs donated to ANV. Input amounts and frequencies of organic waste drop-off differed based on community composting site locations and day of the year. There is a gap in organic waste inputs at the end of March 2021 because UC-Berkeley was on Spring Break then, so the community compost data collection also took a break for about 5 days.

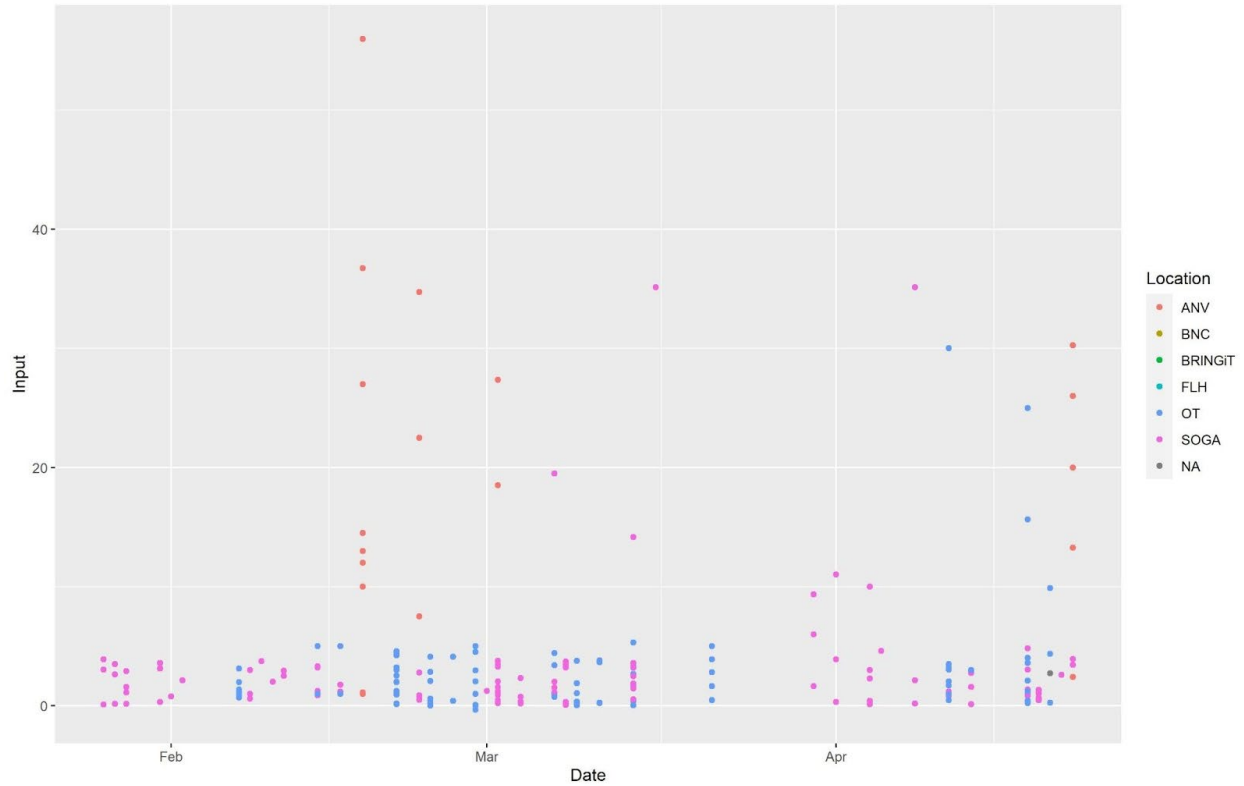


Figure 5. Unique Outside Farm Inputs (in lbs) over Time. We did not collect input data for Fannie Lou Hamer (FLH) as their 3-compartment composting system is still in development. For ANV we only collected full outside farm input data (from the Mandela Grocery Food Cooperative) for the second ANV pile.

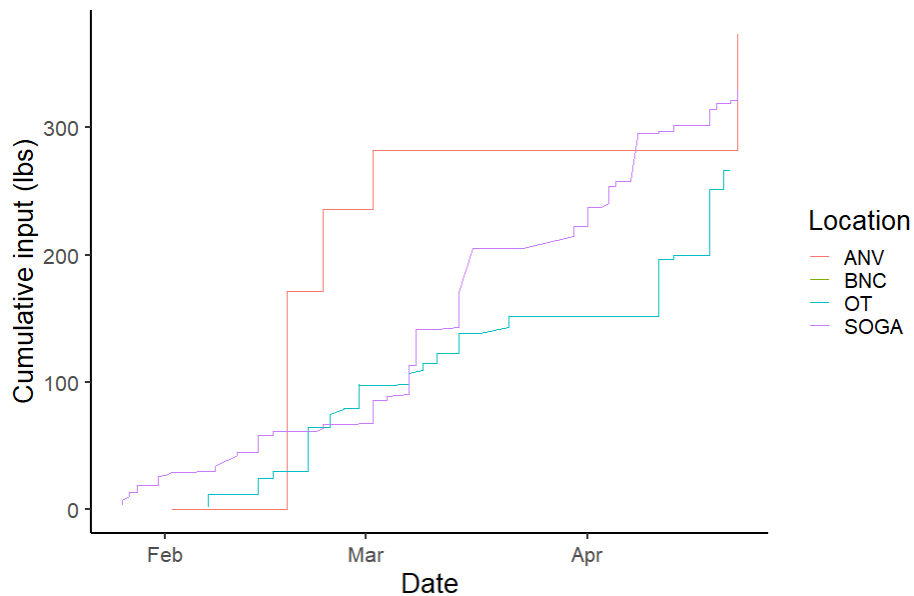


Figure 6. Cumulative input (in lbs) over time by Location. For ANV’s measured Cumulative input between February and April 2021, although other BSF volunteers and I observed and/or participated in the building, flipping, and harvesting of five piles, only ANV Pile 2 accurately has its Cumulative outside farm input represented in this graph. Reliable data collection also stopped for SOGA’s Sp3 and OT 4 in May 2021, although these piles have recently cooled down and are also in their curing phases (ready for harvest soon as the piles are below 100 deg F).

At ANV I only weighed the Mandela Grocery Coop food scraps, hay and chicken manure inputs that were added to one pile that I had constructed. I measured the finished compost output for one pile at ANV by weight, Oxford Tract (close to actual output weight for the combined 1, 2, and 3 Spring piles) and SOGA I estimated the harvest for the two piles that were in its curing phases in March and April, respectively. The third pile is ready to be flipped into the finished compartment and harvested this May.

At ANV the staff and volunteers performed four compost pile flips (to help in aeration and speeding up the decomposition process) before harvesting, while OT and SOGA had more sporadic flipping frequencies depending on the operational capacity during open hours on a given week. We did do more than four turns for each of the OT and SOGA compost piles (as SOGA had 5 open hour days a week and the compost team sometimes also flipped the compost pile at OT some of those days).

At OT and SOGA, we made finished compost in about a month for each of the piles. SOGA had the most comparable system to ANV out of all the BSF composting sites, as both locations had three 3-sided enclosed compartments (yet ANV managed more food scrap input from the Mandela Grocery Coop and therefore had three active piles going at a time versus one at each of the BSF locations participating in the CC project). SOGA and OT, the main BSF sites I studied for the CC project, were comparable in that they both had similar on-farm (plant debris) and outside-organic waste inputs (such as food scraps from student volunteers, the Basic Needs Center (BNC) and coffee grounds from the Hidden Café).

Compost was applied on the sites that it was created at, such as, SOGA and Oxford Tract (OT), and compost was also shared with other BSF gardens, the Hidden Café and community members who wanted to take some home for their own gardening. BSF locations were like other local urban agroecological projects with regenerative practices. A recent research article published by UC-Berkeley scholars on urban agroecological practices in the East Bay found that:

83% of farmers [reported] use of at least three soil building practices including cover cropping, no-till, compost and manure amendments, and crop rotation. The motivation for these practices comes from both desire to adopt climate-friendly practices, and a pragmatic need to amend and build poor urban soils allowing for crop productivity (Siegner et al. 2020).

The amount of time BSF volunteers devoted to gardening work each week also affected how much compost we were able to produce. The BSF Compost Qualtrics survey found that out of the 17 survey respondents, the largest number of volunteers (6 respondents or 35%) devoted 3-5 hours per week being physically present at the BSF garden spaces, followed by 5 respondents (29%) devoting 5+, 4 respondents (24%) devoting 1-3, and only 2 respondents (12%) devoting 0-1 hours per week to gardening work at a BSF location (refer to Appendix C, Q2, pg. 56 for visual Qualtrics results and further data summaries).

Based on my estimations, we harvested about 111 pounds of finished compost from SOGA's first Spring 2021 pile (in which there was about 67 pounds of cumulative outside farm input added between 01/26/21 and 02/23/21), 167 pounds of finished compost from SOGA's second Spring 2021 pile (in which there was about 138 pounds of cumulative outside farm input added between 03/01/21 and 03/16/21), and Oxford Tract's combined Spring 1, 2, and 3 piles had over 200 pounds of compost harvested with over 150 pounds of cumulative outside farm input. With a team of other BSF members and Marisa Johnson, the ANV Assistant Farm Manager, we harvested 142.5 pounds of finished compost from the first Spring ANV pile. We did not weigh cumulative inputs for all the piles, but we measured the outside cumulative farm input (from Mandela Grocery Coop and hay) for the second ANV pile which we found to be over 200 pounds.

Collective ownership model

I found that there was overwhelming affirmation for the Community Composting model at UC-Berkeley. Collective ownership is an effective model based on feedback from Berkeley Student Farms participants. I also gained insight from current program participants and community members on how we could improve our Community Composting project.

Qualitative analysis on Qualtrics

In the BSF Community Composting Qualtrics survey, I asked the survey respondents in Q14, "Would you want to start or continue to participate in a program to bring your food scraps to a campus garden for composting? Why or why not." The written responses can be reviewed verbatim in Appendix C on pgs. 75 and 76. Overall, 12 of the 17 survey respondents (70.59 %)

said that they would want to start or continue to participate in a program to bring their food scraps to a campus garden for composting, 4 respondents said they would want to participate in a composting program as it helps to limit waste and divert food scraps from landfill, 3 respondents mentioned that it would give them access to a composting program, 2 respondents touched on the benefit of composting as supporting the closed loop aspect of agroecological farming (i.e., “feed our soil which feeds our plants which feed us”, 2 respondents suggested that decentralized community composting is a tangible and empowering framework that is people-led (collectively owned) and positively contributes to the operations of shared garden spaces, 2 respondents mentioned that maybe they would participate but one has housemates who eat a lot of meat (not accepted in the BSF composting operations) and the other already has access to municipal composting, 1 respondent mentioned that they would be happy to participate in a community composting program but also processes food scraps in their home composting system, 1 respondent believes that the BSF community composting program helps to increase their awareness of food consumption and waste behaviors, and 1 respondent emphasized that composting is a simple process that is important. My thesis mentor, Kate O’Neill, wrote an advanced review on the circular economy, waste prevention and recycling, which also explored the relationships between food consumption, waste, and composting behaviors (O’Neill 2019).

In the survey, I also asked the respondents in Q19: “Is there anything specific you envision for how the Community Composting at BSF project can be run?” Their responses can be reviewed verbatim in Appendix C on pg. 78, but some memorable responses are to: coordinate “specific pickup/drop-off sites for food scraps” around Berkeley to make the program more accessible (two respondents suggested this), promoting the composting system as a place where people can harvest their own compost for their home garden for free, “ask the community for the scraps/make it more widely known,” and partnering “with living spaces like co-ops to collect their food scraps.”

Qualitative observations and conversations with the BSF coalition

From onsite observations and data collection, it is noteworthy to mention that a house of twelve students donated 25+ pounds of food scraps twice to the BSF community composting project (one time we put the scraps in the SOGA Sp2 pile and the other time we put them in the OT 3 pile). As a food recovery intern for the Basic Needs Center (BNC)’s Food Pantry, I also

recovered moldy produce from going into the municipal compost bin as I wanted to keep the resources closed loop and use these scraps to make healthy compost that would then feed the plants that we grow for the BNC.

The BSF Compost Focus Group held in April 2021 had seven individuals in attendance. Christine Haggin, a fellow BSF community composter, was part of the Fall 2020 ESPM 118 Agroecology team who did their final project on building a “Hot Composting” system at Oxford Tract with Griffin Walsh and Robert Symens-Bucher, and wanted us to expand on the inception, purpose, and evolution of the community composting project for newer participants in the BSF community composting project to better understand the context. We discussed the process of how our community composting system works in the focus group and clarified why we ask for donated food scraps and collect coffee grounds from a local coffee shop to support a closed loop ecosystem and to activate the decomposition of our compost piles. Ameia Smith, one of the Fannie Lou Hamer (FLH) Garden Managers, also added:

That is also part of the reason why it was important for us to get a compost system going at Fannie Lou as well. And something that we talk about a lot is if we're not practicing sustainability in our agriculture, we're practicing exploitation of the land, and humans make it seem like there's no other way, but there is, and so as long as we're on this land and using it, and wanting to reap its benefits, we have the duty to also actively give back to it, and so it's like a give and take. And that's why compost is important to me/us. And then also on a practical level, this is how we heal the soil, you know, and going into Fannie Lou, at least, I know, we were looking at some rough soil, and we were worried about how things were going to grow, and compost is transformative, and completes life and death and everything in between. Compost is what we owe to the land.

Quantitative analysis on Qualtrics

I asked survey respondents if they could list what BSF projects they are currently involved in and I invited them to be as general or specific as they wanted to be. Of the 17 respondents, the responses include the following projects in which the size of each word generally represents its frequency of being mentioned across respondents, and the Qualtrics survey software created a word cloud for response organization as can be seen in Figure 7.



Figure 7. Word Cloud for BSF Member Involvement. The sizes of each word indicate the number of participants who identified project involvement for different activities.

For the Qualtrics BSF Composting Survey Q6 (what types of organic waste do you personally recycle in the green waste city bins?), vegetable trimmings and paper products were the most common materials dropped into municipal compost bins, followed by plate scrapings, fruit trimmings, breads & grains, eggshells, coffee grounds/tea bags, soiled cardboard, and BPI certified compostable materials (see Appendix C, Q6, pg. 60 for the detailed Qualtrics data summary).

When asked what organic waste the BSF survey participants bring to the community composting project, all eleven community compost participants said that they bring raw fruit and veggies, seven said that they bring eggshells, three said that they bring coffee grounds/tea bags, two said that they bring breads and grains, and one respondent said that they bring soiled paper products. Based on the survey responses, it was estimated that 27 people contribute food scraps to BSF, whether they are the ones who physically donate the scraps to the BSF location or partner up with other people who do (see Appendix C, Q10 and Q11, pgs. 69 and 70, for the detailed Qualtrics data summaries).

Agroecology and food justice

Throughout the interviews I had with various campus stakeholders, there was a consistent trend in support of promoting agroecological practices. There was widespread interest in expanding on Berkeley Student Farms' community composting model and there was agreement that sustainable urban agroecological practices, such as composting organic waste locally, can enhance the soil that allows humans to grow culturally relevant foods which in turn feeds themselves and their communities. These findings are also supported in the literature. (Deaconu et al. 2021).

DISCUSSION

This study found that the benefits of community composting are multi-faceted and universal yet unique to different groups. The logistical and operational frameworks can be improved by uplifting sustainable practices in designing community composting programs such as making drop-off/pick-up sites for organic waste collection or finished compost sharing more accessible and locally sourced, also educating people on the importance of food waste reduction and integrating people's unique backgrounds and talents to strengthen the collective ownership model.

Logistics and environmental costs

The findings indicate that the more sustainable modes of transportation, walking and biking, were selected a total of 12 times amongst the 11 survey respondents who said they bring their food scraps to a Berkeley Student Farms (BSF) composting site, while a less sustainable means of transportation (by public transportation) was specified once, and the least sustainable means of transportation (by car) was selected only amongst three respondents. The results suggest that a more sustainable mode of transportation (by foot or bike) was selected 4x more in the survey than a less sustainable option was (by car or public transportation).

A review by Siegner et al. 2018 finds that composting is one of the most sustainable options in reducing urban food systems' GHG emissions. This supports my findings that more sustainable

modes of transportation can happen locally. For example, it is easy to motivate oneself to walk their food scraps less than a mile away if the location they were going to for participating in a community group also offers a community composting service. My findings and Siegner et al.'s review indicate that local composting projects is a best practice for cities to entertain. I also find this review to be useful as it was written by a Berkeley graduate student and two faculty members who are well-versed in food systems and urban agriculture work in the Bay Area.

The findings from the Qualtrics survey and the BSF Compost Focus Group suggest that more drop-off locations closer to where students live may encourage greater participation and convenience in the BSF Community Composting project. These findings are consistent with what was recommended in the literature to improve upon the logistics of community composting such as identifying food waste volume hot spots in urban areas and designing community compost projects that have “drop-off centers or arranged pick-up service” in these locations” (Ai and Zheng 2019).

Community composting in urban agriculture

The individual, ecological, and social dimensions of organic waste management are useful for studying how community composting efforts can support urban agriculture (Jean-Baptiste and Giulia 2019). The Jean-Baptiste and Giulia paper describes the individual dimension as being how inhabitants' composting practices allow humans to de-alienate themselves from nature, the ecological dimension as being “short-loop recycling by studying the local material flow of biomass and by distributing compost to participants or other users”, and the social dimension as being “the decommodification of land, food, and labor.” My findings indicated that all three of these dimensions were satisfied with the design-based research methodology that was employed, and I expand on these dimensions as they were discussed throughout the various interviews with campus stakeholders.

Individual

In our conversation in March 2021, Elizabeth Hoover mentioned that having recently moved to Berkeley she was under the impression that food waste was not allowed to go in the green municipal compost bin because her bin says, “Green Waste Only” so she assumed that food

scraps were not accepted in the bin. When Professor Hoover lived in Rhode Island she says she would bring her food scraps to the local farmer's market to be composted locally. I also asked her how the Mohawk indigenous community manages organic waste in northern New York, and she told me that resourcefulness is important to the tribal community and nothing would go to waste, so if part of a harvest could not be eaten, it would be composted rather than go to landfill. Professor Hoover and I agreed that it is very important for communities such as the East Bay to keep people up to date on current organic waste management policies and available composting programs so that people can practice resourcefulness and sustainable living, rather than contributing further to climate change by sending vital nutrients to the anaerobic conditions of landfills.

In an interview with Tiena Elias, a compost enthusiast and member of Berkeley Student Farms, she mentioned that having grown up in Alameda County and being the daughter of a geologist, from a young age she learned about the importance of composting food scraps. She has a vivid memory of her elementary school in Alameda, CA organizing a composting program in the school before it was common to do so, and lunch monitors would stand by the trash to direct people's food scraps to the compost bin. We agreed that teaching people how to get into habitats such as recycling organic waste to be turned into healthy compost amendment to feed local soils is important to be taught to children from a young age. Being very involved in Berkeley Student Farms, Tiena is excited to be part of the CC project and she hopes that it expands and becomes a helpful and enriching experience for many students and community members.

In speaking with another compost enthusiast at Berkeley Student Farms, Kalana, I asked her why composting is important to her and why she feels so connected to the practice? She responded that it was a friend of hers growing up in San Diego who inspired her to learn more about home composting in high school. Before coming to UC-Berkeley in 2021, Kalana would encourage her family at home to compost their food scraps and she would collect and transport the family's food scraps to be composted locally in her friend's home compost system. This is a great example of how one individual's or family's behavior can positively influence another member and/or family within a local community to also adopt sustainable practices and learn more ecologically friendly behaviors.

Ecological

Professor Timothy Bowles, a faculty member of UC-Berkeley's College of Natural Resources and Principal Investigator at the Agroecology Lab, mentioned in our conversation together how his research has focused on the impacts of compost use in California's vegetable agricultural systems. His technical research approach can educate community members such as students and farmers on how nutrients become available from compost to the impacts of compost on soil organic matter (T. Bowles, *personal communication*). As Professor Bowles has professional experience on the kind of applications of compost and a more personal experience on the actual composting process, he offers a unique perspective on the benefits of compost in an agroecological system such as Berkeley Student Farms (Bowles and Klein 2020). Professor Bowles happily supports the community composting work that undergraduates like me have co-created this year at sites such as SOGA and OT, with the added support from Coleman Rainey (Cole), his PhD candidate.

Social

During my interview with Professor Kathy De Master (Kathy), we focused a lot on the potential social benefits and organizational considerations for implementing a successful CC model at UC-Berkeley. Professor De Master acknowledged that she has some knowledge about Berkeley Student Farms and that she is in contact with Cole and some other folks who have been working on that initiative. Kathy helped me distribute the Pilot Study Questionnaire survey (the results can be reviewed further in Appendix B) to a class I took with her in Fall 2020 called ESPM 155AC, Sociology and Political Ecology of Agro-Food Systems. Kathy mentioned that over the years, especially in the ESPM 155AC class, "students have conducted projects about composting and have been very interested in getting [a more robust and local composting program] going on campus." She also recommends the campus transitioning to a more comprehensive organic waste management plan for dealing with both food sourcing and food waste because her understanding is there being an enormous amount of food waste that occurs at the food service outlets around campus, and she is not sure how well that is all being composted, where it is being done and so on. It was found that restauranteurs in Berkeley, CA do at times put food scraps in landfill even with a municipal composting bin available to them (Moreno et al 2020). Kathy thinks that it would

be “great to have some sort of integrated system on campus that is connected to these [Berkeley Student] Farms,” which could discourage campus eateries from improperly disposing of their waste.

Collective ownership model

Berkeley Student Farms (BSF) takes an approach to community composting that parallels the structure of the overall coalition, in that we practice a nonhierarchical model. Based on the classification of Community Composting Groups (CCG) described in the Slater and Aiken 2015 paper, we would be classified as a Type II-land activities + composting CCG in that we are: small scale composters (<30 tpa, where 1 metric ton ~ 2200 pounds, and tpa is tonnes per annum); our main activity is land-use and education; our source of material for composting is from on-site organic waste, [business donations such as coffee grounds from a local cafe and inedible raw food scraps from the food pantry], and householders bring to site; a group that consists of mainly volunteers (and sometimes a small number of staff like what we have for planned for Summer 2021); located in an urban environment; and we truly value training + education programs (Slater and Aiken 2015).

ANV used their finished compost to help organically fertilize their greens (that they sell to restaurants) at the WOW Farm site location in West Oakland, a few blocks away from the Mandela Grocery Cooperative. The WOW Farm will also be open in the summer to teach urban agroecological practices to campers, and they will be able to directly engage with the community composting project on site. In addition, ANV is a recipient of the California Alliance for Community Composting and CalRecycle’s Community Composting for Green Spaces Grant program, so will be getting additional support from experts on how to improve upon their existing community composting program (M. Johnson, *personal communication*).

Over the course of Spring 2021, the on-farm application of the BSF compost at different locations such as the Oxford Tract and SOGA helped to build up soil nutrients and teach students about agroecological practices. BSF will also continue to develop their community composting project further and are a member of the California Alliance for Community Composting. The five BSF summer agroecology managers will work together to strengthen our skillset and refine our

community compost model accordingly to best support our shared vision with the Basic Needs Center of food security for UC-Berkeley community members, faculty, staff, and students.

Synthesis

In synthesizing my findings from each sub question, I can confidently conclude that the benefits of CC at Berkeley Student Farms and in the East Bay's urban agroecological model outweighs the challenges. As described in the results and discussion sections, outside inputs are delivered to the sites sustainably with walking and biking as popular modes of transportation. A popular approach to bringing food scraps to the BSF site locations is also in either paper or OK Compost Home bags, which are both material inputs that we can process in our community composting piles with the food scraps, coffee grounds, and other on-site organic waste inputs. Based on my analysis of the BSF community composting operations and from feedback from students, professors, and other community members, I believe that the CC model that we have been co-creating this academic year is sufficient in providing consistent products and longevity to local urban agriculture.

Berkeley Student Farms “prioritizes movement building, meaningful inclusion, and equitable distribution of food, land, and knowledge through collective action and resistance” by utilizing “ecological land management to create a network of sites dedicated to anti-oppression and student basic needs, in order to produce thriving safe spaces for experiential education and food justice in the Bay Area” (Berkeley Student Farms 2021). Based on BSF's values, the vision and implementation of BSF's Community Composting project as a collective ownership model is effective and has a comfortable home within the framework of the coalition. Coleman Rainey, the graduate student who operates OT's Agroecology Farm and one of the early members of the BSF coalition, emphasizes the importance of supporting an agroecological model in my interview with him and he believes Community Composting is an effective and tangible approach that we as students can take in doing so. Cole considers the BSF coalition and farming to be a beautiful opportunity for connecting with nature and giving back to the land even in the urban environment that we find in the East Bay; he wants other people to also discover the magic of being ecological stewards of the land, and he thinks local composting efforts is a means to do so.

Limitations

At the beginning of the semester, Griffin Walsh, a fellow undergraduate agroecological researcher, and I wanted to keep the Berkeley Hot Compost method at Oxford Tract going so we had the goal to flip the compost heap about 2-3 times per week. As the semester progressed, it was harder to flip consistently at Oxford Tract, and a lot of the compost work and food scrap inputs was done at SOGA. My project was limited in scope in terms of the precision I was able to give to the data collection component of my thesis. Although I collected a lot of data between the weight of outside farm inputs donated to the community composting project, tracking the temperatures of piles, and the turning frequencies, the schedule of tracking these metrics was not consistent. For example, although the ESPM 197 student and I were reliably at SOGA open hours to collect people's organic waste on Tuesdays, Thursdays, and Sundays and were able to collect additional metrics such as tracking the temperatures of the compost piles, noting when the piles were turned, and when the finished compost was sifted, we also were not on site during every open hours slot so we could have missed some data collection of food scrap weights, turning frequency, and observations on the utility of the finished compost.

Future Directions

Although my research methods and sub questions do not directly address environmental justice (EJ), EJ is a shared value amongst many community composters, including myself, and “‘hot spots’ of [food waste volume] could serve as the anchors of food recovery locations, instead of contributing to environmental injustice” (Ai and Zheng 2019). Identifying “‘hot spots’ of [food waste volume]” can directly help improve the food recovery goals in Berkeley amongst groups such as the Basic Needs Center (BNC) and Berkeley Student Farms (BSF). For example, there is a lot of excess food at Cal Dining, some of which gets donated to and recovered by the BNC's Food Pantry at UC-Berkeley, and further developing the logistics and operations for food recovery locations is something that the BNC is currently working to improve.

This idea of food recovery also directly relates to Berkeley Student Farms because some of the food cannot in fact be recovered and if it is raw and uncooked foods, like moldy veggies for example, these can be brought to BSF and composted locally in our community composting

system. The Ai and Zheng paper states, “to achieve efficient and effective [Food Waste Management] through economies of scale, it is important to set up various levels of collaboration among different waste generators in a community” which is a model the BSF/BNC partnership seeks to strive for every day. The Berkeley Food Institute’s report on “Building Equitable and Inclusive Food Systems at UC Berkeley” also mentions future research needed on campus food waste. I recommend that the existing participatory foodscape mapping work at UC-Berkeley integrates food waste volume into its research which can provide recommendations for food to be better distributed, less food to be wasted, and inedible food scraps to be recycled locally (Fanshel et al. 2018). While mapping food procurement and waste on campus is identified as limitations in the case examination of the Foodscape Mapping Project at UC-Berkeley, the case study also states, “these limitations as helpful for student learning through focused, deep-dive engagement” (Fanshel and Iles 2020). The design-based research approach I took with students in helping to co-create a community composting project with Berkeley Student Farms can similarly be applied to the Foodscape Mapping Project. Design-based research can help students study the movement of food waste between campus organizational affiliations such as the Basic Needs Center (BNC), Cal Dining, and Berkeley Student Farms (BSF).

The community composting model has not been thoroughly researched in California nor Alameda County based on my literature review findings, and while my research on community composting in the East Bay adds insights to the existing literature and is place-based within a US urban area, I hope this work inspires more studies to focus on researching the strengths and challenges of the decentralized composting model in US cities. A research question that I did not explore but would like to in the future is the accessibility of the community composting model and studying approaches that community composting model can take in better supporting marginalized, historically disenfranchised, and displaced communities, such as the Muwekma Ohlone tribe whose land UC-Berkeley sits on (Centers for Educational Justice & Community Engagement 2021; Muwekma 2021).

Broader Implications

While I found research literature about decentralized composting models in different cities around the world especially in Europe and Canada, such as Rennes, France and Montreal, Canada,

adequate research on the decentralized composting model in U.S. urban areas is lacking (Adhikari et al. 2010). Living in an urban environment such as the East Bay, CA, gave me the opportunity to study a decentralized composting system in a region that also has an existing centralized composting framework.

In the Bay Area's urban and suburban environments, we have more centralized composting infrastructure than the average U.S. cities based on information provided in the Environmental Protection Agency's Excess Food Opportunities Map (EPA 2021). Even with this infrastructure, there continues to be residents that do not yet have access to municipal composting services, and decentralized composting hubs have great potential for filling this gap in the limited operational capacity of the existing centralized composting infrastructure in California. Educating communities about how to reduce their food waste and recycle what they cannot glean through the process of local composting efforts is a beautiful way to support a closed loop and regenerative organics recycling model in community hubs across the country.

Composting is a complementary practice to other agroecological behaviors that can strengthen urban agriculture within a community. Even on a small-scale, composting has been proven to support local communities. A study on community composting practices in the United Kingdom found that about two-thirds of groups surveyed were small scale projects and composted between zero and thirty tonnes per annum (tpa) (Slater and Aiken 2015). In the case of my research, studying urban agriculture in the East Bay, CA through the lens of decentralized composting, shows how much potential the practice of composting has for supporting local and sustainable closed-loop infrastructure. The partnerships between BSF and East Bay residents, community members, and fellow urban agroecological organizations such as ANV, are local examples of employing the food waste hierarchical practices and supporting regenerative food systems, which I hope sparks inspiration for more community composting hubs (decentralized organic waste management systems) around the United States.

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REFERENCES

- Adhikari, B. K., A. Trémier, J. Martinez, and S. Barrington. 2010. Home and community composting for on-site treatment of urban organic waste: perspective for Europe and Canada, *Waste Management & Research: The Journal for a Sustainable Circular Economy* 28:1039–1053.
- Ai, N., and J. Zheng. 2019. Community-based food waste modeling and planning framework for urban regions. *Journal of Agriculture, Food Systems, and Community Development*, 9:39–58.
- Alken, A.H., and J. Agyeman, editors. 2011. *Cultivating Food Justice: Race, Class, and Sustainability*. The MIT Press.
- Berkeley Student Farms. 2021. <https://www.studentfarms.berkeley.edu/about>.
- Bilsens Brolis, L. 2019. Community composting done right: a guide to Best Management Practices. Institute for Local Self-Reliance. Article retrieved from, <https://ilsr.org/composting-bmp-guide/>.
- Bilsens Brolis, L., and B. Platt. 2019. Community Composting Done Right: A Guide to Best Management Practices. Institute for Local Self-Reliance. Report retrieved from, <https://ilsr.org/composting-bmp-guide/>.
- BioCycle. 2020 June 22. Community Composting Key In Baltimore’s Food Waste Strategy. BioCycle.net. Retrieved from, <https://www.biocycle.net/community-composting-key-in-baltimores-food-waste-strategy/>.
- Blum, B. 1992. Composting and the Roots of Sustainable Agriculture. *History of Agriculture and the Environment*. *Agricultural History* 66:171—188.
- Blue Bird Jernigan, V., M.S. Wetherill, J. Hearod, T. Jacob, A.L. Salvatore, T. Cannady, M. Grammar, J. Standridge, J. Fox, J. Spiegel, A. Wiley, C. Noonan, and D. Buchwald. 2017. Food Insecurity and Chronic Diseases Among American Indians in Rural Oklahoma: The THRIVE Study, *American Journal of Public Health* 107:441–446.

- Blue Bird Jernigan V, K.R. Huyser, J. Valdes, and V.W. Simonds. 2016 Food insecurity among American Indians and Alaska Natives: a national profile using the Current Population Survey–Food Security Supplement. *J Hunger Environ Nutr.* 107:1–10.
- Blue Bird Jernigan V, E. Garrouette, E.M. Krantz, and D. Buchwald. 2013. Food insecurity and obesity among American Indians and Alaska Natives and Whites in California. *J Hunger Environ Nutr.* 8:458–471.
- Bowles, T., and A.O. Klein. 2020. Assessment of nitrogen flows on diversified organic farms: a road towards enhancing soil health from the ground up. Final Report.
- Brones, A. May 2018. Food apartheid: the root of the problem with America's groceries. *The Guardian*. Retrieved from, <https://www.theguardian.com/society/2018/may/15/food-apartheid-food-deserts-racism-inequality-america-karen-washington-interview>.
- CalRecycle. 2020. Project Summary, Grants By Grant Cycle by CalRecycle.xlsx. Retrieved originally from, <https://www.calrecycle.ca.gov/climate/grantsloans/communitycomposting>.
- Centers for Educational Justice & Community Engagement. 2021. Berkeley sits on Ohlone land. <https://cejce.berkeley.edu/ohloneland>.
- Centers for Educational Justice & Community Engagement. 2020. The University of California land grab: a legacy of profit from Indigenous Land. Retrieved from, <https://cejce.berkeley.edu/uc-land-grab>.
- Coker, C., and J. Ziegenbein. March/April 2018. California Composting. BioCycle: The Organics Recycling Authority. Retrieved from, <https://www.biocycle.net/california-composting/>.
- Coleman-Jensen A.R.M., C.A. Gregory, and A. Singh. 2017. Household Food Security in the United States in 2016. United States Department of Agriculture Economic Research Service Err-237.
- Collins, A., D. Joseph, and K. Bielaczyc. 2004. Design research: Theoretical and methodological issues. *Journal of Learning Sciences* 13:15-42.
- Deaconu, A., Ekomer., and S. Sherwood. 2021. Promoting traditional foods for human and environmental health: lessons from agroecology and Indigenous communities in Ecuador. *BMC Nutr* 7.
- EPA. 2021. Excess Food Map. <https://geopub.epa.gov/ExcessFoodMap/>.
- EPA. July 2020. Wasted food measurement methodology scoping memo. Retrieved from, https://www.epa.gov/sites/production/files/2020-06/documents/food_measurement_methodology_scoping_memo-6-18-20.pdf.

- EPA. October 2020. Reducing wasted food at home. Retrieved from, <https://www.epa.gov/recycle/reducing-wasted-food-home>.
- EPA. Reducing the impact of wasted food by feeding the soil and composting. Retrieved from, <https://www.epa.gov/sustainable-management-food/reducing-impact-wasted-food-feeding-soil-and-composting>.
- Fanshel, R. and I. Iles. 2020. Transforming the campus foodscape through participatory mapping. *Case Studies in the Environment. Sustainability*:1-16.
- Fanshel, R.Z., A. Iles, and M. Prier. 2018. Building Equitable and Inclusive Food Systems at UC Berkeley: the Foodscape Mapping Project Report. Berkeley Food Institute.
- FoodPrint. Food justice. GRACE Communications Foundation. Retrieved from, <https://foodprint.org/issues/food-justice/>.
- Hanna, P. February 11, 2019. What is Food Apartheid? <https://blogs.rochester.edu/thegreendandelion/2019/02/what-is-food-apartheid/>.
- Hawken, P. 2017. Food. Composting Pages 62-64 in P. Hawken, editor. *Drawdown: The most comprehensive plan ever proposed to reverse global warming*. Penguin Books, New York, New York, USA. Retrieved from, <https://www.drawdown.org/solutions/composting>.
- ILSR. What is Community Composting? Institute for Local Self-Reliance. Retrieved from, <https://ilsr.org/composting/what-is-community-composting/>.
- Jean-Baptiste, B., and G. Giulia. 2019. Towards a metabolic rift analysis: the case of urban agriculture and organic waste management in Rennes (France). *Geoforum* 98:97-107.
- Lunag Jr., M.N., J.C. Elauria, and J.D. Burguillos. 2020. Community-based bin design approach: an initial stage urban composting at a hill station, Philippines. *Environment, Development and Sustainability*.
- McClintock, N., and Cooper, J. (2010). *Cultivating the Commons: An Assessment of the Potential for Urban Agriculture on Oakland's Public Land*. Available at www.urbanfood.org. Working paper.
- McClintock, Nathan. 2010. Why Farm the City? Theorizing Urban Agriculture through a Lens of Metabolic Rift. *Urban Studies and Planning Faculty Publications and Presentations* 91. Retrieved from, <http://archives.pdx.edu/ds/psu/12627>.
- Moreno, L., T. Tran, and M.D. Potts. 2020. Consider a broccoli stalk: How the concept of edibility influences quantification of household food waste. *Journal of Environmental Management* 256:1-9.

- Muwekma Ohlone Tribe of the San Francisco Bay Area. 2021. Home Page.
<http://www.muwekma.org/home.html>
- Nash, M.A. 2019. Entangled pasts: Land-grant colleges and American Indian dispossession. *History of Education Quarterly* 59:437-467.
- Odoms-Young, A.M. and M.A. Bruce. 2018. Examining the impact of structural racism on food insecurity. *Family & Community Health* 41: S3–S6.
- O'Donnell, T. 2014. Household Food Waste Pilot Project. The Last Food Mile Conference.
<https://repository.upenn.edu/thelastfoodmile/sessions/session/23>.
- O'Neill, K. 2019. Linking wastes and climate change: Bandwagoning, contention, and global governance. *WIREs Climate Change* 10: e568.
- Platt, B., J. McSweeney, and J. Davis. 2014. Growing local fertility: A guide to community composting. Institute for Local Self-Reliance and Highfields Center for Composting. Retrieved from, <https://ilsr.org/wp-content/uploads/2014/07/growing-local-fertility.pdf>.
- Platt, B. April 4, 2017. Hierarchy to Reduce Food Waste & Grow Community. The Institute for Local Self-Reliance. Retrieved from, <https://ilsr.org/food-waste-hierarchy/>.
- Porpino, G., J. Parente, and B. Wansink. 2015. Food waste paradox: antecedents of food disposal in low income households. *International Journal of Consumer Studies* 39:619-629.
- Ricker, H. December 4, 2019. Small batch composters are digging deep to find big waste solutions. Oakland North. Retrieved from, <https://oaklandnorth.net/2019/12/04/small-batch-composters-are-digging-deep-to-find-big-waste-solutions/>.
- Scott, E.E., M.P. Wenderoth, and J.H. Doherty. 2020. Design-Based Research: A Methodology to Extend and Enrich Biology Education Research. *CBE—Life Sciences Education* 19:1-12.
- Siegner, A.B., J. Sowerwine, and C. Acey. 2018. Does Urban Agriculture Improve Food Security? Examining the Nexus of Food Access and Distribution of Urban Produced Foods in the United States: A Systematic Review. *Sustainability* 10:2988.
- Siegner, A.B., C. Acey, and J. Sowerwine. 2020. Producing urban agroecology in the East Bay: from soil health to community empowerment. *Agroecology and Sustainable Food Systems* 44:566-593.
- U.S. Food and Drug Administration. 2020. Food Loss and Waste. Retrieved from, <https://www.fda.gov/food/consumers/food-loss-and-waste>.
- Williams, J.M. 2017. Building community capacity for food and agricultural justice: Lesson from the Cuban Permaculture Movement in I. Werkheiser and Z. Piso, editors. *Food Justice in US and Global Contexts: Bringing Theory and Practice Together*. The International Library of Environmental, Agricultural and Food Ethics 24:31-50.

Woehling, A. N.d. Womanly chats with Karen Washington. Womanly Magazine. Issue 6: Food, Nutrition, and Access in our Communities. Retrieved from, <https://www.womanlymag.com/issue-no-6/womanly-chats-with-karen-washington>.

World Food Policy Center. N.d. Corporate Power, Food Apartheid, and the New Jim Crow (1975-2000). Duke Sanford: World Policy Center. Retrieved from, <https://wfpc.sanford.duke.edu/durham-food-history/corporate-power-food-apartheid-and-new-jim-crow-1975-2000>.

Slater, R., and M. Aiken. 2015. Can't you count? Public service delivery and standardized measurement challenges - the case of community composting. *Public Management Review* 17:1085–1102.

StopWaste. n.d. WM EarthCare. Retrieved from, <https://www.stopwaste.org/resource/wm-earthcare>.

APPENDIX A: BSF Composting Survey Qualitative Organization

Respondent Entry Number	Q1. What garden spaces do you work in or feel connected with. Respondents could select all the gardens that pertained to them.	Q4. What BSF projects are you currently involved in? You can be as general or as specific as you want. (i.e., part of the #cookbook, #compost, #operations Slack channels/BSF teams if you want to be general, or you can have a longer answer describing the specific tasks and projects you have done since being a part of BSF!)	Q14. Would you want to start or continue to participate in a program to bring your food scraps to a campus garden for composting? Why or why not.	Q16. Is there anything specific you envision for how the Community Composting at BSF project can be run?
1	Fannie Lou Hamer Oxford Tract SOGA Spring 2021 DeCal	#compost, #facilitators, #art, #history #meeting-planning	Yes- I love the feeling of limiting my waste by returning it to the soil.	Specific pickup/drop-off sites for food scraps
2	Oxford Tract SOGA	Compost and fungi specifically. Some general on-site maintenance and observation.		
3	Indigenous & Native Coalition Fannie Lou Hamer Gill Tract La Loma Rooftop Oxford Tract SOGA	I'm involved in strategic planning, operations, grant writing, meeting planning, food distribution, collaborations with campus partners, research, and more!	I would love to. I also have a home compost system that is super convenient.	I would love to see more campus food wastes diverted to a Community Compost project!
4	SOGA	Garden management, grant writing, meeting planning		Compost can be expensive so I'd love to see like open hours when people can come and harvest compost for their home garden!
5	Oxford Tract SOGA	Compost and Fungi mainly. Some general work at Soga.	Kinda, mostly what prevents me is my housemates cook a lot of meat and throw meat and dairy in our general compost. Also I'm lazy.	

Respondent Entry Number	Q1. What garden spaces do you work in or feel connected with. Respondents could select all the gardens that pertained to them.	Q4. What BSF projects are you currently involved in? You can be as general or as specific as you want. (i.e., part of the #cookbook, #compost, #operations Slack channels/BSF teams if you want to be general, or you can have a longer answer describing the specific tasks and projects you have done since being a part of BSF!)	Q14. Would you want to start or continue to participate in a program to bring your food scraps to a campus garden for composting? Why or why not.	Q16. Is there anything specific you envision for how the Community Composting at BSF project can be run?
6	Clark Kerr Garden Oxford Tract SOGA	#cookbook facilitator, #workshop member, #csa, #meetingplanning, #grantwriting for TGIF grant	Yes - it would be amazing to be able to see the closed circle of farming, harvesting, consuming, and then returning those nutrients to the ground they came from.	
7	Clark Kerr Garden Oxford Tract SOGA	#cookbook #operations #meetingplanning	Yes I would continue because it is a simple process that is important.	
8	Fannie Lou Hamer Oxford Tract SOGA	#compost, #workshops, #operations, #antioppression	yes, it's special to have our community feed our soil which feeds our plants which feed us. tangible transformative results vs sending waste off to a mystery site owned by the city	
9	Oxford Tract SOGA	Newsletter, cookbook, workshop	Yes because before bringing my compost to BSF, I was throwing away lots of food scraps and if everyone in the community had access to more places that allow compost, then a lot of food wouldn't go to waste.	For it to be very accessible (walking distance, bus ride away)
10	SOGA	#cookbook #comms	Yes bc I don't have compost in my building.	

Respondent Entry Number	Q1. What garden spaces do you work in or feel connected with. Respondents could select all the gardens that pertained to them.	Q4. What BSF projects are you currently involved in? You can be as general or as specific as you want. (i.e., part of the #cookbook, #compost, #operations Slack channels/BSF teams if you want to be general, or you can have a longer answer describing the specific tasks and projects you have done since being a part of BSF!)	Q14. Would you want to start or continue to participate in a program to bring your food scraps to a campus garden for composting? Why or why not.	Q16. Is there anything specific you envision for how the Community Composting at BSF project can be run?
11	Oxford Tract SOGA	#compost #comms #art #cooking #facilitator		
12	SOGA	the decal, weekly meetings, open hours on Sunday	yes!	
13	Oxford Tract SOGA	Compost	yes	love community composting!
14	SOGA	#seedlibrary, #decal, #compost	Yes! It is a great way to use up food scraps that would otherwise be thrown in the garbage.	Ask the community for their scraps/make it more widely known. I have told a lot of people about bringing in compost and they didn't know it was available at Berkeley. I can help make flyers/graphics if wanted as well hehe. I will also continue to spread the word :)
15	Oxford Tract SOGA	grant writing, cookbook, compost, meeting planning	Yes, it feels less wasteful and makes me think more about what food I am throwing away and why; more awareness of my own food consumption and contributing to the operations of the garden spaces	it would be incredible if we could partner with larger living spaces like co-ops to collect their food scraps

Respondent Entry Number	Q1. What garden spaces do you work in or feel connected with. Respondents could select all the gardens that pertained to them.	Q4. What BSF projects are you currently involved in? You can be as general or as specific as you want. (i.e., part of the #cookbook, #compost, #operations Slack channels/BSF teams if you want to be general, or you can have a longer answer describing the specific tasks and projects you have done since being a part of BSF!)	Q14. Would you want to start or continue to participate in a program to bring your food scraps to a campus garden for composting? Why or why not.	Q16. Is there anything specific you envision for how the Community Composting at BSF project can be run?
16	Clark Kerr Garden Brown's Cafe Herbal Garden Spring 2021 DeCal		Possibly, but it's pretty easy and convenient to just put my food scraps in my compost bin at home and I know it's going to a good facility where it will be effectively processed and ultimately used.	
17	Clark Kerr Garden Brown's Cafe Herbal Garden Spring 2021 DeCal			

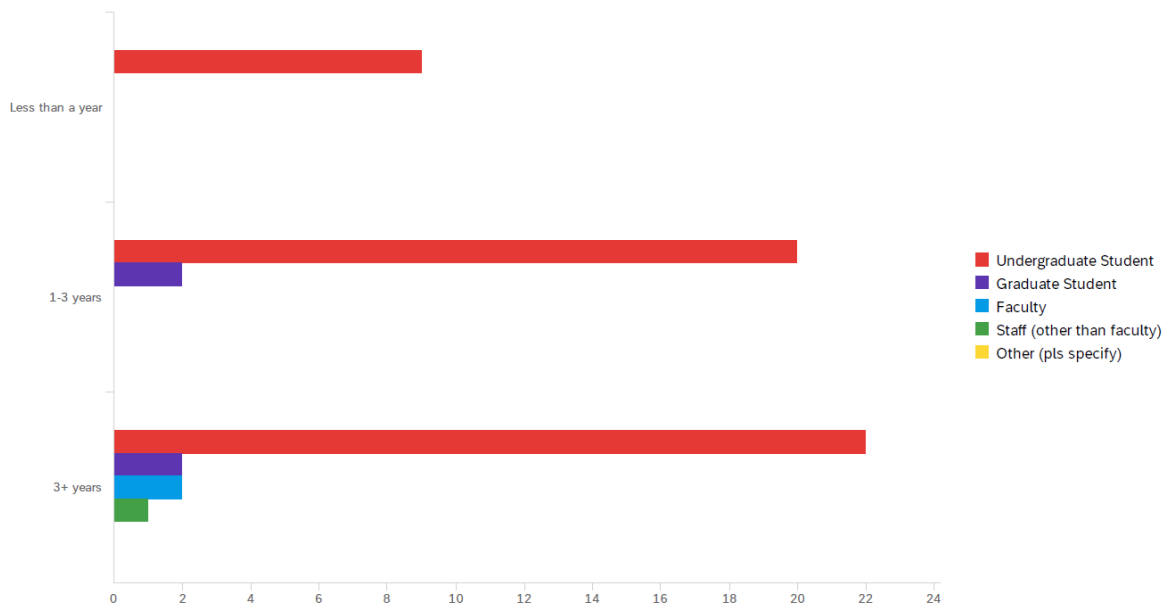
APPENDIX B: Pilot Study Questionnaire

Default Report

Community Composting @ Berkeley

January 2, 2021 9:12 PM MST

Q1 - What is your campus affiliation and for how long have you been affiliated with UC-Berkeley?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Undergraduate Student	1.00	3.00	2.25	0.74	0.54	51
4	Staff (other than faculty)	3.00	3.00	3.00	0.00	0.00	1
5	Other (pls specify)	0.00	0.00	0.00	0.00	0.00	0
2	Graduate Student	2.00	3.00	2.50	0.50	0.25	4
3	Faculty	3.00	3.00	3.00	0.00	0.00	2

Default Report

Community Composting @ Berkeley

January 2, 2021 9:12 PM MST

CTD

Q1 - What is your campus affiliation and for how long have you been affiliated with UC-

Berkeley?

#	Field	Less than a year	1-3 years	3+ years	Total
1	Undergraduate Student	17.65% 9	39.22% 20	43.14% 22	51
2	Graduate Student	0.00% 0	50.00% 2	50.00% 2	4

#	Field	Less than a year Total	1-3 years	3+ years	Total
3	Faculty	0.00% 0	0.00% 0	100.00% 2	2
4	Staff (other than faculty)	0.00% 0	0.00% 0	100.00% 1	1
5	Other (pls specify)	0.00% 0	0.00% 0	0.00% 0	0

Showing rows 1 - 5 of 5

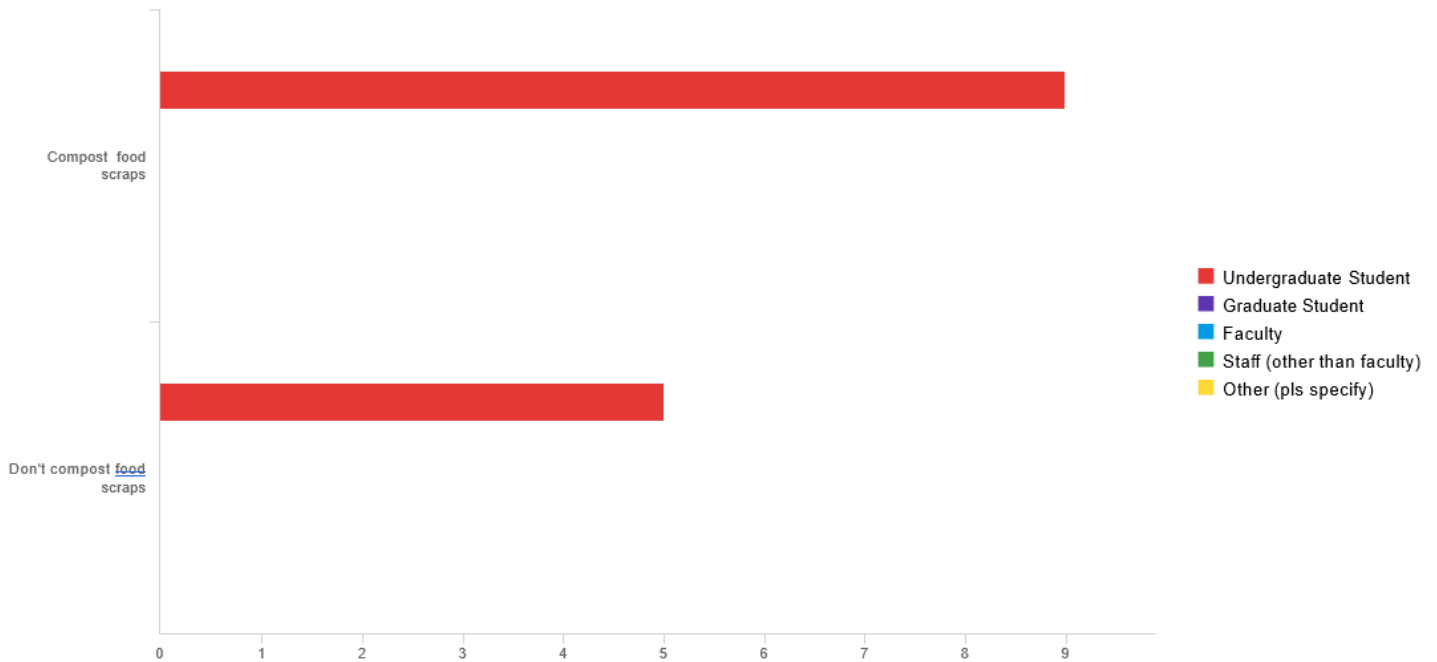
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Community Composting @ Berkeley

January 2, 2021 9:12 PM MST

Q2 #43 - Do you live on or off campus and do you take part in composting food scraps?

On-Campus Housing



#	Field	Compost food scraps	Don't compost food scraps	Total
1	Undergraduate Student	64.29% 9	35.71% 5	14
2	Graduate Student	0.00% 0	0.00% 0	0

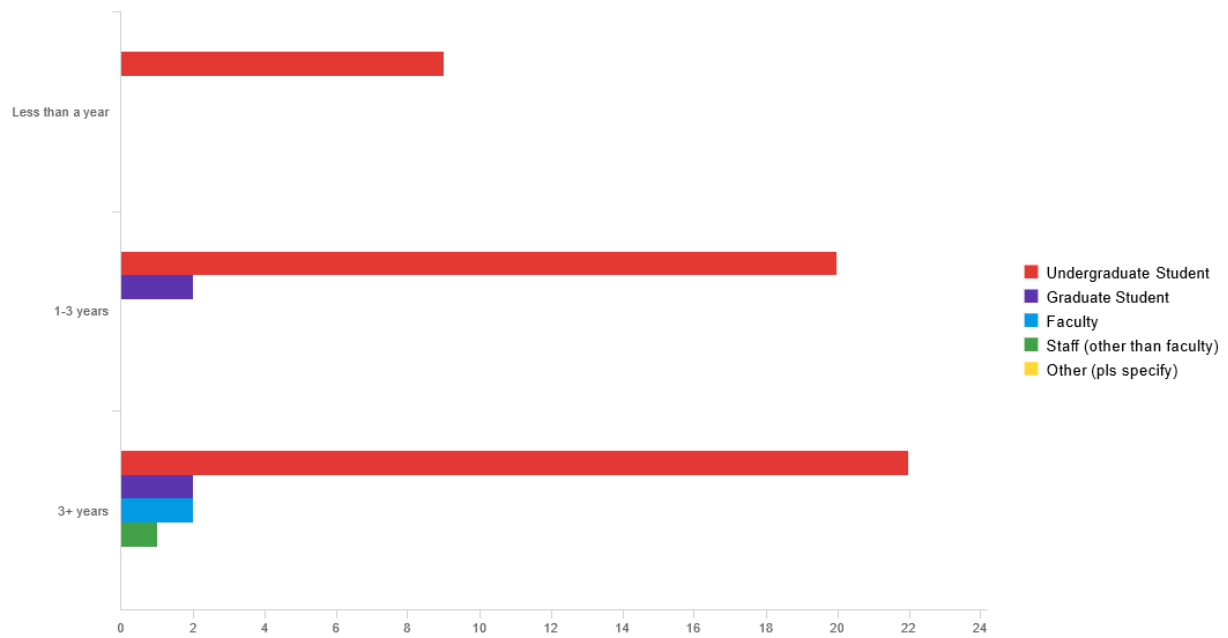
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Community Composting @ Berkeley

January 2, 2021 9:12 PM MST

Q2 #2 - Do you live on or off campus and do you take part in composting food scraps?

Off-Campus Housing



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Undergraduate Student	1.00	2.00	1.37	0.48	0.23	41
2	Graduate Student	1.00	1.00	1.00	0.00	0.00	4
3	Faculty	1.00	1.00	1.00	0.00	0.00	2
4	Staff (other than faculty)	0.00	0.00	0.00	0.00	0.00	0
5	Other (pls specify)	0.00	0.00	0.00	0.00	0.00	0

#	Field	Compost food scraps		Don't compost food scraps		
1	Undergraduate Student	63.41%	26	36.59%	15	41
2	Graduate Student	100.00%	4	0.00%	0	4
3	Faculty	100.00%	2	0.00%	0	2
4	Staff (other than faculty)	0.00%	0	0.00%	0	0
5	Other (pls specify)	0.00%	0	0.00%	0	0
		Total				

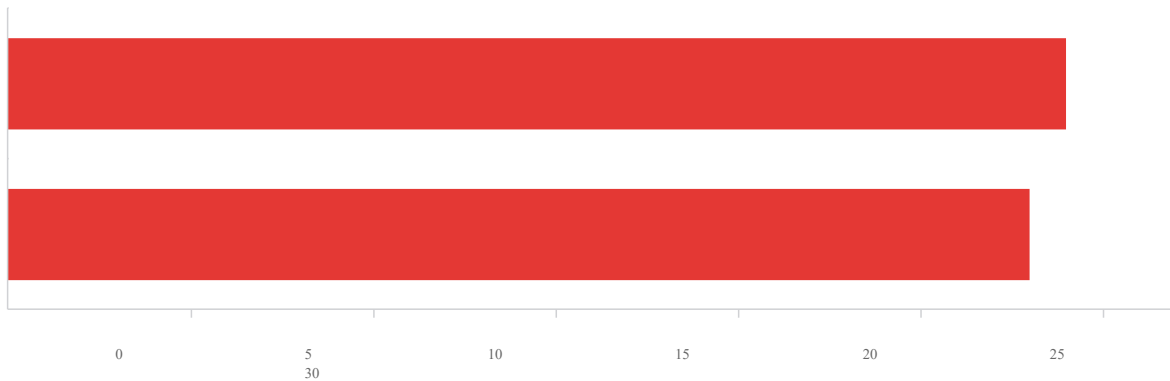
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Default Report

Community Composting @ Berkeley

January 2, 2021 9:12 PM MST

Q4 - True or False. You engaged in the practice of composting food scraps before being affiliated with the university.



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	True or False. You engaged in the practice of composting food scraps before being affiliated with the university.	1.00	2.00	1.49	0.50	0.25	57

#	Field	Choice Count
1	True	50.88% 29
2	False	49.12% 28

57

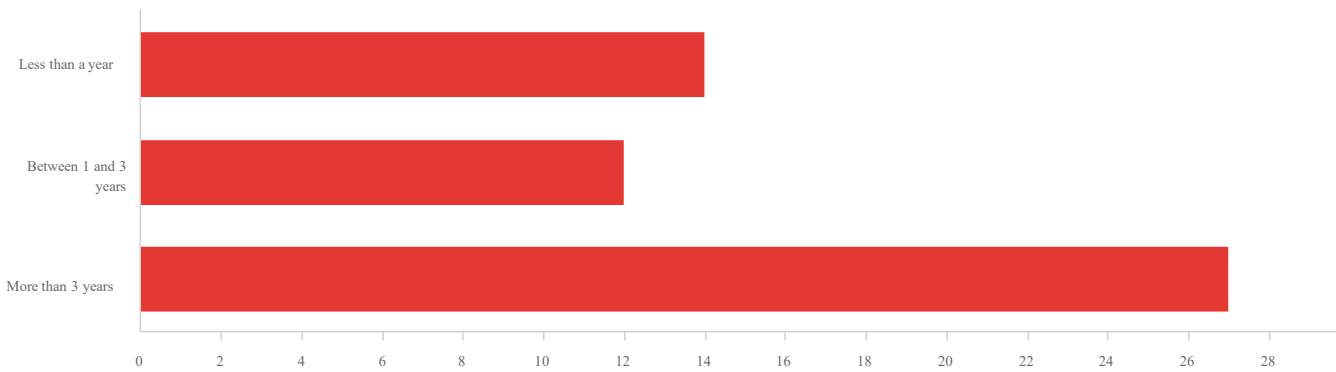
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Default Report

Community Composting @ Berkeley

January 2, 2021 9:12 PM MST

Q5 - For how long have you been composting your food scraps for?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	For how long have you been composting your food scraps for?	1.00	3.00	2.25	0.84	0.71	53

#	Field	Choice Count
1	Less than a year	26.42% 14
2	Between 1 and 3 years	22.64% 12
3	More than 3 years	50.94% 27
		53

Showing rows 1 - 4 of 4

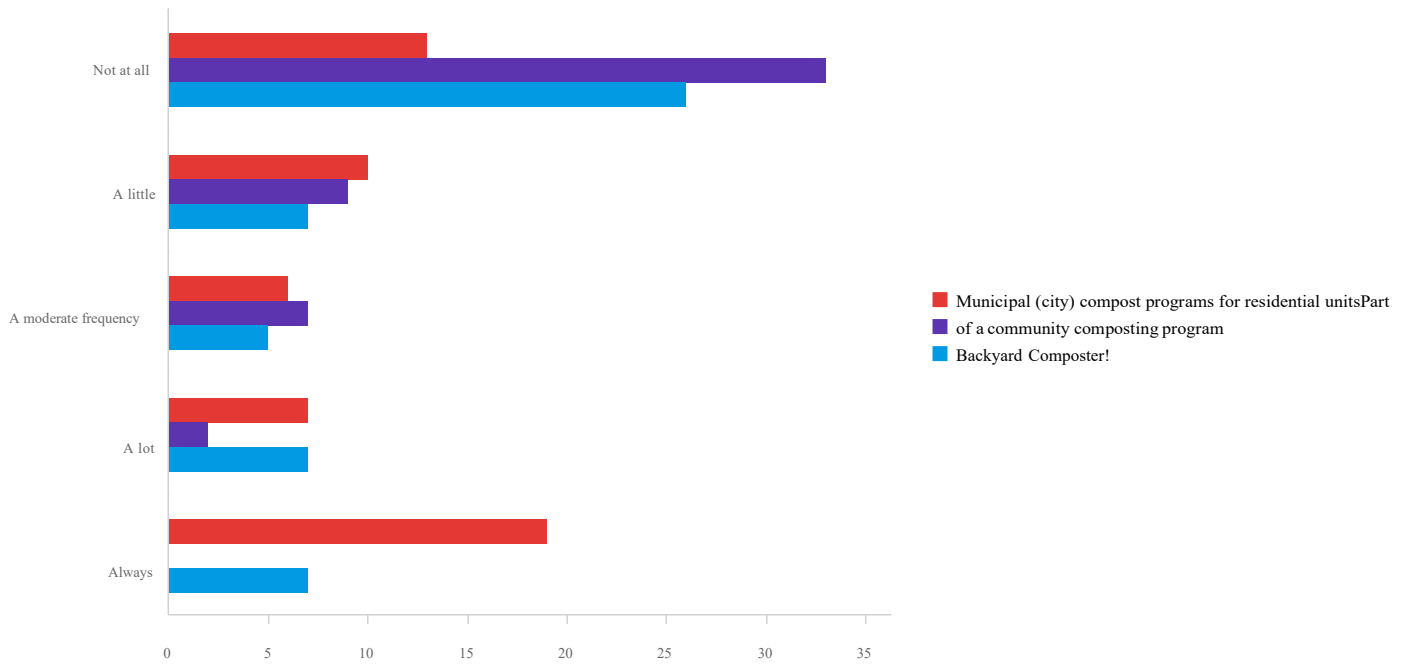
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Community Composting @ Berkeley

January 2, 2021 9:12 PM MST

Q6 - What type of composting practices are you engaged with and what is the frequency of that engagement?

(You can be part of multiple programs!)



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Municipal (city) compost programs for residential units	1.00	5.00	3.16	1.62	2.61	55
2	Part of a community composting program	1.00	4.00	1.57	0.87	0.76	51
3	Backyard Composter!	1.00	5.00	2.27	1.51	2.27	52

Default Report

Community Composting @ Berkeley

January 2, 2021 9:12 PM MST

Q6 - What type of composting practices are you engaged with and what is the frequency of that engagement?

(You can be part of multiple programs!)

#	Field	Not at all	A little	A moderate frequency	A lot	Always	Total
1	Municipal (city) compost programs for residential units	23.64% 13	18.18% 10	10.91% 6	12.73% 7	34.55% 19	55
2	Part of a community composting program	64.71% 33	17.65% 9	13.73% 7	3.92% 2	0.00% 0	51
3	Backyard Composter!	50.00% 26	13.46% 7	9.62% 5	13.46% 7	13.46% 7	52

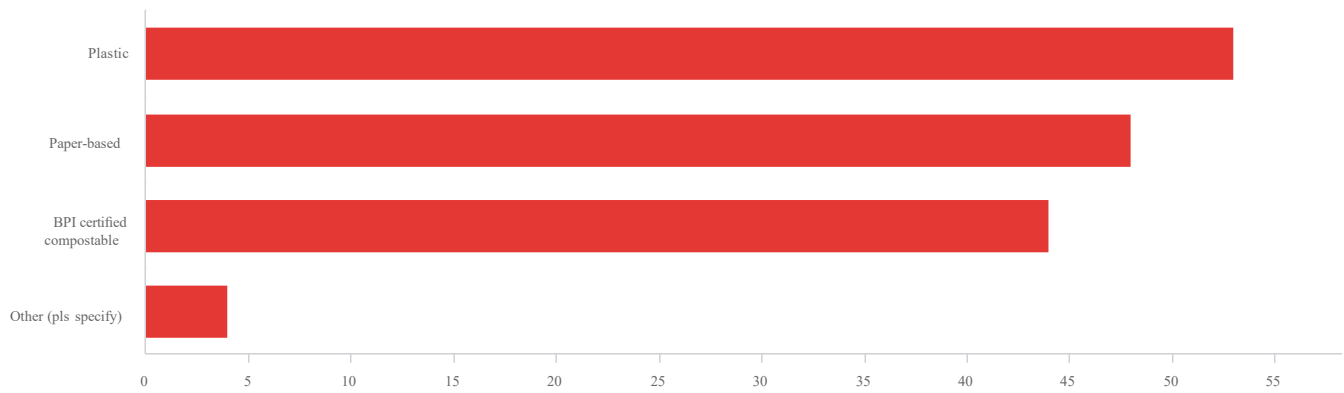
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Default Report

Community Composting @ Berkeley

January 2, 2021 9:12 PM MST

Q7 - What type of packaging do you encounter with your food buying practices? Select all that apply.



#	Field	Choice Count
1	Plastic	35.57% 53
2	Paper-based	32.21% 48
3	BPI certified compostable	29.53% 44
4	Other (pls specify)	2.68% 4

149

Showing rows 1 - 5 of 5

Q7_4_TEXT - Other (pls specify)

Other (pls specify)

Glass

metal, glass

Glass

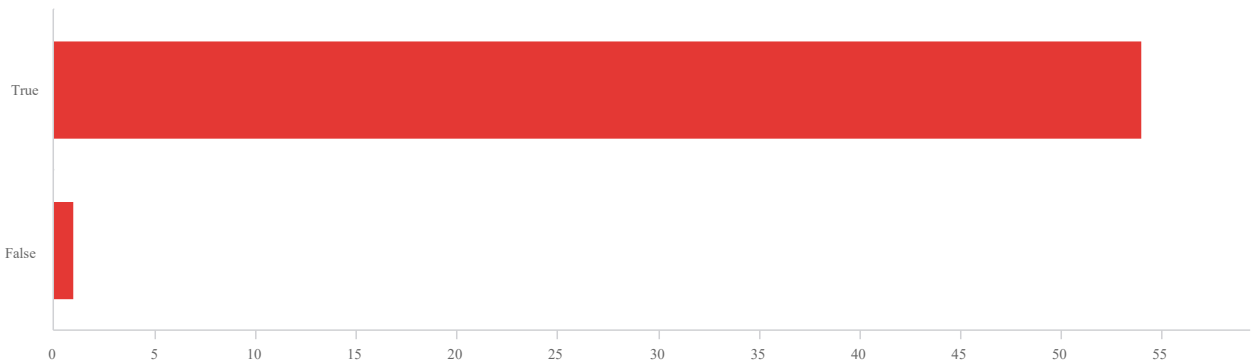
waxy (e.g., frozen dinners), glasses (e.g., dressings)

Default Report

Community Composting @ Berkeley

January 2, 2021 9:12 PM MST

Q8 - True or False. You have brought your own reusable bags to the grocery store for help in packaging your groceries.



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	True or False. You have brought your own reusable bags to the grocery store for help in packaging your groceries.	1.00	2.00	1.02	0.13	0.02	55

#	Field	Choice Count
1	True	98.18% 54
2	False	1.82% 1

55

Showing rows 1 - 3 of 3

Default Report

Community Composting @ Berkeley

January 2, 2021 9:12 PM MST

Q9 - What is the frequency that you bring your own materials (i.e., canvas bags from home, paper bags, BPI certified produce bags, etc.) to a food marketplace for packing up groceries?

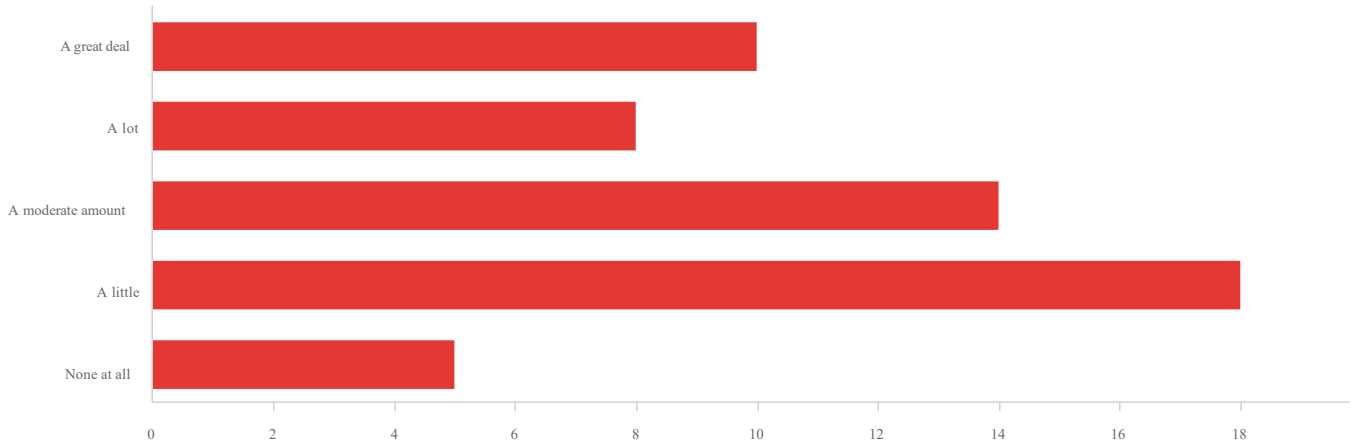
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	For all groceries	10.00	100.00	79.17	24.55	602.47	54
2	For produce	0.00	100.00	58.46	33.81	1143.33	48

Default Report

Community Composting @ Berkeley

January 2, 2021 9:12 PM MST

Q10 - What is the frequency that you use whatever produce bags are provided at the food marketplace to pack up your items?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	What is the frequency that you use whatever produce bags are provided at the food marketplace to pack up your items?	1.00	5.00	3.00	1.25	1.56	55

#	Field	Choice Count
1	A great deal	18.18% 10
2	A lot	14.55% 8
3	A moderate amount	25.45% 14
4	A little	32.73% 18
5	None at all	9.09% 5
		55

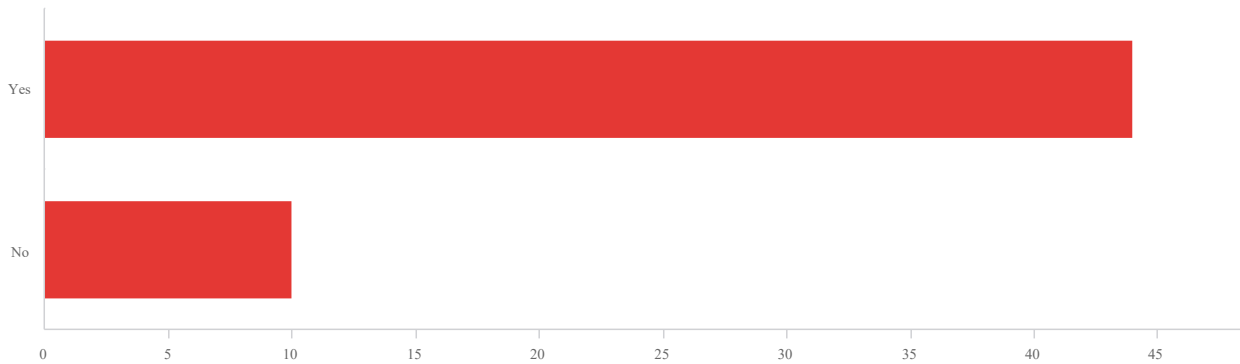
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Community Composting @ Berkeley

January 2, 2021 9:12 PM MST

Q12 - Would you want to participate in a food scrap community composting initiative @ Berkeley? There would be multiple places to drop off your food scraps or could be picked up. The food scraps we collect will be an input for compost we create for use at the Berkeley campus gardens as well as for sharing with the local community!



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Would you want to participate in a food scrap community composting initiative @ Berkeley? There would be multiple places to drop off your food scraps or could be picked up. The food scraps we collect will be an input for compost we create for use at the Berkeley campus gardens as well as for sharing with the local community!	1.00	2.00	1.19	0.39	0.15	54

#	Field	Choice Count
1	Yes	81.48% 44
2	No	18.52% 10

54

Showing rows 1 - 3 of 3

End of Report

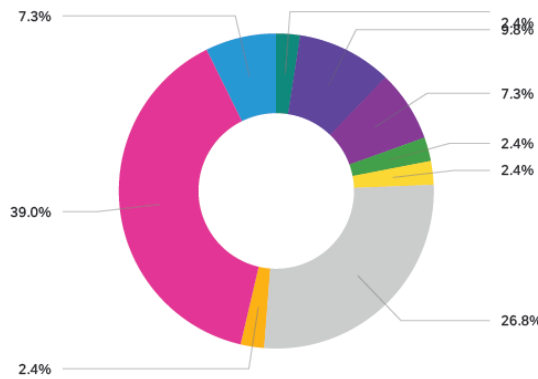
APPENDIX C: BSF Composting Survey

Default Report

BSF Composting survey

May 14, 2021 8:39 PM MDT

Q1 - What garden(s) do you work in/feel connected with? Select all that apply.



- Barker Garden (Indigenous and Native Coalition)
- Clark Kerr Garden (Housing and Dining Sustainability Advocates)
- Fannie Lou Hamer Garden (Black Resource Center)
- Gill Tract Community Farm (UC Berkeley, Black Earth Farms, Sogorea Te Land Trust)
- La Loma Rooftop (Hispanic Engineers and Scientists club)
- Oxford Tract (Department of Plant and Microbial Biology)
- Brown's Cafe Herbal Garden (College of Natural Resources)
- SOGA (Student Organic Gardening Association)
- Agroecology in Action Spring 2021 DeCal

#	Field	Choice Count
9	SOGA (Student Organic Gardening Association)	39.0% 16
7	Oxford Tract (Department of Plant and Microbial Biology)	26.8% 11
6	MCC Healing and Learning Garden (Multicultural Center)	0.0% 0
5	La Loma Rooftop (Hispanic Engineers and Scientists club)	2.4% 1
10	Guerilla Gardening and Agroecology as Resistance	0.0% 0
4	Gill Tract Community Farm (UC Berkeley, Black Earth Farms, Sogorea Te Land Trust)	2.4% 1
3	Fannie Lou Hamer Garden (Black Resource Center)	7.3% 3
2	Clark Kerr Garden (Housing and Dining Sustainability Advocates)	9.8% 4
8	Brown's Cafe Herbal Garden (College of Natural Resources)	2.4% 1
1	Barker Garden (Indigenous and Native Coalition)	2.4% 1
11	Agroecology in Action Spring 2021 DeCal	7.3% 3
		41

Showing rows 1 - 12 of 12

Q2 - About how many hours a week do you garden at a Berkeley Student Farms location

(gardening includes any aspect of physically being on site such as: planting, weeding,

harvesting, seed saving, composting, etc.)?



0-1 hours/wk 1-3 hours/wk 3-5 hours/wk 5+ hours/wk

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	About how many hours a week do you garden at a Berkeley Student Farms location (gardening includes any aspect of physically being on on site such as: planting, weeding, harvesting, seed saving, composting, etc.)?	1.0	4.0	2.8	1.0	1.0	17

#	Field	Choice Count
1	0-1 hours/wk	11.8% 2
2	1-3 hours/wk	23.5% 4
3	3-5 hours/wk	35.3% 6
4	5+ hours/wk	29.4% 5

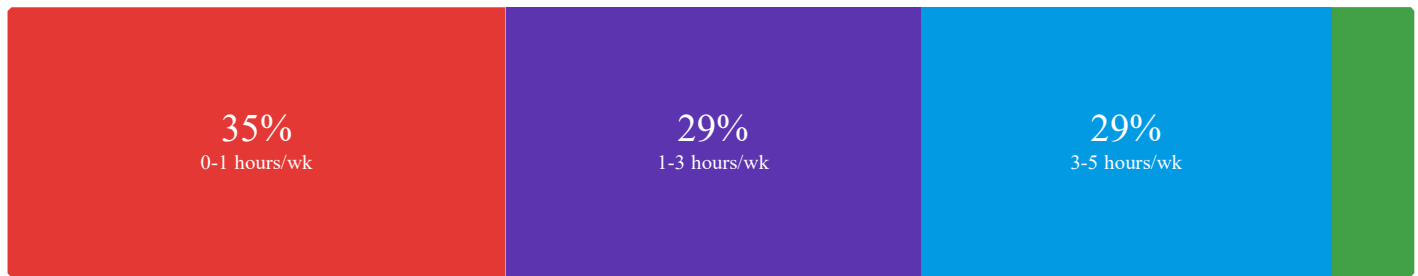
17

Showing rows 1 - 5 of 5

Q3 - About how many hours a week do you participate remotely in BSF? (i.e., attending biweekly BSF

Monday meetings, attending BSF project specific planning meetings,

attending BSF workshops)?



0-1 hours/wk (35%, 6) 1-3 hours/wk (29%, 5) 3-5 hours/wk (29%, 5) 5+ hours/wk (6%, 1)

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	About how many hours a week do you participate remotely in BSF? (i.e. attending biweekly BSF Monday meetings, attending BSF project specific planning meetings, attending BSF workshops)?	1.0	4.0	2.1	0.9	0.9	17

#	Field	Choice Count
1	0-1 hours/wk	35.3% 6
2	1-3 hours/wk	29.4% 5
3	3-5 hours/wk	29.4% 5
4	5+ hours/wk	5.9% 1

17

Showing rows 1 - 5 of 5

Q4 - What BSF projects are you currently involved in? You can be as general or as specific as you want. (i.e., part of the #cookbook, #compost, #operations Slack channels/BSF teams if you want to be general, or you can have a longer answer describing the specific tasks and projects you have done since being a part of BSF!)

What BSF projects are you currently involved in? You can be as general or a...

#compost, #facilitators, #art, #history #meeting-planning

Compost and fungi specifically. Some general on site maintenance and observation.

I'm involved in strategic planning, operations, grant writing, meeting planning, food distribution, collaborations with campus partners, research, and more!

Garden management, grant writing, meeting planning

Compost and Fungi mainly. Some general work at Soga.

#cookbook facilitator, #workshop member, #csa, #meetingplanning, #grantwriting for TGIF grant

#cookbook #operations #meetingplanning

#compost , #workshops , #operations , #antioppression

Newsletter, cookbook, workshop

#cookbook #comms

#compost #comms #art #cooking #facilitator

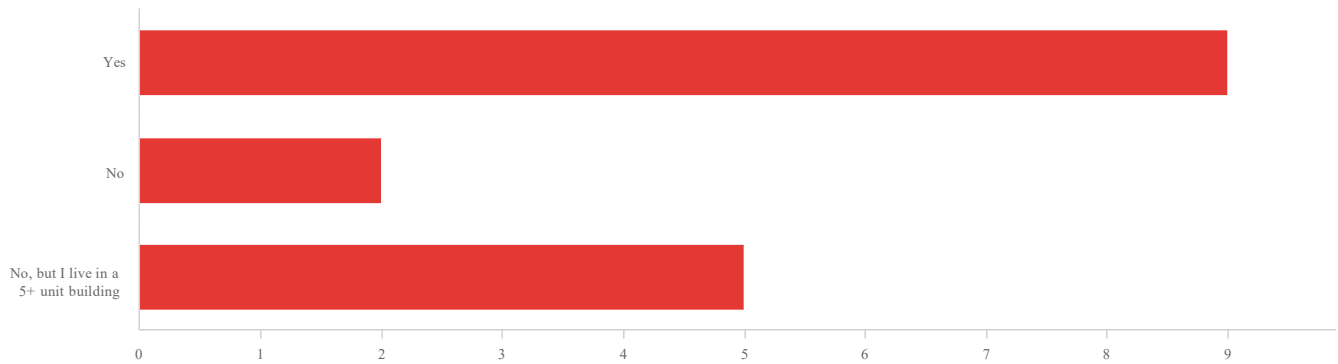
the decal, weekly meetings, open hours on sunday

compost

#seedlibrary, #decal, #compost

grant writing, cookbook, compost, meeting planning

Q5 - Does your residence currently have access to municipal food scrap composting?(5+ units should all have one, but if you do not, choose “No, but I live in a 5+ apartment/multifamily dwelling building”).



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Does your residence currently have access to municipal food scrap composting? (5+ units should all have one, but if you do not, choose “No, but I live in a 5+ apartment/multifamily dwelling building”).	1.0	3.0	1.8	0.9	0.8	16

#	Field	Choice Count
1	Yes	56.3% 9
2	No	12.5% 2
3	No, but I live in a 5+ unit building	31.3% 5
		16

Showing rows 1 - 4 of 4

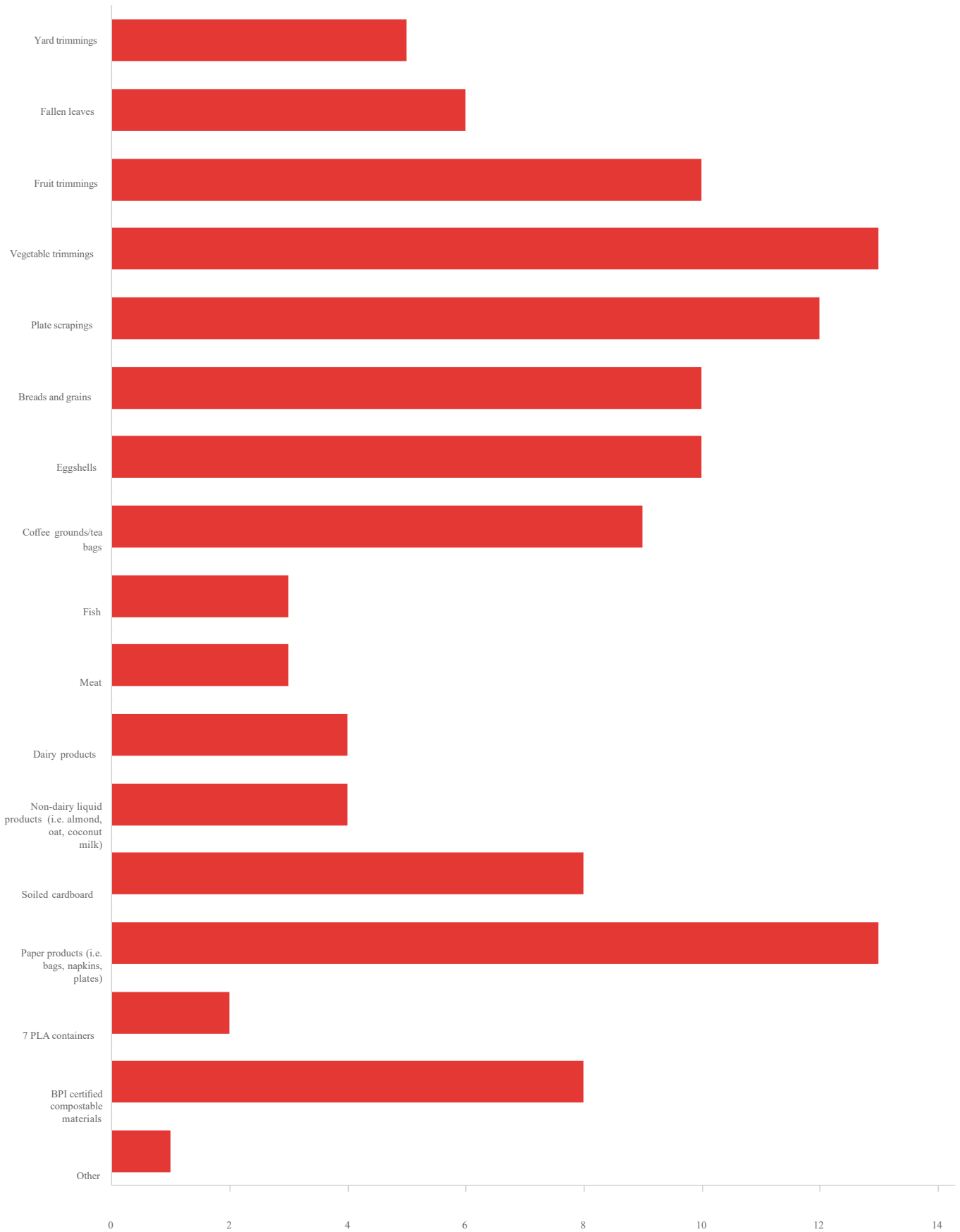
Q6 - What types of organic waste do you personally recycle in the green waste city bin?(If you don't have composting at your residence, you can still answer this question based on what you compost in city and university organics recycling bins). Select all that apply.

Q6_17_TEXT - Other

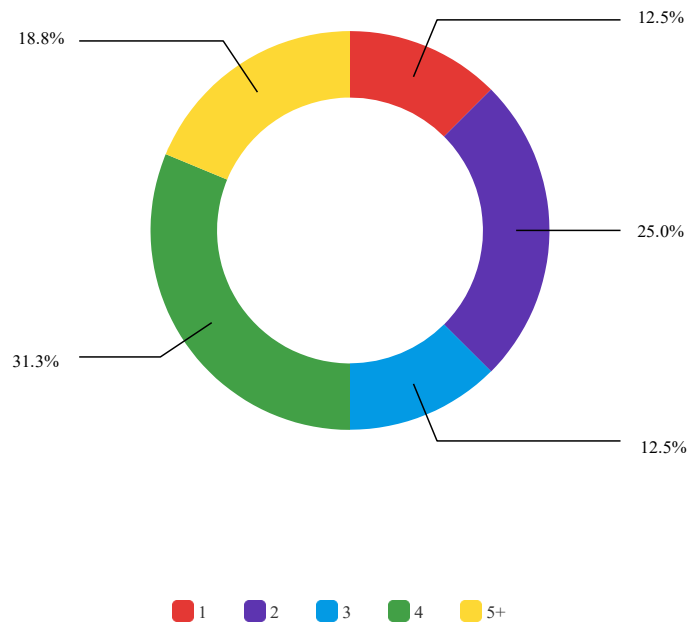
Other

I think all of them but IDK honestly.

#	Field	Choice Count
1	Yard trimmings	4.1% 5
2	Fallen leaves	5.0% 6
3	Fruit trimmings	8.3% 10
4	Vegetable trimmings	10.7% 13
5	Plate scrapings	9.9% 12
6	Breads and grains	8.3% 10
7	Eggshells	8.3% 10
8	Coffee grounds/tea bags	7.4% 9
9	Fish	2.5% 3
10	Meat	2.5% 3
11	Dairy products	3.3% 4
12	Non-dairy liquid products (i.e. almond, oat, coconut milk)	3.3% 4
13	Soiled cardboard	6.6% 8
14	Paper products (i.e. bags, napkins, plates)	10.7% 13
15	7 PLA containers	1.7% 2
16	BPI certified compostable materials	6.6% 8
17	Other	0.8% 1
		121



Q7 - How many people live in your household (unit of residence such as: apartment, coop house, campus dorm room such as a triple, etc.), including you? For example, I live in an apartment with one person besides me so I would put 2.



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
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How many people live in your household (unit of residence such as: apartment, coop house, campus dorm room such as a triple, etc.), including you? For example, I live in an apartment with one person besides me so I would put 2.

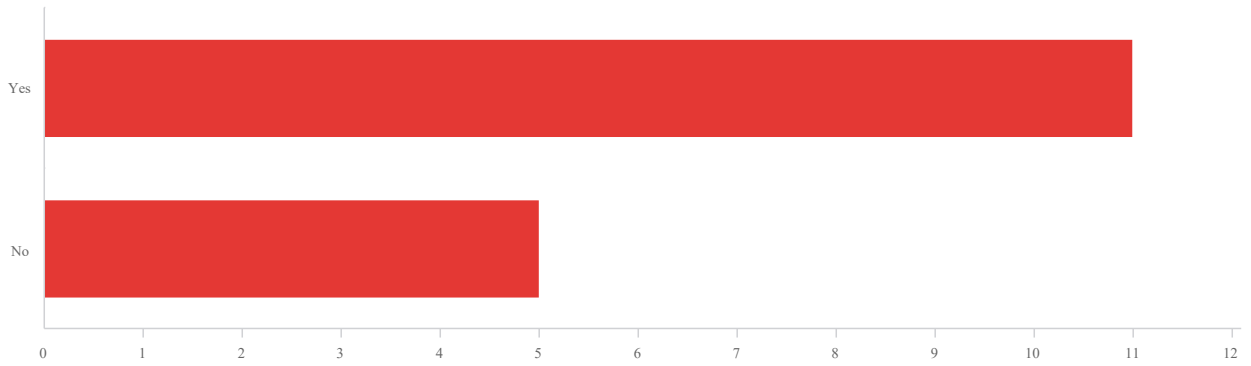
1.0	5.0	3.2	1.3	1.8	16
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#	Field	Choice Count
1	1	12.5% 2

2	2	25.0%	4
3	3	12.5%	2
4	4	31.3%	5
5	5+	18.8%	3
			16

Showing rows 1 - 6 of 6

Q8 - Do you currently bring food scraps to be composted at a Berkeley Student Farms site?



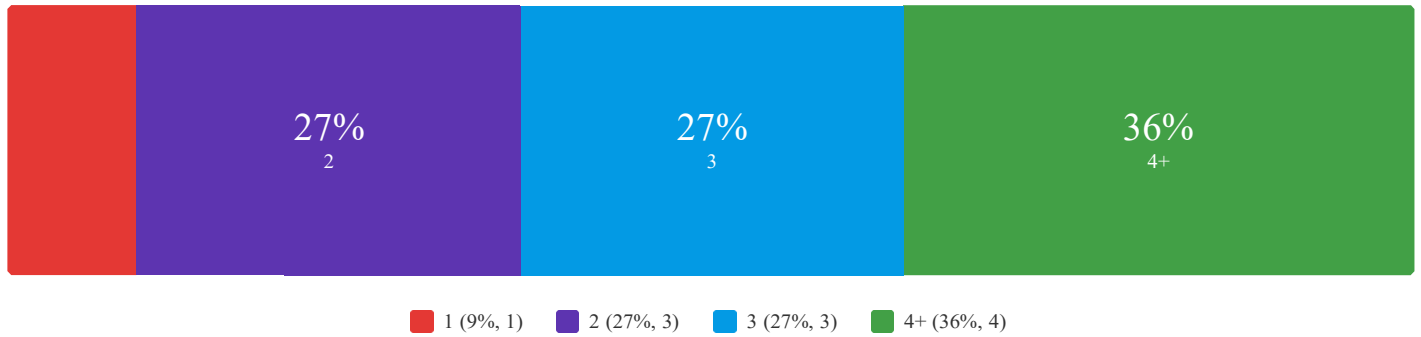
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Do you currently bring food scraps to be composted at a Berkeley Student Farms site?	1.0	2.0	1.3	0.5	0.2	16

#	Field	Choice Count
1	Yes	68.8% 11
2	No	31.3% 5

16

Showing rows 1 - 3 of 3

Q9 - If answered yes, how frequently (how many days) do you estimate you bring food scraps to BSF per month?



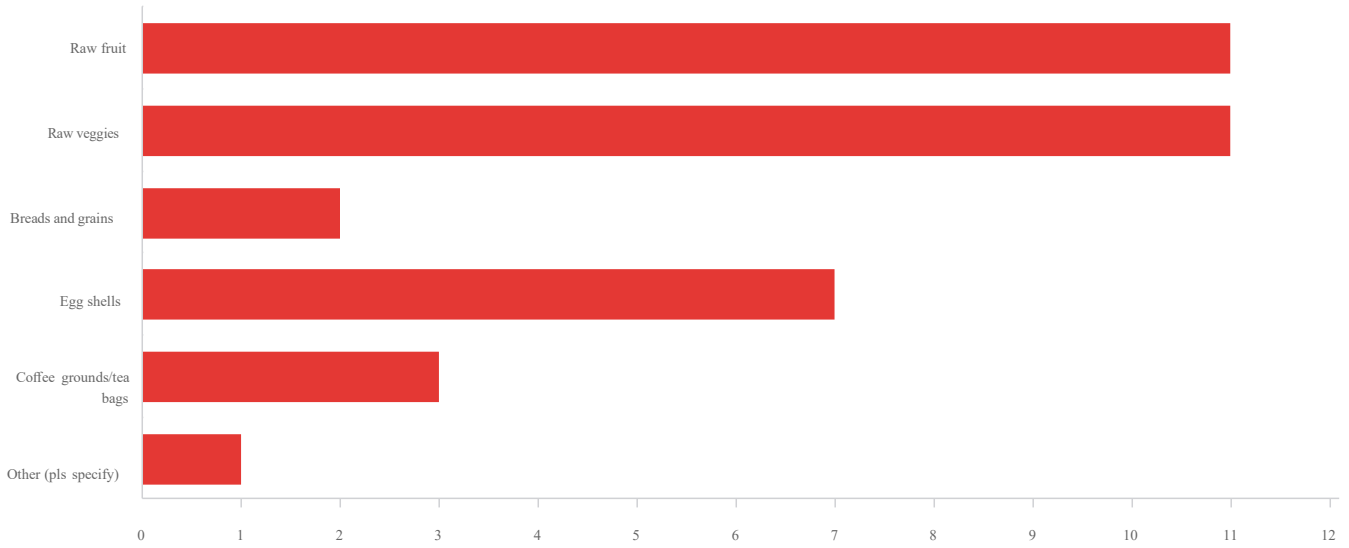
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	If answered yes, how frequently (how many days) do you estimate you bring food scraps to BSF per month?	1.0	4.0	2.9	1.0	1.0	11

#	Field	Choice Count
1	1	9.1% 1
2	2	27.3% 3
3	3	27.3% 3
4	4+	36.4% 4

11

Showing rows 1 - 5 of 5

Q10 - What do you compost at Berkeley Student Farms?



#	Field	Choice Count
1	Raw fruit	31.4% 11
2	Raw veggies	31.4% 11
3	Breads and grains	5.7% 2
4	Egg shells	20.0% 7
5	Coffee grounds/tea bags	8.6% 3
6	Other (pls specify)	2.9% 1

35

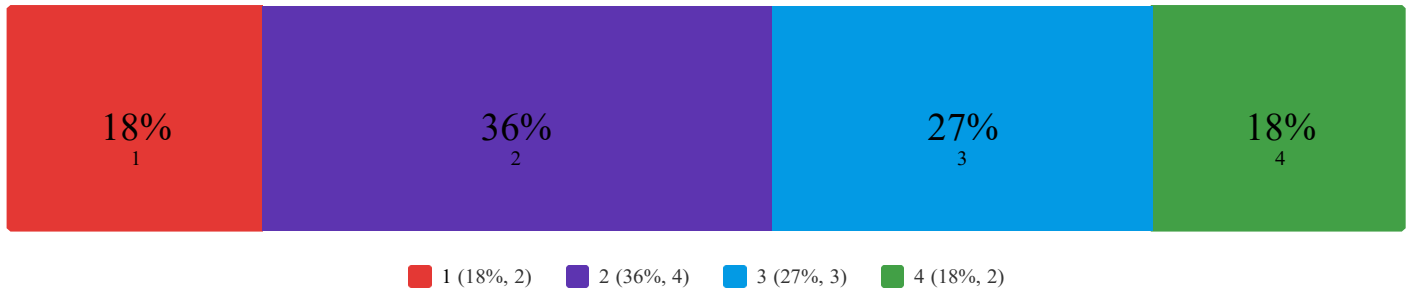
Showing rows 1 - 7 of 7

Q12_6_TEXT - Other (pls specify)

Other (pls specify)

soiled paper products

Q11 - How many people contribute to your BSF food scrap donation, including you?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	How many people contribute to your BSF food scrap donation, including you? - Selected Choice	1.0	4.0	2.5	1.0	1.0	11

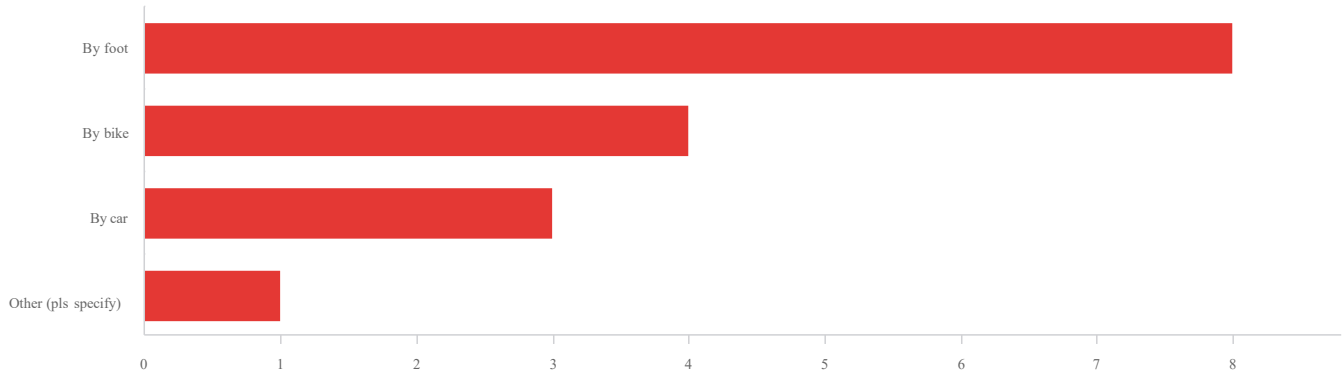
#	Field	Choice Count
1	1	18.2% 2
2	2	36.4% 4
3	3	27.3% 3
4	If more than 3 people, specify how many people here:	18.2% 2
		11

Showing rows 1 - 5 of 5

Q11_4_TEXT - If more than 3 people, specify how many people here:

Field
If more than 3 people, specify how many people here:
4
4

Q12 - How do you transport your food scraps to BSF?



#	Field	Choice Count
1	By foot	50.0% 8
2	By bike	25.0% 4
3	By car	18.8% 3
4	Other (pls specify)	6.3% 1

16

Showing rows 1 - 5 of 5

Q15_4_TEXT - Other (pls specify)

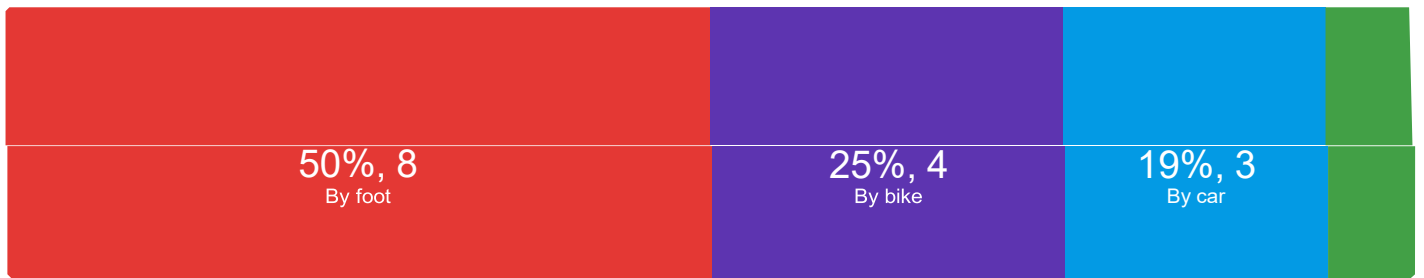
Other (pls specify)

bus

Q15_4_TEXT - Other (pls specify)

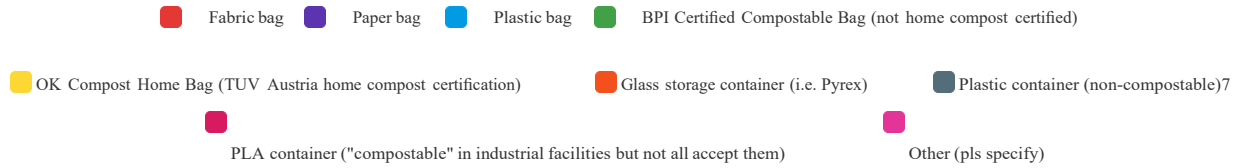
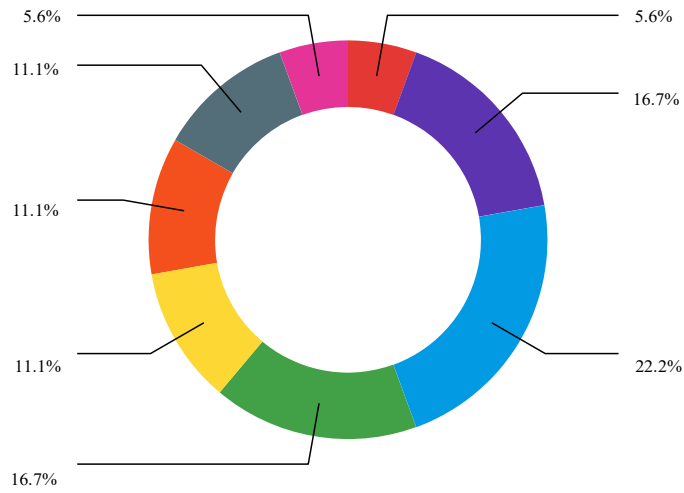
Other (pls specify)

bus



■ By foot (50%, 8) ■ By bike (25%, 4) ■ By car (19%, 3) ■ Other (pls specify) (6%, 1)

Q13 - What material do you use to store and transport your food scraps in? Select all that apply.



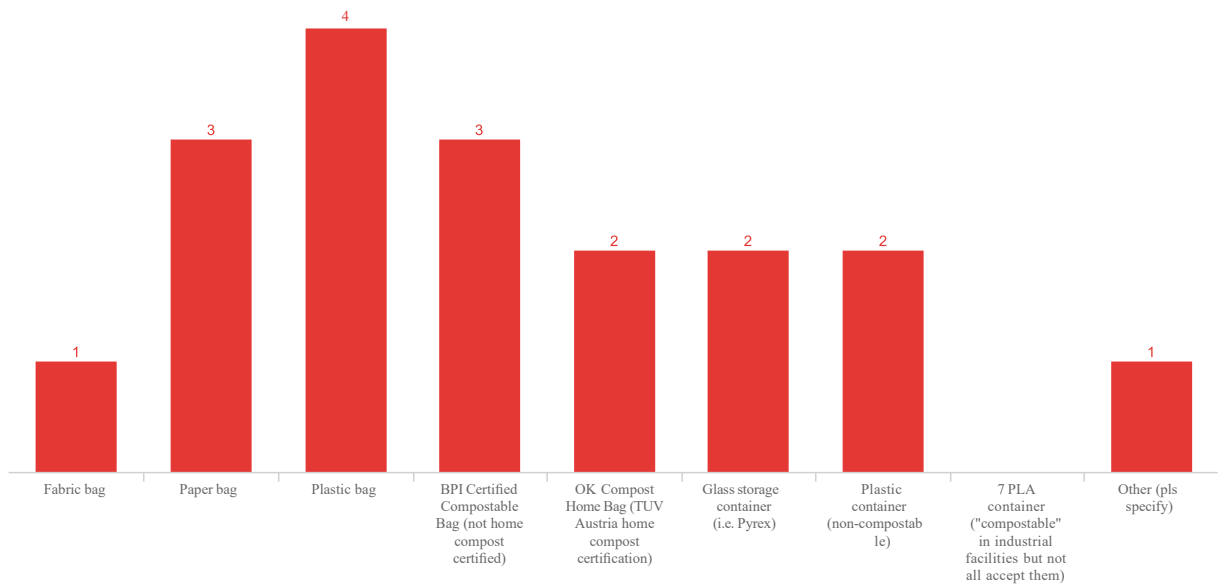
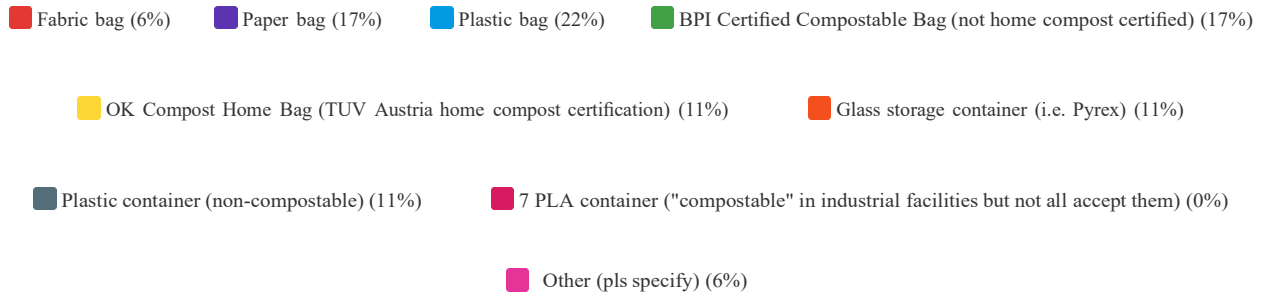
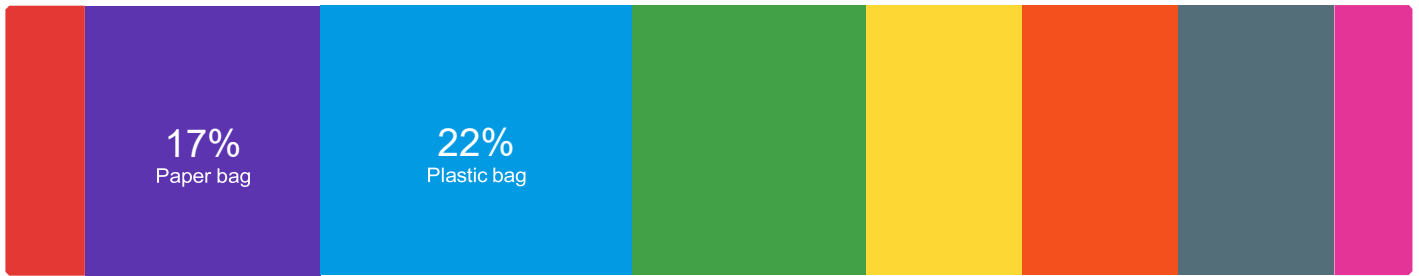
#	Field	Choice Count
1	Fabric bag	5.6% 1
2	Paper bag	16.7% 3
3	Plastic bag	22.2% 4
4	BPI Certified Compostable Bag (not home compost certified)	16.7% 3
5	OK Compost Home Bag (TUV Austria home compost certification)	11.1% 2
6	Glass storage container (i.e. Pyrex)	11.1% 2
7	Plastic container (non-compostable)	11.1% 2
8	7 PLA container ("compostable" in industrial facilities but not all accept them)	0.0% 0
9	Other (pls specify)	5.6% 1
		18

Showing rows 1 - 10 of 10

Q16_9_TEXT - Other (pls specify)

Other (pls specify) ▲

compostable bag.. not sure what kind



Q14 - Would you want to start or continue to participate in a program to bring your foodscraps to a campus garden for composting? Why or why not.

Possibly, but it's pretty easy and convenient to just put my food scraps in my compost bin at home and I know it's going to a good facility where it will be effectively processed and ultimately used.

Yes- I love the feeling of limiting my waste by returning it to the soil.

I would love to. I also have a home compost system that is super convenient.

Kinda, mostly what prevents me is my housemates cook a lot of meat and throw meat and dairy in our general compost. Also I'm lazy.

Yes - it would be amazing to be able to see the closed circle of farming, harvesting, consuming, and then returning those nutrients to the ground they came from.

Yes I would continue because it is a simple process that is important.

yes, it's special to have our community feed our soil which feeds our plants which feed us. tangible transformative results vs sending waste off to a mystery site owned by the city

Yes because before bringing my compost to BSF, I was throwing away lots of food scraps and if everyone in the community had access to more places that allow compost, then a lot of food wouldn't go to waste.

Yes bc I don't have compost in my building.

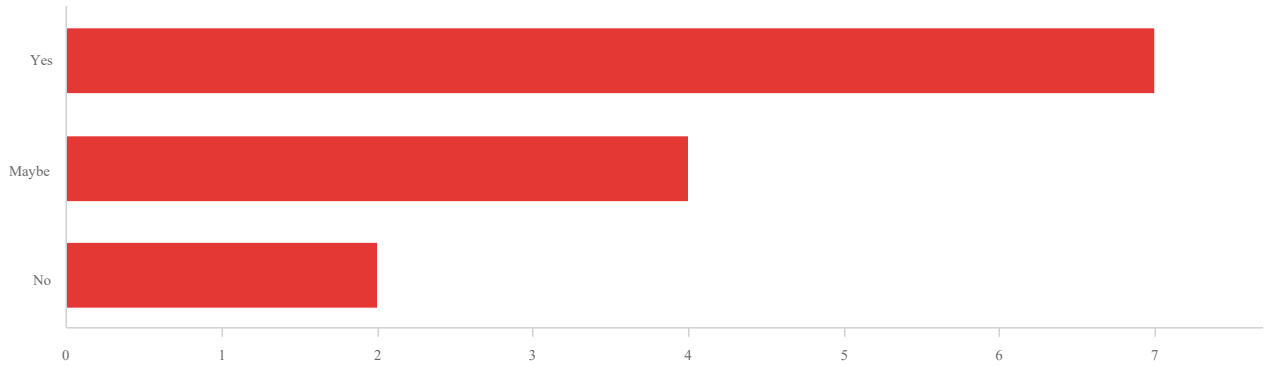
yes!

yes

Yes! It is a great way to use up food scraps that would otherwise be thrown in the garbage.

Yes, it feels less wasteful and makes me think more about what food I am throwing away and why; more awareness of my own food consumption and contributing to the operations of the garden spaces.

Q15 - If answered no or skipped answering above, would a bike powered food scrap home pick-up service change your interest in participating in a BSF-wide community composting project?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	If answered no or skipped answering above, would a bike powered food scrap home pick-up service change your interest in participating in a BSF-wide community composting project?	1.0	3.0	1.6	0.7	0.5	13

#	Field	Choice Count
1	Yes	53.8% 7
2	Maybe	30.8% 4
3	No	15.4% 2
		13

Showing rows 1 - 4 of 4

Q19 - Is there anything specific you envision for how the Community Composting at BSF project can be run?

Specific pickup/dropoff sites for food scraps

I would love to see more campus food wastes diverted to a Community Compost project!

Compost can be expensive so I'd love to see like open hours when people can come and harvest compost for their home garden!

For it to be very accessible (walking distance, bus ride away)

love community composting!

Ask the community for their scraps/make it more widely known. I have told a lot of people about bringing in compost and they didn't know it was available at Berkeley. I can help make flyers/graphics if wanted as well hehe. I will also continue to spread the word :)

it would be incredible if we could partner with larger living spaces like co-ops to collect their food scraps.

Q17 - Anything else about Berkeley Student Farms that you would like to share?

Anything else about Berkeley Student Farms that you would like to share?

Y'all are truly amazing and inspire me. You are doing incredible work!

No :)

End of Report

APPENDIX D: Sample of Data Collection Notes

OT 3 also had all previous piles integrated into it so add those values to find total outside inputs.

OT 1 - no inputs recorded?

OT ½ - only used this abbreviation on 02/21/21

Cumulative_input = **15.3984375**

OT 1+2 - Wed 2/24-SUN 2/28 I used this abbreviation

Cumulative_input = **33.1484375** line 235

OT 1+2 Combined - THU 03/04 - SUN 03/07 I used this abbreviation

Input_Pile = 9.5234375

Cumulative_input = **9.5234375**

OT 2 - only used this abbreviation on 2-21-21

Cumulative_input = **19.2890625**

OT 3 - 03/09/21 (w/ Christine) - 03/21/21 (last recorded inputs)
made a new pile #3 at Oxford Tract and integrated Combined

Cumulative_input = **44.6494862**

OT Sp1 - used this abbreviation between 02-07-21 and 02-16-21

Cumulative_input = **29.882812**

Sum of all OT Cumulative-inputs = **151.8916732 pounds of outside farm inputs**

APPENDIX E: Pictures

February 7, 2021

Oxford Tract (OT)

Coffee Grounds and Wood Chips are some outside farm inputs that we added to our compost pile! The greens in the pile are on-farm green waste material. Coffee Grounds are Nitrogen-rich input material while Wood Chips are Carbon-rich input material.



March 14, 2021

Oxford Tract Cabbage Plants



March 23, 2021
Oxford Tract (OT)
OT Pile 3



April 12, 2021
Oxford Tract (OT)
Harvest from OT Pile 3



April 20, 2021

SOGA Garden; SOGA Sp3



April 20, 2021

Oxford Tract (OT)

Turning OT 4 and Harvesting OT 3



April 24, 2021

Oxford Tract (OT)

Cabbage Plant Progress with some compost amendment



April 24, 2021

SOGA Sp2 (some had already been harvested but the rest is still in the finished compartment)





April 25, 2021
SOGA Panorama

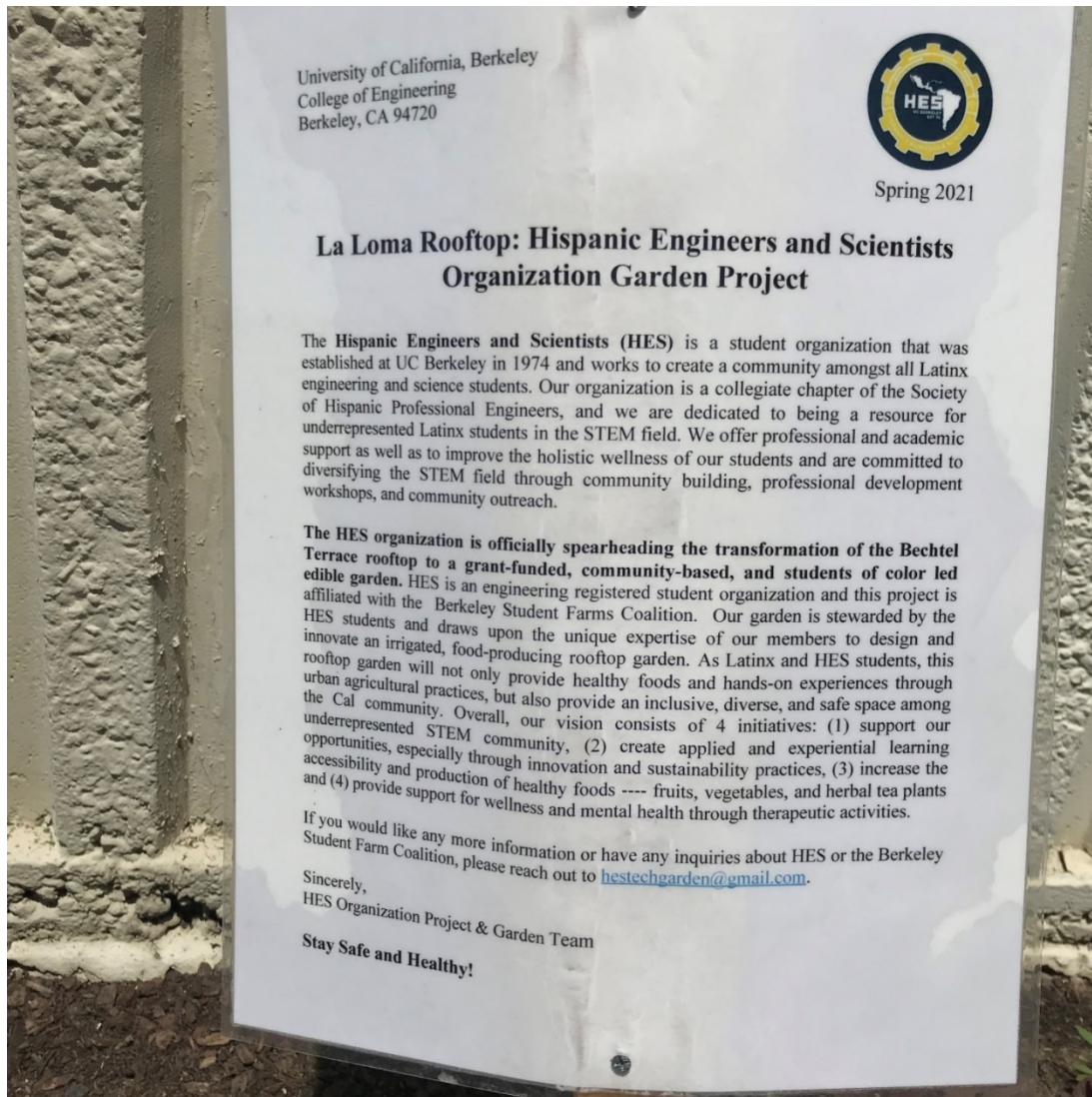


April 27, 2021
ANV
4-flip each; 3-compartment system



April 29, 2021

The Hispanic Engineers and Scientists Organization Garden Project
La Loma Rooftop (Bechtel Terrace Rooftop Garden)





May 6, 2021

Redistributing finished compost from Oxford Tract and sharing it with Fannie Lou Hamer Garden

