Glendale College Foundation Faculty & Staff Grant Draft

GCC Garden Biochar + FarmBot Precision Agriculture Pilot

Updated version including biochar material costs and FarmBot Genesis automation infrastructure

Applicant note: This is a paste-ready draft. Replace bracketed placeholders with the faculty/staff applicant, department, dean/department head, and final phone/email. Because this is a Faculty and Staff Grant, a GCC faculty/staff member should serve as applicant or official sponsor if the project is student-led.

Procurement note: The budget includes biochar test material at the prices provided by the student project lead. If any biochar supplier is affiliated with project personnel, the official applicant should disclose that relationship and follow GCC/Foundation procurement, conflict-of-interest, and reimbursement rules. If needed, this line item can be fulfilled by an approved equivalent supplier while preserving the experimental design.

Important timing note: The uploaded question sheet states the 2026-2027 online deadline was Friday, May 29, 2026 at 11:59 pm. Use this draft if you have an extension, were invited to complete a pending application, or are adapting it for a future/internal opportunity.

Section 1: Applicant

Name	Andrew Feldman
GCC Position	Department Chair
Department	Culinary Arts, Nutrition, and Hospitality & Tourism
Campus	Verdugo
E-mail	afeldman@glendale.edu
Phone	ext. 3256
Dean or Department Head's Name	Andrew Feldman
Student project lead	Joseph Kingsley, Space & Rocketry Club President

Section 2: Project Proposal

Name of Project/Program	GCC Garden Biochar + FarmBot Precision Agriculture Pilot: Student-Led Research in Sustainable Agriculture, Soil Carbon, and Automation
Category	Science & Technology; secondary fit: College Operations & Facilities / Other: Sustainability
Amount requested	$9,975
Project location	GCC Verdugo campus community garden / selected garden beds

1. What do you propose to do?

I propose to establish a student-led GCC Garden Biochar + FarmBot Precision Agriculture Pilot in the GCC community garden. The project will use the garden as a living laboratory to compare plant growth, soil moisture retention, and basic soil-health indicators across raised-bed treatments: a control bed condition, compost-only amendment, raw biochar amendment, and inoculated biochar/compost amendment. The updated project also adds a FarmBot Genesis automation platform so students can learn how precision agriculture, robotics, sensors, and repeatable watering/planting routines can support soil and plant research.

The goal is not to promote a product, but to test and document whether biochar and automated garden management can improve soil performance in a transparent, measurable, and repeatable way. The FarmBot station will serve as a research and demonstration bed where students can program watering/seeding routines, collect sensor and camera

observations, compare automated care to conventional garden maintenance, and develop a campus model for data-informed sustainable agriculture.

The pilot will rehabilitate or improve selected garden beds, create clearly labeled experimental plots, install one FarmBot-supported demonstration/research bed, and support hands-on student learning in sustainability, biology, chemistry, environmental science, engineering, robotics, coding, data collection, and campus stewardship. Students will participate in bed preparation, planting, measurement, FarmBot setup and operation, documentation, and interpretation of results. Final deliverables will include a short written report, a simple data dashboard or spreadsheet, educational signage in the garden, photo documentation, and recommendations for future GCC garden use.

2. Who will be involved in the project/program?

The project will be led by the faculty/staff applicant or sponsor in partnership with student project lead Joseph Kingsley, President of the Space & Rocketry Club. Student volunteers from the Space & Rocketry Club and other interested clubs or classes may participate in garden workdays, data collection, FarmBot setup/operation, maintenance, and documentation. Depending on department interest, the project can also invite collaboration from biology, chemistry, earth/environmental science, engineering, computer science, nutrition, culinary, horticulture, and sustainability-related courses or programs.

Facilities/garden staff or the relevant department head will be consulted before any installation, FarmBot mounting, bed modification, water connection, electrical extension, signage, or alteration of garden infrastructure. The project is designed to avoid contracted labor, travel, or complex procurement unless required by GCC procedures. Faculty/staff oversight will ensure safety, alignment with campus policies, procurement compliance, and continuity beyond one student leader.

3. What are the benefits of this project/program to the students, college, and the community?

For students, the project creates a hands-on research and technology opportunity that turns sustainability from an abstract concept into measurable practice. Students will learn experimental design, controls, data collection, soil testing, basic statistics, plant observation, documentation, robotics-supported agriculture, and honest interpretation of results, including the possibility that a treatment may not outperform the control. This supports critical thinking, inquiry-based learning, and applied STEM skills.

For the college, the project improves an existing campus space, builds a model for interdisciplinary collaboration, and generates data that can guide future garden use. The FarmBot component creates a durable instructional asset for repeated use by clubs, classes, and future projects. It also demonstrates how a campus garden can become a living laboratory for sustainability, automation, water conservation, soil science, and student engagement.

For the community, the project can support outreach around composting, soil health, urban agriculture, carbon cycling, water conservation, food systems, and practical climate-resilience strategies. If successful, the garden can host brief tours, class visits, or community-facing demonstrations showing how soil amendments, student research, and accessible automation can make campus green spaces more productive and educational.

4. How does this project/program support the College's Institutional Strategic Plan?

This project supports GCC's 2025-2030 Institutional Strategic Plan by advancing Inclusion, Success, and Support through a visible, student-centered, data-informed sustainability and technology project. It supports Inclusion by creating a welcoming outdoor learning space where students from clubs, classes, and different majors can participate without expensive personal materials or prerequisites. It supports Success by giving students a practical, inquiry-based project that connects classroom learning to real-world environmental, technical, and data problems. It supports Support by improving a physical campus resource and creating a repeatable model for garden stewardship.

The project also aligns with GCC values of educational excellence, sustainability and stewardship, community building, and student agency. Students will not only use the garden; they will help design, automate, measure, interpret, and communicate the work. The FarmBot element strengthens the project by linking sustainability to current technology fields such as robotics, computer-controlled systems, sensor-based monitoring, and precision agriculture. The project therefore connects campus facilities, student engagement, experiential learning, and continuous improvement in a way that can be scaled or adapted by future classes and clubs.

5. Timeline for the project/program.

- August-September 2026: Confirm faculty/staff sponsor, department approval, garden-bed access, safety expectations, procurement requirements, and final project layout. Request or confirm FarmBot quote if required by purchasing. Purchase approved materials. Map beds, label treatments, and collect baseline soil measurements.
- September-October 2026: Prepare beds, apply standardized treatments, build or adapt the FarmBot-supported bed, assemble/install FarmBot with approved water/electrical/internet support, and plant the first trial crop. Host initial student workday and orientation.
- October-December 2026: Collect weekly data on germination, plant survival, plant height, visual health, soil moisture, FarmBot watering/maintenance logs, and garden maintenance needs. Maintain photo documentation and a shared data spreadsheet. Produce a brief fall progress update.
- January-February 2027: Review fall results, troubleshoot FarmBot workflows if needed, adjust methods while preserving the experimental structure, and prepare the spring planting cycle.
- March-May 2027: Run spring trial, continue weekly data collection, host class/club visits or garden workdays, and install/update educational signage explaining biochar, soil carbon, and precision agriculture.
- June 2027: Analyze results, prepare a final report and presentation summary, recognize Foundation support, and submit recommendations for continuing, expanding, or modifying the garden pilot.

6. How do you propose to use the funds requested? Please include specific budget information.

Requested amount: $9,975.

The revised budget adds two items that materially strengthen the project: (1) standardized raw and inoculated biochar test material, and (2) a FarmBot Genesis automation platform that can remain as reusable instructional infrastructure for the GCC garden. The requested funds would be used as follows:

- FarmBot Genesis v1.8 automation platform: 1 kit x $5,995 = $5,995. Durable precision-agriculture platform for automated seeding/watering, soil sensing, camera documentation, and repeatable student experiments.
- FarmBot garden installation and support infrastructure: allowance = $650. Raised-bed mounting/anchoring materials, approved hose/electrical extension support, weatherproof storage, Wi-Fi support if needed, and installation consumables.
- Inoculated biochar test material: 10 x 5-gallon units at $95 = $950. Standardized inoculated biochar material for treatment beds and the FarmBot demonstration bed.
- Raw biochar test material: 10 x 5-gallon units at $80 = $800. Raw biochar comparison material; raw 5-gallon price is $15 less than the 5-gallon inoculated price.
- Soil testing and measurement supplies: allowance = $500. Baseline and post-cycle soil tests where feasible, pH/moisture tools, data sheets, and related measurement materials.
- Seeds, plant starts, compost, and standard amendments: allowance = $300. Standardized crop materials and non-biochar amendments needed to compare treatment and control beds.
- Irrigation, hose, timer, and monitoring supports: allowance = $350. Drip/hose supplies, timers, couplers, and basic garden supports needed for comparable watering and FarmBot operation.

- Garden tools, safety, labels, and storage supplies: allowance = $250. Hand tools, gloves, eye protection where needed, labels, buckets, lids, and safe handling/storage supplies.
- Educational signage, recognition, and reporting materials: allowance = $180. Weather-resistant bed labels, Foundation recognition sign, QR-code project information, poster/display, and report materials.
- **Total requested: $9,975.**

Biochar pricing used in this budget: inoculated biochar is priced at $95 per 5-gallon unit, $65 per 3-gallon unit, and $35 per 1-gallon unit. Raw biochar is priced at $15 less per corresponding package size; therefore, raw biochar is budgeted at $80 per 5-gallon unit, $50 per 3-gallon unit, and $20 per 1-gallon unit. This proposal budgets 10 five-gallon units of inoculated biochar and 10 five-gallon units of raw biochar, for 100 total gallons of biochar test material.

No funds are requested for travel, salary, honoraria, or contracted labor. If the Foundation prefers to cap equipment funding, the FarmBot line item could be treated as the primary durable-equipment request while the biochar/materials line items remain the minimum project-startup package.

7. Please list any other sources of funding you have applied for and include dollar amounts if already awarded.

No other external funding has been awarded at this time. In-kind support may include student volunteer hours, existing garden space, existing club/community interest, existing hand tools or garden supplies where approved, and donated or low-cost organic feedstock/materials when approved for campus use. If additional campus, club, department, Foundation, community, or equipment support is secured, it will be documented and reported to the Foundation.

If the full FarmBot amount exceeds the preferred Faculty and Staff Grant range, the applicant may also seek department, sustainability, STEM, equipment, or donor co-funding while keeping the biochar comparison study active at a smaller scale.

8. How will the Foundation's support be recognized?

Foundation support will be recognized on weather-resistant project signage in the garden, on the FarmBot demonstration/research station if allowed, on any project poster or presentation materials, and in the final written report. Recognition language may read: 'This GCC Garden Biochar + FarmBot Precision Agriculture Pilot is made possible with support from the Glendale College Foundation Faculty and Staff Grant Program.'

If the project is shared through a class visit, club meeting, campus sustainability event, STEM demonstration, or community presentation, the Foundation will be acknowledged verbally and in any handouts or slides. Photos of signage, FarmBot installation, student workdays, and project progress can also be provided to the Foundation for stewardship and communications use, subject to campus policies and any student photo permissions.

9. How do you plan to evaluate this project's success?

Success will be evaluated through measurable garden outcomes, FarmBot/automation outcomes, and student-engagement outcomes. Garden measures may include baseline and post-project soil indicators, soil moisture retention after watering, germination rate, plant survival, plant height, visual plant-health ratings, yield/biomass where appropriate, and maintenance observations. The project will compare treatment beds against control conditions rather than relying on impressions alone.

FarmBot/automation outcomes may include successful installation and safe operation, number of completed automated watering or planting routines, consistency of watering records, usable sensor/camera observations, student-created FarmBot workflows, and comparison of automated care logs against manual garden observations. These measures will show whether the automation platform improves repeatability, student learning, or data quality.

Student and campus outcomes may include number of student participants, number of workdays or class/club visits, hours of student engagement, completed data sheets, completion of a final report, student reflections, and the

creation of signage or public-facing educational materials. The project will be considered successful if it produces usable data, improves garden organization and visibility, establishes a reusable FarmBot learning station, and gives students a meaningful applied-learning experience, even if the data show mixed or unexpected results.

10. If your project/program is successful, how will it inform your practice moving forward?

If successful, the project will provide GCC with a repeatable model for using the community garden as a living laboratory for both soil science and applied technology. The methods, data sheets, FarmBot workflows, signage templates, budget lessons, and results can be reused by future clubs, classes, faculty, or sustainability projects. The results will help determine whether raw biochar, inoculated biochar, compost, or combined amendment strategies deserve further testing or expansion in GCC garden beds.

The project will also inform future practice by showing how student-led research can connect science, technology, environmental stewardship, automation, and community engagement. It can become a foundation for future interdisciplinary garden modules, student research posters, service-learning activities, data-science assignments, robotics demonstrations, or partnerships with local schools and community groups.

11. Please provide a 2-3 sentence summary of your project proposal.

The GCC Garden Biochar + FarmBot Precision Agriculture Pilot will transform selected garden beds into a student-led living laboratory comparing control, compost, raw biochar, and inoculated biochar treatments while adding a FarmBot Genesis station for precision agriculture, automation, and repeatable data collection. Students will collect soil, plant-growth, water-retention, automation, and participation data while learning experimental design, sustainability, robotics-supported agriculture, and campus stewardship. Foundation support will fund the FarmBot platform, standardized biochar test material, measurement tools, garden supplies, signage, and documentation needed to produce a useful final report and a repeatable model for future GCC garden projects.

Section 3: Signatures and Acknowledgements

Before submission, confirm the following with the official faculty/staff applicant:

- Dean or department head is aware of and has authorized the application.
- Garden access, safety expectations, and facilities/department permissions are confirmed before purchases, FarmBot installation, water connection, electrical support, signage, or bed modification.
- Procurement and conflict-of-interest rules are reviewed if biochar is purchased from any supplier affiliated with project personnel.
- No temporary/contracted professionals are included in this draft budget unless GCC Human Resources and procurement requirements are completed first.
- No conference or travel funds are included in this draft budget.