

# Progress Report - Campus Sustainability Fund

December 2022 – Feeding the Future

## Email:

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## Project Manager Name:

John Adams and Jason De Leeuw

## Project Name:

Feeding the Future

## Project Subaccount Number:

2234751 - 23.52

## Project Summary Snapshot:

Please copy and paste the "Summary Snapshot" you provided in your project application.

A multi-pronged approach is necessary if we are going to reduce the carbon emissions from agricultural production and its transport, improve the nutritional value of the crops, and increase the accessibility of the food to communities. Container grow environments provide a highly efficient and portable grow space that can be placed almost anywhere. The goal is to create "circular economic" structures, leveraging and integrating this new facility into existing programming to student/community engagement, alternative curriculum, and research & development. Biosphere 2, with its one-of-a-kind mesoscale structure, surpasses traditional laboratories in providing a place that enables this research.

## Requested Metrics:

Please report your project's metrics and their most recent number or response in a list format.

# of crop varieties being planted: 30

# of lbs produced monthly: August 134.16 lbs, September 139.92 lbs, October 240.28 lbs, November 421.96 lbs,

# of pounds donated to the Campus Pantry and local Food Banks: Of the 936.32 lbs of leafy greens grown over 95% of this total has been delivered to the two pantries.

# of students involved in the Capstone project: 6 student

# of student positions created: 3 student

# of people in the core project team involved in planning and execution of the project (if they're a student/ staff/ faculty etc). student -- 9, staff -- 10, faculty -- 5

# of hours spent on this project (broken up by students/ staff) 2 hours per day per student and 1 hour per day staff

## Project Accomplishments :

Please describe what aspects of the project have been accomplished. Be as descriptive and specific as possible. Examples of accomplishments could include: Held 4 public meetings totaling 130 attendees; Transitioned 300 square feet of dirt into usable garden space and signed on 14 community garden volunteers. Other examples of accomplishments could include sharing a confirmed schedule of events, the connections/contacts that have been established, etc.

Currently the number of Crop varieties are 30 (examples included but not limited to lettuces (15 varieties), kale (4 varieties), Bok Choy, Spinach, Arugula, Cilantro, basil, Mustard Greens (4) Crest (2)

Dr Triston Hooks, CEAC Faculty Biosystems Engineering integrated Freight Farm into BE 217, BE 350 Advanced Hydroponic Crop Production, BE 497 Integrated Pest Management for CEA. This fall BE 217: Intro to Hydroponics; 14 students plus Triston visited Freight Farms.

Dr. Gene Giacomelli and his Controlled Environment Systems BE & PLS 483/583 visited with 16 students Biosphere 2 has offered 3 UArizona students, student work positions: Paiton Stith, pstith@arizona.edu, Alex Cantor, alexcantor@arizona.edu, Jordan Collins, jllcollins@arizona.edu Interdisciplinary Engineering Capstone Team Course ENGR 498 A & B was selected Monday August 29th, they have completed the first semester including their PDR and CDR (attached) Brooke Bykowski bykowski@arizona.edu Stephanie Orchard stephanieorchard@arizona.edu Alejandro Quijada aquijada52@arizona.edu Katelynn Carroll katielynn@arizona.edu Logan Eaton loganeaton@arizona.edu Hailey Schleining haileyschleining@arizona.edu Impact Arizona—Initial data provided was on average 175 households totaling 525 people seen per week. Campus Pantry— data provided is that they see approximately 550 people per day. Harvest including delivery takes about 8 hrs for two people, students primarily perform this task now We recorded a video that provides an overview of the Freight Farm for visitors, it will be incorporated into the Biosphere 2 experience APP early 2023.

## Next Steps:

Please detail the next steps for your project, numbering each step. (ie, 1. Connect with X Department to collaborate on the event, 2. Contact the catering options to confirm pricing, 3. Interview candidates for internship).

The produce production has been higher than anticipated and although both UArizona Campus Pantry and Impact of Southern Arizona have been able to distribute most of the produce, there are times when not all is distributed. We would like to ID another local pantry that could benefit from such materials to ensure all produce is utilized. We will continue to test new cultivars. It is anticipated will likely hire one more student over the summer, bringing the total to 4. We are also discussing possible capstone projects for next year

## Challenges Faced:

Please identify and describe any obstacles/roadblocks you or your team have experienced, and detail how you've managed them/ will manage them. Should your project already be completed, please note what challenges you faced and what you would do differently.

Probably the biggest challenge with running the Freight Farm has been the learning curve. There was a lot to learn about the farm and we had to learn it on the fly to get the farm up and running as quickly as possible. We have addressed this challenge by relying on our general knowledge of hydroponics systems and by using the Freight Farm Academy, an online course available to Freight Farm users. We have come a long way; even now, though, after six months, we are still learning different ways to run the farm more efficiently. A major challenge we faced after the farm was set up was maintaining internet connection to the farm. When the power to the farm was interrupted, during a storm during the summer, for example, the internet connection to B2 would frequently be knocked offline. If this happened, the entire farm would shut down because the farm's control is completely dependent upon the internet. We solved this challenge by installing new, more powerful antennas to the Freight Farm and to B2, which eliminated the problem. We still have daily challenges, of course, such as clogged emitters, bacterial and algal outbreaks in the tanks, and pH imbalances in the nutrient solution, but we strive to be resilient and resourceful in addressing these problems. When we have been unable solve a problem by ourselves, we consult Freight Farms or the UA CEAC for support.

## Project Support:

Can the CSF support you in addressing any roadblocks you've encountered? How else can the CSF support your project?

We have not encounter any roadblocks at this time. We look forward to our regular check-ins and would like to extend an invitation for the CSF team to visit Biosphere 2.

## Photo Link:

Please copy hyperlinks to photos here should you not be able to individually upload photos.

We have uploaded a number of photos but for additional photos and video please use this Link <https://arizona.box.com/s/79sz5f0se0pefnzyejj85765p8plnvxt>

The Capstone reports and harvest data are also in this box folder

## Media/Links:

Please include links to any media coverage or events information (e.g. news, social media, websites, interviews, etc.)

UA News Release: <https://news.arizona.edu/press-release/feeding-future-biosphere-2-delivers-first-lettuce-crop-campus-pantry-food-bank>

Story KVOA : [https://www.kvoa.com/video/1st-crop-of-lettuce-grown-in-container-farm-delivered-to-uarizona-campus-pantry/video\\_e143bb68-1409-5675-8a63-e9e391e65a17.html](https://www.kvoa.com/video/1st-crop-of-lettuce-grown-in-container-farm-delivered-to-uarizona-campus-pantry/video_e143bb68-1409-5675-8a63-e9e391e65a17.html)

Tweet From President Robbins:

<https://twitter.com/UArizonaPres/status/1559627188185583616>

KOLD News 13(Biosphere 2's Freight Farm, UA Students Find New ways to Grow Food):  
<https://www.kold.com/2022/11/15/shipping-container-green-machine-uas-biosphere-2-finds-new-ways-grow-food/>

Featured in Arizona Institute for Resilient Environments and Societies Newsletter The Dirt  
Featured in Freight Farm's recent Newsletter, went out to 37,000 subscribers