OFFICE OF SUSTAINABILITY
CAMPUS SUSTAINABILITY FUND

Sustainable Mushroom Cultivation on Buffelgrass

Grant Type
Mini Grant

Application Type
Final Application

Project Manager 1 Name
Alondra Cardona

Project Manager 1 Status
Student

Project Manager 1 Email
alondrac@arizona.edu

Project Manager 1 Department
The Astronomy Department

Project Manager 2 Name
Ryan Cotter

Project Manager 2 Email
ryanc2@arizona.edu

Project Manager 2 Status
Student

Project Manager 2 Department
Department of Chemical and Environmental Engineering

Project Manager 2 Role
Back-up

Project Advisor Name
Marc Orbach

Project Advisor Email
orbachmj@arizona.edu

Project Advisor Department
The School of Plant Sciences

Fiscal Officer
Jennifer Rascon

Fiscal Officer Email
jrascon1@arizona.edu

Fiscal Officer Department Name
The School of Plant Sciences

Requested Funding Amount

Only enter this number after completing the budget sheet (the budget template will round up your request).
Mini Grants may request $250 up to $5,000.
Annual Grants may request $5,001 up to $100,000, and up to three years of funding.

Year 1:
$300

Year 2:

Year 3:

Project Name
Sustainable Mushroom Cultivation on Buffelgrass

Primary Project Category
Natural Environment

Secondary Project Category
Food

Background and Context

Please provide relevant background about your organization/team including your mission and/or expertise. Lay out the rationale for the proposed project, focusing on the issue that your project would address. You may also share how the project is new or how it complements, builds upon, or scales existing initiatives. This section is meant to give us more information about you and the context for the project, while the questions below provide space to go into detail about your proposal's plan and specifics.

Response:

MycoCats is a student-led organization at the University of Arizona with a mission centered around

fostering hands-on experience in mycology, particularly in mushroom cultivation and education. Our club is a place for students to engage in foraging and cultivation while also offering a community to explore topics in mycology, including medicinal mushrooms, urban sustainability, and bioremediation. We support citizen science efforts, encouraging students to observe and record mushroom findings.

Our proposed project aligns directly with our mission by addressing the growing concern of buffelgrass, an invasive species threatening the Arizona ecosystem and saguaros. In collaboration with Sonoran Desert Weedwackers, Campus Pantry, and Cooking on Campus, we plan to repurpose buffelgrass pullings by experimenting with their potential as a substrate for growing mushrooms. This project offers an innovative solution for managing an invasive species while also exploring the role of fungi in sustainable agriculture.

We have established communication with the Campus Pantry, and they are enthusiastic about receiving mushroom donations. They have even offered a letter of support, providing assurance that our donations will be easily integrated into their food distribution system. This strengthens the community impact of our project by addressing both environmental and food security concerns on campus. We have also established communication with Sonoran Desert Weedwackers, and they have requested it to be a mutual effort where MycoCats volunteers contribute to the Weedwackers' removal efforts and, in return, gain access to the buffelgrass needed for the project. We have established communication with The Cooking on Campus program as well, for us to donate our cultivations for them to use and teach students how to cook with mushrooms.

Should the buffelgrass prove to be a viable substrate, the mushrooms cultivated will be donated. This project also builds on the club's existing work in sustainability and mushroom cultivation while fostering partnerships with other environmental groups and the campus community.

This project builds on the club's existing work in sustainability and mushroom cultivation and introduces a novel aspect of invasive species management. Long-term, the project will continue with oversight from the Vice President of Cultivation and President of MycoCats, ensuring it can grow as new members join. By expanding this initiative, we aim to scale it into a replicable model that can be adopted by other communities and individuals to help manage buffelgrass while contributing to sustainable food systems.

Project Description

Please provide a thorough description and explanation of your project. Be explicit in what your team is proposing. What will your project's outcomes be and how will you achieve them? Outcomes should be specific, measurable, achievable, realistic, and timely.

Response:

Our project proposes to explore the use of buffelgrass, an invasive grass species in Arizona, as a sustainable substrate for cultivating mushrooms. Buffelgrass threatens local ecosystems, and our approach aims to repurpose it for positive use. Alongside the Sonoran Desert Weedwackers, MycoCats members will regularly collect buffelgrass pullings, transport them to our grow space, and process them for mushroom cultivation. After collection, it will be transported to the grow space for processing. The buffelgrass will be shredded, soaked in water, and then sterilized using pressure cookers to eliminate contaminants. This sterilization step is crucial to prevent mold or bacteria from

interfering with mushroom growth. After sterilization, the buffelgrass will be inoculated with mushroom spawn using proper cultivation techniques. Controlled growth trials will be conducted, monitoring variables like moisture, temperature, and yield. This process ensures that the substrate is suitable for successful mushroom cultivation.
The goal is to test whether the grass can serve as a viable alternative substrate for mushroom growth, with a positive use for an invasive species. Should the mushrooms successfully grow, they will be donated to the UA Campus Pantry and the Cooking on Campus program, addressing both environmental and food security concerns.
We have two main project outcomes. The first is cultivating mushrooms with buffelgrass substrate. To measure this, we will conduct multiple cultivation trials, monitoring their growth rates, yield, and the health of the mushrooms. This will be achievable using resources, including sterilization equipment and inoculation materials. We aim to complete the initial trials within three months, allowing time for potential adjustments based on results.
Our second outcome is contributing to the Campus Pantry by donating successful mushroom harvests to help alleviate food insecurity. To measure this, we will record and report the quantity of mushrooms donated during each harvest cycle. With successful cultivations, each cycle will contribute fresh produce directly to the campus pantry. The first donation cycle is expected to begin after the initial 1-month growth trial.
While the project begins as a straightforward trial, we aim to expand it significantly. In the long term, our Vice President of Cultivation and President will manage and oversee the project, ensuring it remains sustainable and will continue into future semesters. We envision scaling the initiative by experimenting with other mushroom species, optimizing the buffelgrass substrate, and collaborating with other environmental organizations in an effort to increase volunteer numbers for buffelgrass pullings. Our ultimate goal is to create a replicable model that can be adopted by other campuses, local organizations, or individuals who want to learn how to cultivate their own mushrooms for food.

Timeline

Please provide a timeline breakdown for the key steps in your project. The timeline can be basic, but please include anticipated timeframes for each major step, including any key dates for when certain elements must start or be completed. The timeline can be in list format.

Response:

Mid to late November: First Growth Trial
Inoculate
Monitor and maintain optimal growing conditions
Collect data on growth and yield
Make any adjustments based on observations
Early November: Harvest and Analysis
Complete the first trial harvest of mushrooms
Analyze data from the trial and assess the viability of buffelgrass as a substrate.
Donate mushrooms to the campus pantry
Mid-November: Second Growth Trial
Inoculate and complete the second trial harvest

Continue monitoring
Donate mushrooms to the campus pantry
Early December: Final Analysis and Report
Compile a final report summarizing project outcomes, data, and future recommendations
Evaluate the potential for scaling or replicating the project.

Budget Narrative

Use this section to provide supplemental justification for the items you are requesting on your budget sheet. Please break down your justifications into the budget categories: Personnel or operating budget. Do not list out each expense or repeat notes made in the budget template, but instead address why the line items are being requested and the purpose they will serve, providing elaboration when necessary.
If you are requesting funding for personnel, use this section to elaborate on the position you are creating and how the budget and timeline was established for it. If you plan to hire students, describe in what capacity. Describe relevant details thoroughly (wages, responsibilities, duration of job, extent of involvement, how you will solicit/ market these opportunities etc.).
Ensure the descriptions match the line items in the budget sheet.
If matching or supporting funds are secured for the project, identify the source and amount in this section, and detail the impact of the matching funds on your overall budget.

Response:

The grant money would go directly towards materials for mushroom cultivation and the mushroom cultures. Different species of gourmet mushrooms will be tested to see which species are better suited for growing on the buffelgrass. In addition, equipment to maintain and propagate the cultures is needed to ensure further cultivation trials with the same strains. This includes materials like petri dishes, whole oats, and filter paper patches that can be used to plate mushroom strains and make more grain spawns for further cultivation trials. Furthermore, a small kitchen scale and cardboard produce containers would help us in the process of preparing the harvested mushrooms to be sent off to the campus pantry.

Project Feasibility and Logistics

The Campus Sustainability Fund will only fund projects that have completed the necessary work to ensure they can succeed, be completed in the grant's timeline, or have an accurate budget.
Please provide a description of the work that has been completed so far to make this project feasible. Please provide a description of the work that has been completed so far to make this project feasible. If relevant partners have been contacted/coordinated with, please identify them in your response.
For example, have you received consent or authorization to complete your project (such as from Housing and Residence Life, Facilities Management, Parking and Transportation, etc.)? If you are making modifications to campus, do you have written authorization or official quotes from Facilities Management to accurately identify the cost of labor and supplies?

Response:

Since spring 2024, MycoCats has partnered with the Controlled Environment Agriculture Center (CEAC) for access to greenhouse space for mushroom cultivation. We currently have an area in one of the CEAC student greenhouses in which we have been able to cultivate mushrooms on a very small scale. We have also reached out to Campus Pantry and have received approval for possible future donations of fresh mushrooms. In addition, we also already have access to lab equipment such as an autoclave and a flow hood needed to sterilize the substrate and inoculate it through Dr. Orbach's lab (club advisor of MycoCats). This means we already have access to the facilities necessary to make this project a success, as well as extensive experience and knowledge in mushroom cultivation.

Environmental Sustainability Outcomes

Please provide a description of how you expect your project to advance environmental sustainability on campus. A definition of environmental sustainability is provided on our Guides and Tips page.

Response:

Our project advances environmental sustainability on campus by addressing the management of invasive species and sustainable food production.
First, the project focuses on utilizing buffelgrass, an invasive species that poses a significant threat to local ecosystems, as a resource. Our club members will participate in removal efforts with a group actively managing this issue. Sonoran Desert Weedwackers is an already established volunteer group with the Pima County Conservation Lands and Resources. Our club members will attend their regularly scheduled buffelgrass removal sessions, contributing volunteer hours to their ongoing efforts. MycoCats is not organizing these pullings; rather, we are joining their established volunteer sessions to gain access to buffelgrass for our project and support their conservation goals. By doing so, we are helping manage this invasive species and prevent it from further damaging native biodiversity. We will leverage our campus reach and social media accounts to encourage students outside of our organization to partake in this volunteer opportunity with Sonoran Desert Weedwackers. This will increase overall awareness and inspire students to engage in impactful volunteer work. Then, instead of allowing buffelgrass to proliferate and degrade natural habitats, we turn this invasive grass into a substrate for growing mushrooms, a more ecological approach. Additionally, by repurposing buffelgrass as a substrate for mushroom cultivation, we prevent it from going to waste. The project promotes sustainable food production by cultivating mushrooms on an otherwise discarded material. Traditional mushroom cultivation often requires substrates like straw or hardwoods. By experimenting with buffelgrass as an alternative substrate, we can reduce the strain on these resources while transforming waste into a food source. This project will also educate the campus community about invasive species management and sustainable agriculture, as mushrooms grown will be donated to the Campus Pantry and the Cooking on Campus program.

Social Sustainability Outcomes

Please provide a description of how you expect your project to advance social sustainability on campus. A definition of social sustainability is provided on our Guides and Tips page.

Response:

Our project advances social sustainability on campus by directly addressing food insecurity and creating a collaborative environment for students to be involved in community-focused initiatives, such as buffelgrass pulls. We are not only addressing an environmental issue but also experimenting with creating a sustainable food source that benefits the students directly.
Our primary goal is to donate viable mushrooms to the Campus Pantry to help provide nutritious food to students who may be facing food insecurity–an issue that disproportionately affects low-income and marginalized communities including BIPOC students. Ensuring access to fresh produce improves overall well-being and academic success of students, contributing to a more equitable campus environment.
In addition to donations, we aim to collaborate with the university's Cooking on Campus program. This partnership would allow us to use harvested mushrooms to teach students cooking skills in a hands-on setting. Students attending these workshops can prepare meals with the mushrooms and take home what they make, providing immediate food benefits while building those practical skills. We would like to highlight this approach as an alternative form of distribution if yields are modest, therefore ensuring the mushrooms serve students in the most impactful way.
The project highlights the interconnectedness of environmental and social issues. Buffelgrass exacerbated environmental degradation, impacting communities who rely on ecosystem services for resources or mental well-being. By turning buffelgrass into a resource for food production, we partake in environmental justice and provide immediate benefits to students in need.

Student Leadership & Involvement

Please provide a description of how your project will benefit students on campus regarding the creation of leadership opportunities or student engagement. What leadership opportunities exist within your proposal? If you plan to seek student involvement, include relevant details thoroughly and how you will solicit/ market these opportunities.

Response:

Our project will benefit students on campus by making mushrooms easily accessible while fostering leadership and involvement opportunities within environmental sustainability. Within MycoCats, all students can volunteer their time to join buffelgrass-pulling events hosted by Sonoran Desert Weedwackers. We will extend this opportunity beyond MycoCats by promoting the buffelgrass-pulling events to all students through social media and university channels. In our last buffelgrass pull, we met students from the Epsilon Eta Fraternity who also volunteered their time. This shows a potential collaboration with other environmental groups to join us in these pulls.
Students in MycoCats will be able to learn first-hand from the Vice President of Cultivation how to cultivate mushrooms to keep the project ongoing and pass down the information within the club for years to come. We plan to have a CONEX on the campus grounds, making it easy for students in the

club to learn and check in on the cultivation.
For the donation aspect, we have coordinated with the Campus Pantry and established a plan for mushroom drop-offs, assuming our cultivation success. Our Vice President of Cultivation and designated student volunteers will harvest, pack, and transport mushrooms to the pantry. If mushrooms are also donated to the Cooking on Campus program, we will coordinate similar logistics, managing donation drop-offs with clear roles and schedules. This will ensure the campus community efficiently uses the mushrooms and keeps the mushrooms fresh.
Our project will actively engage students in sustainability efforts, thus creating a feedback loop of environmental awareness and community impact on campus.

Education, Outreach, and Behavior Change

What opportunities does this project provide for members of the campus/community to learn about sustainability? How will your project educate the campus community and/or incorporate outreach and behavior change, particularly those who are not currently engaged with sustainability or environmental work? Please provide a description of how you expect your project will communicate its impacts to the campus community.

Response:

Our project offers multiple opportunities for both the campus and the broader community to learn about sustainability and the ecological impact of invasive species.
Throughout the project, we will provide demonstrations to our club members and groups interested in growing mushrooms using repurposed materials like buffelgrass. These hands-on sessions will occur in general club meetings. These events will be advertised via MycoCats' social media and listservs, encouraging attendance from students outside the club.
Our collaboration with Cooking on Campus is in hopes to expand outreach beyond our club. A portion of our harvested mushrooms will be donated to this program, where they will be used in cooking workshops that teach students practical culinary skill.s. This will allow participants to prepare meals with the mushrooms, increasing food access while also learning about the project's environmental impact.
In our donations to Campus Pantry, we will include informational cards with the portioned mushrooms that say, "This mushroom was sustainably grown on buffelgrass." The back side will emphasize the ecological impact of buffelgrass removal. This direct communication will educate pantry users about our project and the connection between environmental and social sustainability.
We will utilize MycoCats' social media pages and university listservs to educate the campus community and alumni who follow us about the positive outcomes that can derive from our project by decreasing food insecurity and the impact of buffelgrass. This can look like "behind-the-scenes" of cultivation, growth stages, showcasing students volunteering, etc.
By employing these strategies, we aim to raise awareness of environmental sustainability and its connection to sustainable food systems, thus encouraging students to think critically about more potential solutions and to get involved.