

WIP Updates and Sustainability

As a note:

We are asking that these sheets are returned filled out by the next reporting deadline, and that all meetings are scheduled and in the calendar by the next reporting deadline as well. All projects should schedule a meeting time for between the dates of October 20th- October 31st. The sustainability review meetings will be held during those two weeks, so please ensure that everything is in order for meeting with PM team members for sustainability planning.

Processes for reporting will be changing come October. Please watch your emails for updates on these processes before the next reporting deadline! The next reporting deadline is 10.10.2025.

Project: Controlled Environment Agriculture (CEA)

Lead: Carmela Rosaria Guadagno

Date: October 2025

Sustainability and Future Planning Questionnaire

This questionnaire is designed to gather key insights into the long-term sustainability of the project, focusing on plans for continued operations and success after Phase III, Year 2 of WIP funding period concludes.

Section 1: Financial Sustainability

1. What is the current estimated operational budget required to maintain the project's core functions on an annual basis?
 - a. The cornerstone of the CEA project is the transdisciplinary course **AGRI4990 – Controlled Environment Agriculture (CEA) Principles & Applications**. This class serves as the primary educational and outreach platform for integrating research, industry collaboration, and student experiential learning within the newly launched CEA Network <https://www.uwyo.edu/news/2025/10/uw-launches-controlled-environment-agriculture-network.html>.
In 2024, the course cost approximately \$110,000, and in 2025, expenses decreased to about \$70,000. A detailed breakdown of 2025 summer costs include: \$6,000 – waived credit fees; \$13,000 – stipends for 10 students; \$25,000 – instructors stipends, honoraria, travel, and lodging for guest speakers; \$10,000 – lodging for community college and out-of-state students; \$9,000 – student meal plans; \$7,000 – class materials and group events. The higher costs in 2024 were primarily due to increased student stipends (\$1,800 vs. \$1,300 in 2025) and initial investments in materials and equipment to support student research projects. Looking ahead, the projected cost to sustain this course long-term is approximately **\$40,000 per year**. This estimate assumes continued and growing student participation, with their stipends gradually replaced by industry- and lab-based internships facilitated through the expanding CEA Workforce Development Network. Lodging for out-of-state and community college

students will continue to be offered for the next one or two years on current fundings, although meal coverage will be discontinued beginning summer 2026. Additionally, we are exploring the integration of AGRI4990 into the Course-Based Undergraduate Research Experience (CURE) model currently proposed at UW Science Institute. Incorporation into this framework – supported by the National Science Foundation (NSF) has the potential to further reduce annual costs through shared infrastructure and funding mechanisms while enhancing the course's research impact and scalability across disciplines. Finally, the course should stem into an actual CEA curriculum developed cross-colleges for which initial discussion has started (Estimated time for the curriculum release: academic year 2028-2029).

- b. The nascent **CEA network** that puts together businesses and institutions interested in integrated workforce development has the potentials to be self-sustained through minimal annual fundings offered by the participants and extra-mural grant opportunities. To maintain the framework of the network with media and marketing coverage we expect an annual expense of ~\$12,000, for the next two years after June 2026 supported through the UW Center for Controlled Environment Agriculture.
 - c. To support **infrastructure maintenance, research and innovation** for CEA at UW we estimate an annual cost of \$78-80k potentially secured by extramural grants and partly by the fee-for service of the phenotyper at the Plant Growth & Phenotyping Facility (PGPF).
2. What is your strategy for securing external funding and grants to ensure the project's long-term financial viability? Are there specific grant opportunities or funding sources you have already identified?
- Our strategy for ensuring long-term viability consists of three parallel approaches:
- a. Make CEA a continue academic offer at UW and define self-sustainable strategies in within a new CEA curriculum
 - b. Collaborate with CCs in Wyoming and local companies for corroborating the value of academia-business collaborations for research opportunities and workforce development. Seek the support of stakeholders in the state such as the Wyoming Business Council to strengthen CEA across our territory towards economic sustainability.
 - c. Apply for extra-mural fundings, these are opportunities already identified: NSF EPSCoR E-Core (EPSCoR Collaborations for Optimizing Research Ecosystems Research Infrastructure Improvement), NSF REU Bio focus (Research for Undergraduate Experience), USDA NIFA/AFRI (Sustainable agricultural systems), USDA UIE (Urban, Indoor and Emerging Agriculture), Test bed: toward a network of programmable cloud laboratories (PCL Test Bed).
3. Are there plans to develop revenue-generating activities, such as offering fee-for-service programs, consulting, or any marketing services or products, to support the project's ongoing costs? Yes, there are three main revenues to generate revenues for sustainability: a. fee-for-service of the phenotyper at the PGPF will partly sustain CEA activities at the Facility b. The continue offer of AGRI4990 will reach a self-sustainable point when students will be regularly paying for the fees c. The CEA network offers unlimited number of opportunities for business support and funded research/innovation/student internships.

4. Have you explored any opportunities to reduce operational costs or streamline project activities to enhance financial efficiency in the long term? Mainly, we have focused on reducing the operational costs for AGRI4990. As reported above, costs went from \$110k in 2024 to ~\$70k in 2025 and we expect a supplemental decrease to ~\$40k for summer of 2026.

Section 2: Programmatic and Operational Sustainability

5. What is the plan for continuing key project activities, workshops, and educational offerings once WIP funding ends? Will there be any expanding or changes to your scope of work? As reported above, at UW we plan to make CEA a continue new offer for our campus in incremental steps from AGRI4990. First as part of a CURE program, then collaborating in developing credentials with other schools around the United States and finally, building a cross-college curriculum in CEA.
6. How will you maintain and leverage existing partnerships to continue to support your project and its goals? Partnerships as the one with Central Wyoming College and the CEA Network in general have been built on mutual interests and this interest will not disappear with the end of the program. We are all keen in building a new workforce for CEA and make this industry a long-term opportunity for Wyoming.
7. What is your strategy for ensuring the knowledge, skills, and resources developed during the WIP phase are preserved and transferred to new team members, business clients, and partners? The CEA network itself was built to ensure shared knowledge and WIP deliverables will be leveraged during new efforts across academia and business partners.
8. How do you plan to measure the project's success and impact on its target audience (e.g., students, industry partners, community) beyond the initial funding timeline? Once again, the CEA network embeds a collaborative data sharing opportunity that we will use for success and impacts in the next few years. The class AGRI4990 will be reviewed yearly by students, instructors and guest speakers through monitored surveys as already done in 2024 and 2025.

Section 3: Long-Term Vision

9. What is the ultimate long-term vision for this project? How do you see it evolving over the next years, past the deadline of June 30th, 2026? Our overarching vision is to position Wyoming as a national hub for Controlled Environment Agriculture—a place where innovation, education, and industry collaboration converge. UW, together with

our founding and emerging partners, remains deeply committed to advancing this mission well beyond June 2026. We envision the continued development of a comprehensive CEA curriculum at UW, complemented by articulation agreements with in-state and out-of-state community colleges to support credential and digital badge programs. This framework will create clear academic and workforce pathways, empowering students with skills directly aligned with industry needs. Through these efforts, we are cultivating a dynamic statewide ecosystem—one fueled by growing public and private interest in CEA, robust educational opportunities, and partnerships that connect academia, industry, and communities. Ultimately, this initiative will enable our students to build meaningful careers in Wyoming’s emerging CEA sector or gain experience elsewhere and return home equipped to drive innovation and add value to their communities.

9. What specific metrics or outcomes will you track to demonstrate the project's value and justify continued investment from stakeholders?

Some of the metrics used will be:

- Number of students taking AGRI4990
- Cross-college interest in developing a CEA curriculum at UW
- Number of industry and academic partners in the CEA network
- Number of internship opportunities
- Number of collaborative research projects in the network
- Use of the phenotyper platform

10. Are there any potential challenges or risks to the project's sustainability that you have identified, and what is your plan to mitigate them? CEA is still a relatively new concept in much of Wyoming. Broader community understanding and buy-in will be key to growing demand, investment, and student participation. Currently, we have been leveraging expertise in the UW Science Institute to plug in CEA activities in existing programs such as STEM-ology days, STEM days across the state and the Road Show. In November 2025 STEM-ology days <https://wyomingspacegrant.org/stem-ology/> will focus on CEA with a toddler day, a senior day, and a large community day (all ages) for a total of over 150 community members expected to learn about CEA and participate in hands-on activities and tours of the PGPF.