



DEPARTMENT OF PESTICIDE REGULATION RESEARCH GRANTS PROGRAM 2025 SUPPLEMENTAL GUIDANCE DOCUMENTS

TABLE OF CONTENTS

RESEARCH GRANTS PROPOSAL APPLICATION OVERVIEW	1
RESEARCH GRANTS FREQUENTLY ASKED QUESTIONS	3
About the Research Grants Program	3
Who Can Apply	4
Funding Priorities, Funding Decisions & Specific Project Types.....	4
Experimental Design & Statistical Analyses	5
Federal and Tribal Entities.....	5
What Can Be Included in a Budget.....	5
How to Complete/Develop a Budget	6
Subcontracts/Subawards/Subrecipients.....	9
SAMPLE RESEARCH GRANT SCOPE OF WORK AND BUDGET	11

RESEARCH GRANTS PROPOSAL APPLICATION OVERVIEW

I. GETTING STARTED WITH YOUR RESEARCH GRANT PROPOSAL APPLICATION

Here are some tips and recommendations to help you get started with your proposal application:

- Carefully review the 2025 Research Grants [Solicitation](#).
- Visit the Research Grants [webpage](#) to find all the documents you will need to apply, as well as to review past funded projects.
- Review the “Considerations for Developing Your Proposal Application” in Section II of this document for additional information that will aid you in creating a complete proposal.
- Familiarize yourself with the “Ranking Considerations for Reviewers” section of the 2025 Research Grants [Solicitation](#) to identify the criteria that will guide DPR staff and Pest

Management Advisory Committee (PMAC) members when reviewing proposal applications and placing proposal applications in rank order.

- Complete all mandatory documents, and any desired optional documents, and submit them with the [proposal application](#).
- Please contact IPMGrants@cdpr.ca.gov with any additional questions you may have, or consider requesting an appointment to discuss your application using [this form](#).

II. CONSIDERATIONS FOR DEVELOPING YOUR PROPOSAL APPLICATION

The following additional information and/or consideration points may assist you in developing a complete and competitive proposal.

1. **Proposals must be a good fit to the funding priority stated in the solicitation.**

DPR is soliciting Research Grant proposal applications that seek to develop methods or practices that reduce risks associated with pesticides of high regulatory interest, which can be incorporated into an integrated pest management (IPM) system in agricultural, urban, or wildland settings. Examples of projects that may contribute to an IPM system include but are not limited to: refining decision-making for pest management; evaluating alternatives for replacement of pesticides of high regulatory interest; enhancing integration of pest management practices; improving application technologies; increasing cost effectiveness of reduced-risk practices; and/or using modeling or meta-analyses to advance IPM. Successful applications will provide strong evidence of the usage of pesticides of high regulatory interest and support for the project's potential to reduce or eliminate this usage.

The project must focus primarily on research. Projects primarily pursuing IPM outreach and/or implementation should apply to DPR's [Alliance Grants Program](#).

For more information on specific funding priority topic areas for the [2025 Research Grant Solicitation](#), please refer to Frequently Asked Question (FAQ) 6 on funding priorities in the "Research Grants Frequently Asked Questions" section below.

2. **The project's design and methods must be clearly stated in sufficient detail for reviewers to evaluate their feasibility and the likelihood of successful implementation.**

Descriptions of key elements of the experimental design and methods should be clear and concise. We recommend including the optional experimental design and methods illustrative graphics as appropriate.

Please note that it is not sufficient to state general methods such as "the data will be evaluated using ANOVA" or "the results will be analyzed using a randomized complete block design."

3. **Ensure the budget aligns with the work being performed and is fully justified.**

Reviewers sometimes find it difficult to reconcile the amount of money being requested with the work proposed to be performed. In some cases, the amount may seem inadequate; and in others, overestimated. Please be clear and thorough in justifying the project's budget in the budget justification section of the scope of work and budget information and double check all calculations in

the budget tables worksheet and any needed subaward budget tables worksheets. Note that DPR cannot fund out-of-state travel.

If you need help developing your budget, please consider watching our informational video on [“Budgets and Budget Justifications.”](#)

- 4. Ensure all personnel and staff belong to the same organization as the grantee’s principal investigator.**
To receive grant funds as personnel, staff must be paid through the same organization as the principal investigator (see the terms and conditions section of the grant agreement template for who can be a principal investigator). If staff cannot receive funds through the principal investigator’s organization, they must instead be listed as subcontractors. Research team members who are members of an entity submitting a budget and who will donate their time, resources, etc. in kind and will not be receiving grant funds can be listed as personnel for that entity.
- 5. The proposed project must be a ‘stand-alone’ project even if it is a component of a larger endeavor.**
If all external aspects of the endeavor were removed, the DPR-funded project must still be able to achieve all objectives and deliverables with the amount funded under the grant agreement. Additionally, the project budget should not contain funds that support activities outside of the described scope of work. Please note that this requirement precludes any sources of matching funding.
- 6. The full text of each key cited reference (limited to a maximum of five references) supporting the proposal’s merits, whether the reference is an unpublished report or a published paper, must be provided as a PDF document.**
Key cited documents supporting your proposal application are an important way to show the viability of your idea. Key cited documents that show the efficacy of an idea, economic feasibility, and potential value to the public can significantly strengthen a proposal application’s merits.

RESEARCH GRANTS FREQUENTLY ASKED QUESTIONS

GENERAL QUESTIONS ABOUT THE RESEARCH GRANTS PROGRAM

- 1. How do Alliance Grants differ from Research Grants?**
DPR’s two grant programs comprehensively promote IPM advancement by funding both new IPM knowledge development as well as IPM knowledge-sharing and implementation. The Research Grants Program funds the research and development of new IPM tools and practices while the Alliance Grants Program funds the implementation, expansion, and/or adoption of effective, proven, and affordable IPM practices at the user level. Knowledge gained from a DPR Research Grant could be a great source for an eventual Alliance Grant proposal. If you’re struggling to decide which program your ideas fit into best, please reference our [“DPR’s Grants Programs – Purpose and Priorities”](#) informational video.
- 2. Can work be conducted outside the state of California?**
Yes. However, work conducted outside of California must be in California-like conditions and the project must benefit Californians. Additionally, note that travel outside of California cannot be funded.
- 3. Can multiple applications for different projects be submitted?**

Yes. Principal investigators and institutions may submit multiple proposal applications for funding. Proposals are evaluated independently, and DPR has made multiple awards to the same principal investigator in a single funding cycle. However, principal investigators should be mindful and ensure they are capable of successfully completing the required tasks for all proposals submitted and any ongoing work consistent with DPR’s “Reasonable Efforts” term and condition.

QUESTIONS ABOUT WHO CAN APPLY

4. Am I eligible to apply for a Research Grant?

All principal investigators, key personnel, subawardees, subcontractors, and consultants must meet all eligibility requirements laid out in the “Eligibility Requirements” section of the [2025 Research Grants Solicitation](#).

5. Can private entities apply?

Yes. Please note that all DPR grant recipients are bound by the terms and conditions laid out on our website, including provisions concerning public use of data and project results. Please review all terms and conditions carefully before applying.

QUESTIONS ABOUT FUNDING PRIORITIES, FUNDING DECISIONS & SPECIFIC PROJECT TYPES

6. Are there any funding priorities?

Yes. For 2025, DPR has identified the following priority topic areas:

- IPM for underserved or disadvantaged communities;
- Decreasing the use of pesticides of high regulatory interest (such as fumigants like 1,3-dichloropropene or sulfuryl fluoride);
- Advancement of urban IPM and safer, more sustainable pest management tools and strategies in urban settings;
- Advancement of IPM and safer, more sustainable pest management tools and strategies in agricultural settings adjacent to or near a school(s);
- Meeting the IPM needs of small growers; and/or
- **TWO or more** of the three sustainability pillars noted below and referenced in the [Sustainable Pest Management \(SPM\) Roadmap](#):
 - Human Health and Social Equity,
 - Environmental Protections,
 - Economic Vitality

Please note that definitions for the terms *underserved communities*; *disadvantaged communities*; and *pesticides of high regulatory interest* are provided in the “Definitions for Priority Topic Areas” section of the 2025 Research Grants Solicitation.

To view previously awarded DPR Research Grants, please use this link to view our [funded projects](#).

7. How many projects are expected to be funded?

Project budgets may range from \$50,000 to \$500,000.

The number of proposals funded varies according to many factors such as the number of proposals received, the available funding pool, and how Pest Management Advisory Committee and DPR reviewers perceive the project value to Californians.

8. Are cannabis projects allowed?

Yes, we consider all projects that advance IPM knowledge in agricultural, urban, and wildland settings, including those related to cannabis. Please note that projects which cannot establish a reduction in the usage of a legally applied pesticide are ineligible for funding.

QUESTIONS ABOUT EXPERIMENTAL DESIGN & STATISTICAL ANALYSES

9. What types of statistical analyses are appropriate?

Accepted experimental design and statistical methods have changed dramatically over the last two decades and it is no longer acceptable practice to simply state “the experimental design is a randomized complete blocks design and the data will be analyzed using ANOVA methods.”

Generalized linear models and generalized linear mixed models are now the accepted statistical methods for most experiments. See “Analysis of Generalized Linear Mixed Models in the Agricultural and Natural Resources Sciences” (2012) by Gbur et. al. You are strongly urged to seek the advice of a consulting statistician at the very beginning stages of developing your application to assist you in producing an appropriate experimental design and effective statistical methods. This will help you more accurately develop your budget and staffing requirements and will help ensure that your project produces information that can support the implementation of its findings.

QUESTIONS RELATING TO FEDERAL OR TRIBAL ENTITIES

10. My institution is a tribal or federal agency and cannot agree to certain non-UC terms and conditions. What should I do?

Please carefully review the Non-UC Terms and Conditions and contact DPR at IPMGrants@cdpr.ca.gov with any questions or concerns regarding terms and conditions. Additionally, please check the appropriate box in the proposal application form noting that you have contacted DPR regarding this issue prior to submitting your proposal.

11. I’m a federal or tribal agency applicant and must abide by a specific travel policy. What should I do?

Review topic 15 below relating to allowable travel to identify any concerns relative to your travel policy and reach out to DPR staff to discuss specifics prior to submitting a proposal application.

QUESTIONS ABOUT WHAT CAN BE INCLUDED IN A BUDGET

12. Is match funding allowed?

No, the entire set of project objectives, tasks, and deliverables must be completed with funds from the proposed budget. No outside funding is allowed to support project activities. However, please note that in-kind contributions are allowed. Allowed in-kind services include personnel time given to project

by team members, the use of team members' existing equipment or facilities, and donations of materials by team members.

13. Can I pay for work conducted outside my organization?

Yes, either through other direct cost (ODC) or subcontract/subaward mechanisms. For further information, please review FAQs 16 and 31 below as well as the terms and conditions ([UC/CSU Applicants – Exhibits C and G](#), [Non-UC/CSU Applicants – Exhibit C](#)).

14. What purchases qualify as equipment?

Equipment is defined as having a useful life of at least one year, having an acquisition unit cost of at least \$5,000, and purchased with grant funds. Equipment is also defined as any products, objects, machinery, apparatus, implements, or tools purchased, used, or constructed within the grant, including those products, objects, machinery, apparatus, implements, or tools from which over thirty percent (30%) of the equipment is composed of materials purchased for the grant.

15. What travel is allowable?

Only travel within the state of California is allowable. Travel costs associated with visits to sites outside of California, including scientific conference locations, are not allowed. Additionally, any travel originating or ending out of the state is not allowed.

Any travel must be included in the approved budget.

For non-UC applicants, travel and reimbursement for travel costs shall be in accordance with the California Department of Human Resources' (CalHR) travel policy in effect as of July 1 of the fiscal year in which the grant agreement is executed. The CalHR travel policy is found at:

<https://www.calhr.ca.gov/employees/pages/travel-reimbursements.aspx>.

Travel and reimbursement for university employee travel costs shall be in accordance with the university's travel policy in effect as of the date the cost is incurred. The travel policies for UC and CSU applicants are found at:

- [UC] <https://www.ucop.edu/central-travel-management/resources/index.html>
- [CSU] <https://calstate.policystat.com/policy/14626378/latest>

16. When should I categorize costs under the Materials and Supplies budget category rather than the Other Direct Costs budget category?

Costs listed under the Materials and Supplies budget category are costs for tangible items purchased for the project, either durable or non-durable in nature, that do not qualify as equipment. Examples include primers for DNA sequencing, flagging materials for field trials, software, and ink and paper for in-house printing.

Costs that do not fall under this definition should be listed under Other Direct Costs (ODC). Examples of ODC are DNA sequencing services, field setup labor costs, printing services, and conference fees.

QUESTIONS ABOUT HOW TO COMPLETE/DEVELOP A BUDGET

17. How do I complete the Budget and Budget Justification?

Complete the budget tables worksheet and any needed subaward budget tables worksheets found on the [Research Grants Application Materials](#) webpage. These spreadsheets will calculate the numbers needed to fill out the budget and budget justification sections of the proposal application. Note: These numbers *must* match between the two documents.

You may have institutional resources available for these sections – grant offices or other administrative divisions often are helpful in drafting and revising budgets. See the “Sample Research Grant Scope of Work and Budget” section of this document for an example. The [Alliance Grants Program Supplemental Guidance Document](#) also contains a sample scope of work and budget available for review.

If you have further questions, please reference our “[Budgets and Budget Justifications](#)” informational video.

18. Can I submit my budget and budget justification in another format?

No, the budget tables worksheet and any needed subaward budget tables worksheets, budgets, and budget justifications must all be submitted using the provided formats.

19. Can I use my organization’s internal software to calculate budgetary numbers?

Yes, any software may be used to prepare the budget calculations, as long as the values are transferred to the document provided in the application materials. Note that DPR manually reconciles amounts listed in the budget using the values provided in the budget justification and budget tables worksheet (and any needed subaward budget tables worksheets). It is the applicant's responsibility to ensure that all values, including those obtained via internal software, can be reconciled manually using the values provided in the budget justification and budget tables worksheet (and any needed subaward budget tables worksheets). Applicants may choose to include a copy of their budget software’s outputs as an optional attachment; however, such materials cannot be used in lieu of the provided application materials.

20. Rather than providing specific numbers for personnel salaries, can I provide these salaries as ranges?

No, we require that applications provide salaries as specific numbers. General ranges are not adequate.

21. How do I specify in-kind contributions in the budget justification?

In-kind contributions should be specified in the applicable sections of the budget justification. For example, if the in-kind contribution is time and service of an individual, that should be stated in the personnel section. If the in-kind contribution is equipment or materials and supplies, it should be stated in the relevant section. It is not necessary to include in-kind contributions in the budget tables worksheet and subaward budget tables worksheets.

22. What is the MTDC?

The MTDC is the modified total direct cost that is used to calculate the indirect costs associated with the grant.

23. How do I calculate the MTDC?

The MTDC is calculated for each year by totaling all the direct costs that are allowed to have associated indirect costs. The MTDC includes all salaries and wages, fringe benefits, materials, supplies, services, travel, consultants, and subcontracts (up to the first \$25,000 of each subcontract).

24. Which direct costs cannot be included in the MTDC calculation?

Certain direct costs are not allowed to have associated indirect costs and must not be included when calculating the indirect cost for the grant. These costs include costs associated with equipment, capital expenditures, patient care charges, tuition remission, rental costs, scholarships and fellowships, and the portion of any subcontract in excess of \$25,000 cannot be included in the MTDC calculation.

25. What is the indirect cost rate?

This rate is the percentage of the MTDC that can be claimed as indirect costs. DPR limits the indirect costs rate to a maximum rate of 25%. Please use a single, percentage-based calculation for indirect cost rates.

26. How are indirect costs calculated for budgets involving multiple UC campuses or multiple CSU campuses?

In these cases, indirect costs are not calculated for individual subrecipients. Instead, the MTDC of each subrecipient is added to the main MTDC to calculate indirect costs.

For example, if the grantee for a grant is the Regents of the University of California, and there are other UC campuses and/or UCANR listed as subcontractors or subrecipients, only the campus associated with the principal investigator may charge overhead on the costs attributed to the other campuses and/or UCANR. In other words, all relevant UC costs must be combined into a single amount (in the main budget table) and the indirect cost rate of 25% must be calculated on that combined amount. Indirect costs for budgets involving multiple UC campuses and/or UCANR should be denoted as 0% in each UC campuses and/or UCANR subaward table.

The Regents of the University of California is responsible for internally allocating the overhead among the various subrecipients. Applicants should refer to their UC or CSU institution to determine how indirect costs for subrecipients/subawardees are allocated, as this should be in accordance with UC or CSU policies. However, an indirect cost rate of 25% may still be charged on non-UC/UCANR subcontracts up to the \$25,000 cap.

27. Are costs related to administration or facilities, such as salaries and fringe benefits for administrative staff, allowable in the budget?

Yes, these costs are allowable – with some caveats. Typically, these costs are considered to be indirect costs (IDC), also known as “overhead” or “facilities and administrative costs.” In most situations, these costs should not be included as direct costs. Examples of costs that are typically included in IDC include facilities operation, office space rentals and leases, administrative expenses (such as staffing for payroll, human resources, or other general support; office supplies and furniture; and phone and internet access), and utilities. Recall that indirect costs may not exceed 25% of the modified total direct cost (MTDC). Please see FAQs 22-24 above for more information regarding the MTDC.

Rarely, costs typically considered to be IDC may be included in proposal budgets as direct costs if they can be considered specific to the project. DPR will consider these inclusions on a case-by-case basis. In

these cases, where costs typically considered to be IDC are instead charged as direct costs, supporting documentation that demonstrates that the costs are specific to the project may be requested before invoices are approved.

QUESTIONS ABOUT SUBCONTRACTS/SUBAWARDS/SUBRECIPIENTS

28. Can subcontracts or subrecipients be outside of the state of California?

Yes. Subcontracts and subrecipients may be outside of California. As a reminder, proposals are assessed based on their benefit to Californians.

29. What is the difference between a subcontractor and a subrecipient?

A subcontractor is an independent entity that will be collaborating with or providing a service to the applicant to complete the objectives of the grant. Note that to receive grant funds as personnel, staff must be paid through the same organization as the principal investigator. If staff cannot receive funds through the principal investigator's organization, they must instead be listed as subcontractors.

Subrecipients are a specific classification of subcontractor that applies to UC/CSU applicants only. Applicants should refer to their UC or CSU institution for guidance on whether a subcontractor meets the criteria of a subrecipient.

30. If my project includes multiple subcontractors/subrecipients, should they each have their own line in the budget table?

Yes. For each subcontractor, the total costs per year (combined direct and indirect costs) should be entered on the respective line in the budget justification and budget tables worksheet.

31. When is it appropriate to categorize costs as a subcontractor rather than listing these costs in Other Direct Costs?

When the provided services are specialized and contribute substantially to project deliverables, the service provider should be classified as a subcontractor. Alternatively, if the services are not necessarily specialized and can be completed by multiple possible entities, it is more appropriate to classify these costs under the Other Direct Costs (ODC) budget category.

32. Do subcontractors and subrecipients need their own budget table and budget justification?

Yes, each subcontractor and/or subrecipient will need to complete a subaward budget tables worksheet and budget justification.

33. How are subcontractors incorporated into the MTDC calculated in the main budget?

There is a \$25,000 total maximum limit allowed for each subcontract over the term of the grant that can be factored into the MTDC of the main budget.

For example, consider a budget with one subcontractor whose total costs per year are \$15,000 in year 1, \$12,000 in year 2, and \$7,500 in year 3. In year 1, the \$15,000 can be factored into the year 1 main budget MTDC. In year 2, \$10,000 can be factored into the year 2 main budget MTDC. The \$25,000 maximum limit for this subcontractor has been reached in year 2, so the remaining year 2 cost of \$2,000 cannot be included in the year 2 main budget MTDC and the year 3 cost of \$7,500 cannot be

included in the year 3 main budget MTDC. Instead, these costs over the \$25,000 limit are direct costs not subject to indirect costs.

See the table below showing how this should be shown.

Direct Cost Type	Year 1	Year 2	Year 3	Total
Subcontractor total direct costs	\$15,000	\$12,000	\$7,500	\$34,500
Direct costs that can be factored into the main budget MTDC	\$15,000	\$10,000	\$0	\$25,000
Direct costs that cannot be factored into the main budget MTDC	\$0	\$2,000	\$7,500	\$9,500

34. How are indirect costs calculated for subcontractors?

Indirect costs for subcontractors are calculated the same as in the main budget.

SAMPLE RESEARCH GRANT SCOPE OF WORK AND BUDGET

To assist you in developing your proposal application, DPR has developed a **fictional** sample scope of work and budget for the Research Grants Program. Please note that this sample is ONLY intended to provide a comprehensive example of a properly completed and formatted Section 3. All names are invented for this example and any similarity to an actual individual is coincidental.

This **fictional**, yet illustrative, sample is not intended to describe DPR's preferred grant topics or budget sizes for this 2025 Research Grant Solicitation, nor is it intended to limit creativity. For examples of the variety of research grants DPR funds, please visit our [funded projects webpage](#). For questions regarding the sample scope of work and budget, please contact IPMGrants@cdpr.ca.gov.

For an additional example of a completed scope of work and budget document specific to the Alliance Grants Program, see the [2025 Alliance Grants Guidance Document](#). Please note that while these documents bear many useful similarities, some sections of each scope of work are specific to the Research and Alliance Grants Programs.

SECTION 3: SCOPE OF WORK AND BUDGET

(20 Percent Weight)

Project Abstract:

Provide a succinct (600 characters maximum) and accurate abstract of the project, including the project purpose, priorities, scope, and grant beneficiaries. Beneficiaries include any communities, persons, or entities that benefit from this funding. This summary should be in clear language and understandable to technical and non-technical readers.

Imidacloprid-based control of glassy-winged sharpshooters, that vector the causal agent of Pierce's disease, is becoming inconsistent due to increasing insecticide resistance. Additionally, imidacloprid has been implicated in pollinator concerns. In alignment with DPR's mission of protecting human health and the environment, and in support of California's efforts to transition to safer, more sustainable pest management, this project seeks to test and develop biocontrol methods to control Pierce's disease in vineyards. These alternatives would benefit the California wine and table grape industries along with the Californians living in grape-growing areas.

Project Summary:

Provide a succinct (one page maximum) and accurate description of the project. The summary should include the experimental design (controlled or observational), methods (statistical, modeling, and other), and any software that will be employed. Additionally, the summary should address the relevance of the project to the mission of the department.

Xylella fastidiosa causes Pierce's disease in grapevine and is problematic in vineyards near citrus

Sample Scope of Work and Budget

groves because *X. fastidiosa* is vectored by glassy-winged sharpshooters (*Homalodisca vitripennis*) that feed in vineyards and reproduce in citrus groves. Current imidacloprid treatments to control glassy-winged sharpshooter populations yield mixed results because coordinated pesticide applications between vineyards and citrus groves are not always consistent and glassy-winged sharpshooters have started developing resistance. Furthermore, options to treat *X. fastidiosa* directly in infected vines do not currently exist. Therefore, this project seeks to develop a two-pronged approach for managing Pierce's disease in vineyards by controlling *X. fastidiosa* populations within grapevines and glassy-winged sharpshooter populations in nearby citrus groves.

The first objective will focus on using naturally derived antimicrobial compounds and antagonistic bacterial endophytes to control *X. fastidiosa* in grapevines. Our lab already has potential candidates from *in vitro* studies that are ready for greenhouse and field trials. In controlled greenhouse experiments, the antimicrobial compounds will be sprayed onto leaves of *X. fastidiosa*-infected grapevines, and the endophytes will colonize healthy grapevines via root uptake before introducing *X. fastidiosa* via inoculation. A larger controlled field experiment will also be conducted using grapevine microplots that are naturally infested with *X. fastidiosa*. Grapevines will be treated with either foliar-sprayed antimicrobial compounds or with soil drenches of endophytes. In all three studies, Pierce's disease symptoms and *X. fastidiosa* populations will be assessed and data will be analyzed using a linear mixed effects model to determine the best treatment for controlling *X. fastidiosa* populations in grapevines.

The second objective will focus on controlling glassy-winged sharpshooter populations in citrus groves using parasitoid wasps. Observational studies in citrus groves will be conducted to determine how the presence or absence of understory plantings and soft scale insects contribute to maintaining robust parasitoid wasp populations. These studies will also assess parasitoid wasp coverage after dispersal by hand or by drone in groves and adjacent windbreaks. In each study, glassy-winged sharpshooter populations will also be assessed as an indirect measure of parasitoid wasp population growth and stability. Data generated will be analyzed using linear mixed effects models, and the best parasitoid wasp dispersal and population maintenance methods will be determined.

The third objective will combine the best prophylactic treatment for controlling *X. fastidiosa* in grapevines and the best parasitoid wasp dispersal and population maintenance methods in a large-scale experiment that will take place in three different locations in the Central Valley. Each location will have four field sites that consist of a vineyard and an adjacent citrus grove with natural *X. fastidiosa* and glassy-winged sharpshooter populations. Data for *X. fastidiosa* population size, Pierce's disease symptoms and spread, glassy-winged sharpshooter populations in citrus groves and vineyards, and parasitoid wasp populations in the citrus groves will be collected and analyzed using a linear mixed effects model to determine which method works best for controlling both glassy-winged sharpshooter and *X. fastidiosa* populations, ultimately leading to reduced Pierce's disease in vineyards.

The final objective involves conducting a cost-benefit analysis to determine the economic feasibility of using naturally derived antimicrobial compounds or bacterial endophytes as prophylactic treatments

Sample Scope of Work and Budget

and parasitoid wasps to ultimately manage Pierce’s disease in vineyards. Citrus and grape growers will be interviewed to obtain economic information on current control methods along with the cost of grape yield loss. This information will be compared to the cost of the strategies proposed in this research to determine if they are economically viable alternatives. Additionally, this objective will facilitate the dissemination of the results and conclusions of this research through presentations at Citrus and Grape Grower annual meetings and in trade journals.

Research Team Members:

Provide the names, organizations, and role on the project (principal investigator, key personnel, or non- key personnel) for all identified members of the research team. Add additional rows to the table as needed. Succinct definitions of the roles are listed below; for the full descriptions of the roles, please see the relevant terms and conditions for your university or organization.

- *Principal investigator: individual(s) that has the primary responsibility for financial management and control of project funds and is responsible for all aspects of project administration*
- *Key personnel: individuals who contribute to the scientific development or execution of the project in a substantive, measurable way, whether or not salaries are requested*
- *Non-key personnel: individuals that are not specifically required for completion of the scope of work*

Name	Organization	Role on the Project (Principal Investigator, Key Personnel, or Non-Key Personnel)
Mike Rowbes	University of California	Principal Investigator (PI)
Pete Reedisch	University of California	Key Personnel
Anne Alaciss	University of California	Non-Key Personnel
Undergraduate #1 (TBD)	University of California	Non-Key Personnel
Undergraduate #2 (TBD)	University of California	Non-Key Personnel
Akar Radge	UCANR	Key Personnel
Walt Zindafeld	UCANR	Key Personnel
Junior Specialist (TBD)	UCANR	Non-Key Personnel
Ben Effischal	USDA-ARS	Key Personnel
Karen Ferbugges	USDA-ARS	Key Personnel
Ava Aeter	AgAeronauticals Inc.	Non-Key Personnel
Emma McCannick	AgAeronauticals Inc.	Non-Key Personnel

Goals:

Describe the goals of the project in a bullet-point list. List the specific objectives, provide tasks to achieve the objectives, and provide a deliverable and deliverable due date for every task. DPR-required objectives, tasks, and deliverables are included under Objective 1. The grantee is required to provide project-specific objectives, tasks, and deliverables following Objective 1.

Sample Scope of Work and Budget

- Evaluate prophylactic treatments and delivery methods for suppressing *Xylella fastidiosa* in grapevine.
- Optimize conditions for establishing and maintaining parasitoid wasp populations to combat glassy-winged sharpshooters in citrus groves.
- Determine if an integrated pest management (IPM) system incorporating bacterial endophyte prophylactic treatments in vineyards and parasitoid wasp-mediated suppression of glassy-winged sharpshooters in citrus groves synergistically reduce the prevalence and spread of Pierce's disease.

Objective 1: Conduct general grant administration and deliver an outreach plan, required meetings, quarterly and annual progress reports, invoices, and a final report. (Do Not Modify Objective 1 and its associated tasks. These are required for all DPR grants.)

Task 1.1 Initial project meeting: The grant manager and the principal investigator will meet in person or virtually within 14 days after the grant agreement has been executed. The grant manager will provide an agenda for the meeting at least one week in advance of the meeting, which will include, at minimum, the following topics: the role of the principal investigator, the project timeline (including a schedule of project quarterly update meetings), the project deliverables, and time to discuss any questions about the objectives and tasks. The principal investigator may submit any requested additions to the agenda. The grant manager will write up meeting minutes and a schedule of project quarterly update meetings and share with all attendees after the meeting.

Deliverable: Meeting minutes as a Microsoft Word file, including any revisions, within 14 days of receiving the meeting minutes from the grant manager.

Due Date: Meeting within 14 days from the full execution of the grant agreement and meeting minute revisions within 14 days of receiving meeting minutes.

Task 1.2 Research plan: Provide a research plan using the provided template for each of the experiments or studies. Include detailed reasoning and descriptions of experimental approaches. The department's review and approval will be limited to ensuring the research plan contains sufficient detail to enable DPR's understanding of the proposed experimental designs for each of the experiments or studies associated with the grant. Note that any changes to the research plan during the life of the grant require an updated research plan submission.

Deliverables: The research plan as a Microsoft Word file using the provided template.

Due Date: Within 30 days after the grant agreement is executed.

Task 1.3 Economic analysis: Collect data on economic costs associated with implementing the pest management practice(s) and/or IPM system(s) developed through the grant. Conduct an economic analysis focused on determining the actual economic benefits and feasibility of adopting the pest management practice(s) and/or IPM system(s) developed. The economic analysis should draw comparisons to current standard pest management practices. Submit this economic analysis as part of the final report draft (Task 1.8).

Deliverables: The economic analysis incorporated into the final report draft and inclusive of written explanations, tables, figures, or images needed to fully convey the plan.

Due Date: June 15, 2028.

Task 1.4 Invoices: Periodic invoices, a final invoice, and an invoice for the return of the ten percent retention are required. No funds may be requested or invoiced after 90 days from the project completion date. To meet that deadline, all project work and required deliverables, including the final report, must be completed and delivered to the department by June 30, 2028.

Deliverables: Periodic, final, and ten percent retention invoices. At a minimum, quarterly invoices are required even if no expenses were incurred and, in that case, would indicate zero (\$0) expense. All invoices must use the template forms supplied by the department and include backup documentation to support the expenditures.

Due Date: Periodic invoices must be submitted no more than once a month and no less than quarterly (every three months). The final invoice is due September 14, 2028, and the ten percent retention invoice is due September 28, 2028.

Task 1.5 Project quarterly update meetings: Beginning after the first full quarter, project update meetings will occur by one month after the last day of every calendar quarter, in person or virtually, as scheduled during the Task 1.2 initial project meeting or subsequently revised by mutual agreement of the grant manager and principal investigator.

The grant manager will provide an agenda at least one week in advance of the meeting. The principal investigator may submit any requested additions to the agenda. Any key personnel needed to explain project results, problems, and special situations that are explicitly related to project deliverables must attend. If requested by the grant manager, meetings should occasionally include representation by the intended end-users of the project results. The grant manager may require additional meetings as needed. The grant manager will provide meeting minutes for review and approval after each meeting.

Deliverable: Meeting minutes as a Microsoft Word file, including any revisions, within 14 days of receiving the meeting minutes from the grant manager.

Due Date: Meeting within one month after the end of every calendar quarter through April 30, 2028, and meeting minute revisions within 14 days of receiving meeting minutes.

Task 1.6 Quarterly progress reports: Quarterly reports must contain the information required on the template. Quarterly report should include relevant results, problems, and special situations that are explicitly related to project deliverables and any potential or actual effects on the deliverables or their completion dates. Submit quarterly reports to grant manager.

Deliverables: Quarterly reports (using template forms supplied by the department).

Due Date: The end of every calendar quarter through March 31, 2028.

Task 1.7 Annual reports: The annual reports must contain the information required on the template. The annual report should include relevant results, problems, and special situations that are explicitly related to project deliverables and any potential or actual effects on the deliverables or their completion dates. Additionally, the annual report must include a project work plan for the coming year and any expected modifications from what was originally

Sample Scope of Work and Budget

proposed in the grant agreement and/or the applicable research plan. Submit annual reports to grant manager.

Deliverables: Annual reports completed using the template due June 30 of each year (except for the year the final report is due) following grant execution as a Microsoft Word file via email.

Due Date: Every June 30 through June 2027.

Task 1.8 Final report draft: Use the final report template to describe in detail how project goals and objectives have been fulfilled through the completion of project deliverables, summarize and evaluate project activities and accomplishments, and include recommendations for outreach and/or future research. Grantees should strive to make the report compliant with standards set forth in the [Americans with Disabilities Act Web Content Accessibility Guidelines 2.0](#). The report must focus on how project results are explicitly related to project deliverables and must clearly describe any potential or actual effects on the deliverables. Also, include all relevant materials, documentation, and deliverables not previously submitted. Submit draft report to the grant manager.

Deliverable: Final report draft as a Microsoft Word file via email (security settings should be unlocked, not password protected).

Due Date: June 15, 2028.

Task 1.9 Final report: Final report, incorporating any feedback, edits, or revisions to the draft final report. Grantees should strive to make the report compliant with standards set forth in the [Americans with Disabilities Act Web Content Accessibility Guidelines 2.0](#). Submit the final report to grant manager. Final reports may be published on DPR's website for review by the public.

Deliverable: Final report as a Microsoft Word file and high-resolution files (jpeg, png, tiff, etc.) of all photos, figures, and illustrations included in the final report via email (security settings should be unlocked, not password protected).

Due Date: June 30, 2028.

Task 1.10 Department presentation: The principal investigator or other key personnel will make a summary presentation, in person in the greater Sacramento area or virtually, during the last year of the project or the year after the project is completed. Grantees should strive to make the presentation compliant with standards set forth in the [Americans with Disabilities Act Web Content Accessibility Guidelines 2.0](#). The presentation will provide information about project goals, objectives, and results. DPR retains the right to publish the presentation on DPR's website for review by the public.

Deliverables: Presentation with an electronic copy of the presentation provided to the grant manager via email at least three weeks in advance.

Due Date: Last year of the project or the year after the project is completed.

Objective 2: Identify the most effective prophylactic treatment and delivery method for suppression of *Xylella fastidiosa* in grapevine.

Task 2.1 Greenhouse study to assess the effects of three different foliar-sprayed antimicrobial compounds on *Xylella fastidiosa* in grapevine: Three-month-old grapevines grown in 1-gallon

Sample Scope of Work and Budget

pots will be inoculated with *Xylella fastidiosa* using the needle prick method, and populations will be allowed to grow for one month. After the one-month incubation period, three compounds that have been shown to reduce *Xylella fastidiosa* populations in laboratory settings will be each be combined with a surfactant and applied to the foliar tissue using a backpack sprayer. Grapevines sprayed with water + surfactant will serve as a positive control. Grapevines will be arranged using a random block design and Pierce's disease symptoms will be quantitatively measured by determining the percentage of leaves that have scorching symptoms. Tissue samples will be collected once a month for six months, and *Xylella fastidiosa* will be extracted and quantified using quantitative Real-Time PCR (qRT-PCR). Both Pierce's disease symptom data and *Xylella fastidiosa* population data will be analyzed using a linear mixed effects model where treatment, time, and the interactions therein are fixed factors and individual grapevine is the random effect.

Deliverable: Report detailing results along with tables, figures, images, and statistical analyses as needed to support the findings.

Due Date: January 31, 2026.

Task 2.2 Greenhouse study to assess the effects of soil-introduced xylem colonizing endophytes that secrete antimicrobial compounds on *Xylella fastidiosa* in grapevine:

Three-month-old grapevines grown in 1-gallon pots will be inoculated with *Xylella fastidiosa* using the needle prick method, and populations will be allowed to grow for one month. After the one-month incubation period, solutions of three different endophytic bacteria will be poured into the soil and allowed to colonize the grapevines for one month. Grapevines with soil receiving water only will serve as the positive control. Grapevines will be arranged using a random block design and Pierce's disease symptoms will be quantitatively measured by determining the percentage of leaves that have scorching symptoms. Tissue samples will be collected once a month for six months, and *Xylella fastidiosa* will be extracted and quantified using qRT-PCR. Both Pierce's disease symptom data and *Xylella fastidiosa* population data will be analyzed using a linear mixed effects model where treatment, time, and the interactions therein are fixed factors and individual grapevine is the random effect.

Deliverable: Report detailing results along with tables, figures, images, and statistical analyses as needed to support the findings.

Due Date: January 31, 2026.

Task 2.3 Field study to assess the effects of foliar-sprayed antimicrobial compounds and soil-introduced xylem colonizing endophytes on *Xylella fastidiosa* in naturally infected field grapevines:

The field for this study will use 840 two-year old grapevines that have been growing in isolated microplots in an area with natural Pierce's disease pressure. Each microplot contains 12 grapevines and is surrounded by a plastic barrier that was buried six feet deep, with 25 feet separation between microplots. Using a randomized block design, 10 microplots will each receive one of the six treatments used in the previous greenhouse studies. The last set of 10 microplots will not receive any treatment and will serve as the positive control. For a total of seven different 10 microplot treatments. Prior to treatment, all grapevines will be assessed for initial Pierce's disease symptoms, and samples from five random grapevines per microplot will be used to assess initial *Xylella fastidiosa* population size, using the same methods as described in Objective 2. Following treatment, Pierce's disease symptoms and *Xylella fastidiosa* populations will be assessed once a month for three months in the same manner. Both Pierce's disease symptoms

Sample Scope of Work and Budget

and *Xylella fastidiosa* population size will be averaged per microplot. Both Pierce's disease symptom data and *Xylella fastidiosa* population data will be analyzed using a linear mixed effects model where treatment, time, and the interactions therein are fixed factors and individual microplot is the random effect.

Deliverable: Report detailing results along with tables, figures, images, and statistical analyses as needed to support the findings.

Due Date: January 31, 2027.

Objective 3: Optimization of parasitoid wasp releases and conditions for population establishment to combat glassy-winged sharpshooters in citrus groves.

Task 3.1 Assess the effects of understory plantings and soft scale on parasitoid wasp and glassy-winged sharpshooter populations in citrus plots: Established citrus plots at a central valley agricultural station with natural glassy-winged sharpshooter and softscale presence will be used for this study. Three plots, each consisting of 30 trees, will have one of the following treatments:

- 1) understory planted with Alyssum and Buckwheat and a natural softscale population,
- 2) understory planted with Alyssum and Buckwheat and sprayed with pesticide to remove softscale,
- 3) no understory and a natural softscale population, and
- 4) no understory and sprayed with pesticide to remove softscale.

Plots will be randomized, and parasitoid wasps will be released by hand in each plot. Both parasitoid and glassy-winged sharpshooter populations will be assessed twice per month from April through September. Data will be analyzed using a linear mixed effects model with parasitoid population size as the response variable, treatment, time, and the interactions therein as the fixed variables, and plot number as the random effect to determine if understory plantings and presence of softscale positively affect the parasitoid wasp population. Additionally, a linear mixed effects model with glassy winged sharpshooter population as the response variable, parasitoid wasp population size, time, and the interactions therein as the fixed variables, and plot number as the random effect will be used to determine if glassy-winged sharpshooter populations are negatively affected by parasitoid wasp populations.

Deliverable: Report detailing results along with tables, figures, images, and statistical analyses as needed to support the findings.

Due Date: November 30, 2026.

Task 3.2 Assess parasitoid wasp and glassy-winged sharpshooter populations in citrus groves and adjacent windbreaks after hand release and drone release: Five growers, each with two large groves with windbreaks and natural glassy-winged sharpshooter populations, will be used for this study. For each site, one grove and the associated windbreaks will receive parasitoid wasp populations dispersed by hand, while the other field and associated windbreaks will receive parasitoid wasps dispersed by drone. Dispersals will occur once at the center of the windbreak and once at the center of the grove in both March and June to coincide with predicted glassy-winged sharpshooter rearing cycles. Parasitoid wasp populations and percentage of grove with established populations will be assessed twice per month from March through September. Data will be analyzed using linear mixed effects models where the fixed factors of dispersal type, time, and the interactions therein and the random effect of grove will inform the response variables of parasitoid wasp total population or percentage of grove with established parasitoid wasp

populations.

Deliverable: Report detailing results along with tables, figures, images, and statistical analyses as needed to support the findings.

Due Date: November 30, 2026.

Objective 4: Determine if prophylactic treatments in grapevine and suppression of glassy-winged sharpshooters by parasitoid wasps in citrus groves have a synergistic effect on the prevalence and spread of Pierce's disease.

Task 4.1 Assess glassy-winged sharpshooter populations in citrus groves and adjacent vineyards and Pierce's disease incidence and spread after simultaneous parasitoid wasp releases and grapevine treatment:

This study will be conducted on a large scale, encompassing four field sites in each of three separate locations. Each field site will be a citrus orchard adjacent to a vineyard (both naturally infested by glassy-winged sharpshooter), and the four field sites per region will reside within a five-mile radius. Field sites within a region will have one of the following treatments:

- 1) the best prophylactic treatment from Objective 2 and the best dispersal and population maintenance methods from Objective 3,
- 2) the best prophylactic treatment from Objective 2 only,
- 3) the best dispersal and population maintenance methods from Objective 3, or
- 4) Neither treatment (control site).

Parasitoid wasp releases will occur in both March and June to coincide with predicted glassy-winged sharpshooter rearing cycles. The prophylactic treatments will occur once per month. Initial glassy-winged sharpshooter populations and Pierce's disease symptoms will be assessed prior to treatment. Samples and data will be collected twice per month from March through September and will include grapevine tissue samples for *Xylella fastidiosa* extraction and quantified via qRT-PCR, Pierce's disease symptoms and spread, glassy-winged sharpshooter populations in the citrus groves and vineyards, and parasitoid wasp populations in the citrus groves. Data will be analyzed using a linear mixed effects model where the fixed effects are *Xylella fastidiosa* population size, glassy-winged sharpshooter population size in the vineyard, parasitoid wasp population size, time, and all the interactions therein, the random effect is field site, and the response variables are overall Pierce's disease symptoms and percentage of vineyard with Pierce's disease symptoms.

Deliverable: Report detailing results along with tables, figures, images, and statistical analyses as needed to support the findings.

Due Date: January 31, 2028.

Objective 5: Assess economic feasibility and extend project results to stakeholders.

Task 5.1 Conduct a cost-benefit analysis to compare the economic feasibility of using microbe-associated prophylactic treatments and parasitoid wasps to manage Pierce's disease in vineyards with current control methods:

Growers of the citrus orchards and vineyards used in the previous objectives of this project will be interviewed to determine the costs associated with the chemical treatments they currently use for controlling glassy-winged sharpshooter and Pierce's disease.

Costs associated with grape yield loss will also be determined. The cost-benefit analysis and all associated data will be published on a grape pest management webpage.

Deliverable: Report detailing the results and conclusions of the cost benefit analysis

Sample Scope of Work and Budget

along with tables, figures, images, and statistical analyses as needed to support the findings. Final draft of the proposed additions to the grape pest management website will be provided 20 business days prior to publishing.

Due Date: April 30, 2028.

Task 5.2 Outreach: Present most recent results at Citrus and Grape Grower annual meetings.

Deliverable: Submission of presentation materials 20 business days prior to each meeting.

Due Date: April 30, 2027; April 30, 2028.

Task 5.3 Publish results of the project in trade journals.

Deliverable: Final drafts of articles to be published in trade journals will be submitted 20 business days prior to publishing date.

Due Date: June 30, 2028.

Schedule of Deliverables

List all items that will be delivered to the State under the proposed Scope of Work. Include all reports, including draft reports for State review, and any other Deliverables, if requested by the State and agreed to by the Parties.

If use of any Deliverable is restricted or is anticipated to contain preexisting Intellectual Property with any restricted use, it must be clearly identified.

Unless otherwise directed by the State, the Principal Investigator shall submit all Deliverables to the Grant Manager.

Objective	Task and Deliverable	Due Date
1	1.1 Initial project meeting	14 days from grant execution
1	1.2 Research plan	30 days from grant execution
1	1.3 Economic analysis	June 15, 2028
1	1.4 Invoices	Frequency: maximum monthly and minimum quarterly. Final invoice due September 14, 2028. 10% retention invoice due September 28, 2028.
1	1.5 Quarterly project update meetings	Every quarter through April 30, 2028
1	1.6 Quarterly project reports	Every quarter through March 31, 2028
1	1.7 Annual reports	Every June 30 through 2027
1	1.8 Draft final report	June 15, 2028
1	1.9 Final report	June 30, 2028
1	1.10 DPR presentation	Final year of project or following year
2	2.1 Report detailing results along with tables, figures, images, and statistical analyses as needed to support the findings.	January 31, 2026
2	2.2 Report detailing results along with tables, figures, images, and statistical analyses as needed to support the findings.	January 31, 2026
2	2.3 Report detailing results along with tables, figures, images, and statistical analyses as needed to support the findings.	January 31, 2027
3	3.1 Report detailing results along with tables, figures, images, and statistical analyses as needed to support the findings.	November 30, 2026
3	3.2 Report detailing results along with tables, figures, images, and statistical analyses as needed to support the findings.	November 30, 2026

Sample Scope of Work and Budget

4	4.1 Report detailing results along with tables, figures, images, and statistical analyses as needed to support the findings.	January 31, 2028
5	5.1 Report detailing the results and conclusions of the cost benefit analysis along with tables, figures, images, and statistical analyses as needed to support the findings. Final draft of the proposed additions to the UC IPM website will be provided 20 business days prior to publishing.	April 30, 2028
5	5.2 Submission of presentation materials 20 business days prior to each meeting.	April 30, 2027; April 30, 2028
5	5.3 Final drafts of articles to be published in trade journals will be submitted 20 business days prior to publishing date.	June 30, 2028
The following Deliverables are subject to Copyrights, See Terms and Conditions.		

Principal Investigator: Mike Rowbes

Organization: University of California

COMPOSITE BUDGET FOR ENTIRE PROPOSED PROJECT PERIOD: 07/01/2025 to 6/30/2028

BUDGET CATEGORY	Year 1 7/1/2025 – 6/30/2026	Year 2 7/1/2026 – 6/30/2027	Year 3 7/1/2027 – 06/30/2028	TOTAL
PERSONNEL: <i>Salary and fringe benefits.</i>	\$41,644	\$42,893	\$44,180	\$128,717
TRAVEL	\$0	\$3,848	\$4,106	\$7,954
MATERIALS & SUPPLIES	\$2,950	\$4,740	\$15,645	\$23,335
EQUIPMENT	\$45,500	\$0	\$0	\$45,500
RENT	\$5,000	\$0	\$0	\$5,000
SUBRECIPIENT #1 - UCANR (UC/CSU applicants only, IDC not allowed)	\$0	\$47,965	\$53,666	\$101,631
SUBCONTRACTOR #1 – USDA-ARS (IDC allowed up to 25% on first \$25,000)	\$0	\$33,955	\$35,451	\$69,406
SUBCONTRACTOR #2 – AgAeronauticals Inc. (IDC allowed up to 25% on first \$25,000)	\$0	\$10,616	\$20,631	\$31,247
OTHER DIRECT COST #1: Tuition and Fees Subject to IDC: N	\$10,233	\$10,545	\$11,087	\$31,865
OTHER DIRECT COST #2: Subject to IDC: Y/N	\$0	\$0	\$0	\$0
TOTAL DIRECT COSTS	\$105,327	\$154,562	\$184,766	\$444,655
MODIFIED TOTAL DIRECT COSTS (F&A Base)	\$49,594	\$87,097	\$78,315	\$215,006
INDIRECT (F&A) COSTS Rate: 25%	\$12,399	\$21,774	\$19,579	\$53,752
TOTAL COSTS PER YEAR	\$117,726	\$176,336	\$204,345	
TOTAL COSTS FOR THE PROJECT PERIOD				\$498,407

* MTDC = Modified Total Direct Cost

JUSTIFICATION: Follow the budget justification instructions.

Budget Flexibility: Prior approval is required for all budget changes.

Principal Investigator: Mike Rowbes

Organization: University of California

Budget Justification

The budget justification will include the following items in this format. Identify and report in-kind contributions of personnel time, equipment, facilities, and materials by team members.

Complete a separate budget justification (see below) for each subrecipient (UC/CSU applicants only) or subcontractor.

For all applicable items reported in this budget justification section, the corresponding sheet in the budget tables worksheet (Microsoft Excel) must be completed in full. Numbers contained in the budget tables worksheet must match the numbers reported in this budget justification section.

PERSONNEL

Name. *Starting with the principal investigator, list the names of all known personnel who will be involved on the project for each year of the proposed project period. Include all collaborating investigators, individuals in training, technical and support staff and include as “to-be-determined” (TBD).*

Mike Rowbes, PI

Pete Reedisch

Anne Alaciss

Undergraduate #1 (TBD)

Undergraduate #2 (TBD)

Role on Project. *For each personnel listed by name, including “to-be-determined” (TBD) positions, list their role on the project. Add additional lines as needed.*

Mike Rowbes, Assistant Professor in Plant Pathology, University of California, 3% effort *in-kind*, no salary requested. Will serve as the PI during the entire project period, and will develop experimental designs, coordinate collaboration with subcontractors and subrecipients, and provide academic oversight.

Pete Reedisch, Graduate Student Researcher, University of California, 49% effort. Will conduct all greenhouse experiments, participate in all field experiments, and will be responsible for all sample and data acquisition and management.

Anne Alaciss, Postdoctoral Scholar, University of California, 20% effort. Will conduct all data analysis including statistical modeling and interpretation of results.

Undergraduate Research Assistants #1 and #2 (TBD), University of California, each 25% effort. URAs will participate in greenhouse and lab work and help in sample collection and data acquisition.

Salary. For all personnel, including “to-be-determined” positions, list the salary per year and the total salary. Additionally, note any in-kind salary contributions. Add additional lines as needed.

Mike Rowbes – Year 1 - \$0; in-kind; Year 2 - \$0; in-kind; Year 3 - \$0; in-kind; Total: \$0; in-kind
Pete Reedisch – Year 1 - \$18,130; Year 2 - \$18,674; Year 3 - \$19,234; Total: \$56,038
Anne Alaciss – Year 1 - \$10,000; Year 2 - \$10,300; Year 3 - \$10,609; Total: \$30,909
Undergraduate #1 (TBD) – Year 1 - \$5,750; Year 2 - \$5,923; Year 3 - \$6,100; Total: \$17,773
Undergraduate #2 (TBD) – Year 1 - \$5,750; Year 2 - \$5,923; Year 3 - \$6,100; Total: \$17,773

Fringe Benefits.

For all personnel, including “to-be-determined” positions, list the fringe benefits per year and the total fringe benefits. Add additional lines as needed.

Mike Rowbes – Year 1 - \$0; in-kind; Year 2 - \$0; in-kind; Year 3 - \$0; in-kind; Total: \$0; in-kind
Pete Reedisch – Year 1 - \$290; Year 2 - \$298; Year 3 - \$307; Total: \$897
Anne Alaciss – Year 1 - \$1,540; Year 2 - \$1,586; Year 3 - \$1,634; Total: \$4,760
Undergraduate #1 (TBD) – Year 1 - \$92; Year 2 - \$95; Year 3 - \$98; Total: \$285
Undergraduate #2 (TBD) – Year 1 - \$92; Year 2 - \$95; Year 3 - \$98; Total: \$285

Total Personnel Costs.

Yearly Salary Totals

Year 1 - \$39,630; Year 2 - \$40,819; Year 3 - \$42,043; Total: \$122,492

Yearly Fringe Benefits Totals

Year 1 - \$2,014; Year 2 - \$2,074; Year 3 - \$2,137; Total: \$6,225

Yearly Personnel Totals

Year 1 - \$41,644; Year 2 - \$42,893; Year 3 - \$44,180; Total: \$128,717

TRAVEL (SEE TERMS AND CONDITIONS)

Itemize all travel requests separately by trip and justify, in accordance with university or organizational travel guidelines. Travel and reimbursement for travel for applicants not affiliated with the University of California (UC) or the California State University (CSU) systems shall be in accordance with the [California Department of Human Resources’ \(CalHR\) travel policy](#). For trips that occur over multiple years, include as separate trips. Add additional trips as needed. **No out-of-state travel may be included in the budget.**

TRIP #1

Trip Occurs in: Year 1 Year 2 Year 3

Origin: University of California

Destination: Central Valley

Duration (number of days and number of nights): 3 days, 2 nights

Personnel Names: Mike Rowbes, Pete Reedisch

Purpose: March initial sample and data collection, and participation in the initial drone releases of parasitoid wasps.

Sample Scope of Work and Budget

Total Cost per Trip: \$957
Number of Trip Occurrences: 1
Trip #1 Total: \$957

TRIP #2

Trip Occurs in: Year 1 Year 2 Year 3
Origin: University of California
Destination: Central Valley
Duration (number of days and number of nights): 3 days, 2 nights
Personnel Names: Pete Reedisch
Purpose: June sample and data collection, and participation in drone releases of parasitoid wasps.
Total Cost per Trip: \$575
Number of Trip Occurrences: 1
Trip #2 Total: \$575

TRIP #3

Trip Occurs in: Year 1 Year 2 Year 3
Origin: University of California
Destination: Central Valley
Duration (number of days and number of nights): 1 day, 0 nights
Personnel Names: Pete Reedisch
Purpose: Day trips between March and September to collect samples and data (12 trips per year).
Total Cost per Trip: \$193
Number of Trip Occurrences: 24
Trip #3 Total: \$4,632

TRIP #4

Trip Occurs in: Year 1 Year 2 Year 3
Origin: University of California
Destination: Central Valley
Duration (number of days and number of nights): 5 days, 4 nights
Personnel Names: Pete Reedisch
Purpose: March and June sample and data collection, and participation in drone releases of parasitoid wasps.
Total Cost per Trip: \$895
Number of Trip Occurrences: 2
Trip #3 Total: \$1,790

Total Travel Costs.

Year 1 - \$0; Year 2 - \$3,848; Year 3 - \$4,106; Total: \$7,954

MATERIALS AND SUPPLIES

Itemize all materials and supplies separately by item and include a complete justification of the project's need for these items. Theft sensitive equipment (under \$5,000) must be justified and tracked separately in accordance with State Contracting Manual Section 7.29. Add additional

lines as needed.

Materials and Supplies Justification: Materials and supplies needed to complete all greenhouse and field trials, and perform all of the necessary lab work, including DNA extractions, PCR, qPCR, media preparation, and culturing bacteria. **See detailed list of Materials and Supplies in the Main Budget Excel document.**

Total Materials and Supplies Costs.

Year 1 - \$2,950; Year 2 - \$4,740; Year 3 - \$15,645; Total: \$23,335

EQUIPMENT

List each item of equipment (value greater than or equal to \$5,000 with a useful life of more than one year) with amount requested separately and justify each. List all equipment purchases by year. Add additional lines as needed.

Automated DNA Purifier 2500SL – Year 1 - \$45,500; Year 2 - \$0; Year 3 - \$0; Total: \$45,500

Equipment Justification: The automated DNA purifier will be used for high-throughput DNA extraction prior to PCR for the thousands of field and greenhouse samples that will be collected for this project. This equipment will streamline data collection and ensure the results and analysis can be provided within the grant timeframe. We checked alternatives to purchasing equipment and determined that this kind of equipment cannot be rented due to biosafety risks. However, third-party companies offer DNA extraction and purification as a service, so we assessed the use of these services for this project, but the cost of shipping and processing the number of samples we have would cost 2-3 times as much as purchasing the equipment ourselves. Furthermore, the risk of samples being lost or destroyed in transit could significantly jeopardize the project timeline. We also assessed the cost of performing these DNA extractions manually in our lab but determined this would also be more expensive and take significantly more time to complete relative to purchasing and using this automated equipment.

Total Equipment Costs.

Year 1 - \$45,500; Year 2 - \$0; Year 3 - \$0; Total: \$45,500

RENT

If the Scope of Work will be performed in a facility rented from a third party for a specific project or projects, then rent may be charged as a direct expense to the award. List all facilities rented by year. Add additional lines as needed.

Greenhouse #1 – Glasshouse Growers Inc. – Year 1 - \$2,500; Year 2 - \$0; Year 3 - \$0; Total: \$2,500

Greenhouse #2 – Glasshouse Growers Inc. – Year 1 - \$2,500; Year 2 - \$0; Year 3 - \$0; Total: \$2,500

Rent Justification: Due to a limited number of available campus greenhouses and large space requirements to conduct greenhouse grapevine experiments, the work will be performed at a nearby off-campus greenhouse facility run by Glasshouse Growers Inc. This facility will provide two adequately sized greenhouses that will meet the needs of the project and allow deliverables to be completed. An assessment of on-campus greenhouse space required to complete the relevant tasks

Sample Scope of Work and Budget

indicates six greenhouses would be needed, and the cost to rent the greenhouse space would be \$1,500 per greenhouse. Considering the number of on-campus greenhouses needed, the total cost, and the current lack of availability, renting greenhouse space from Glasshouse Growers Inc. will be cheaper and allow the associated deliverables to be completed on time.

Total Rent Costs.

Year 1 - \$5,000; Year 2 - \$0; Year 3 - \$0; Total: \$5,000

SUBCONTRACTOR

Each subcontractor must submit a separate detailed budget for every year in the project period. Add additional lines as needed. Include a complete Budget Justification for the need for any subcontractor listed in the application.

USDA Agricultural Research Service – Year 1 - \$0; Year 2 - \$33,955; Year 3 - \$35,451; Total: \$69,406
AgAeronauticals Inc. – Year 1 - \$0; Year 2 - \$10,616; Year 3 - \$20,631; Total: \$31,247

SUBRECIPIENT (UC/CSU APPLICANTS ONLY)

Each subrecipient must submit a separate detailed budget for every year in the project period. Add additional lines as needed. Include a complete Budget Justification for the need for any subrecipient listed in the application.

UC Agriculture and Natural Resources – Year 1 - \$0; Year 2 - \$47,965; Year 3 - \$53,666; Total: \$101,631

OTHER DIRECT COSTS (ODC)

Itemize any other expenses by category and include a complete justification of the project's need for these expenses. Specifically include and justify costs that may typically be treated as indirect costs. For example, if insurance, telecommunication, or IT costs are charged as a direct expense, explain reason and methodology. Add additional lines as needed.

Tuition and Fees – Year 1 - \$10,233; Year 2 - \$10,545; Year 3 - \$11,087; Total: \$31,865

Subject to Indirect Costs (IDC): Yes No

Other Direct Costs (ODC) Justification: Tuition and Fees contribute to the compensation package for work conducted by Pete Reedisch as a Graduate Student Researcher to fulfill grant goals.

MODIFIED TOTAL DIRECT COSTS (MTDC) AND INDIRECT (F&A) COSTS (SEE TERMS AND CONDITIONS)

*Indirect costs are calculated on the modified total direct costs (MTDC) in accordance with the budgeted indirect cost rate (Limit 25% maximum). The MTDC includes **up to the first \$25,000 of each subcontract**; the portion of each subcontract in excess of \$25,000 is not included in the MTDC.*

Indirect Cost Rate (%): 25%

Sample Scope of Work and Budget

Modified Total Direct Costs (MTDC) – Year 1 - \$49,594; Year 2 - \$87,097; Year 3 - \$78,315; Total: \$215,006

Total Indirect Costs

Year 1 - \$12,399; Year 2 - \$21,774; Year 3 - \$19,579; Total: \$53,752

Subcontractor/Subrecipient Budgets

(when applicable; submit separate budget and budget justification for each)

Subcontractor/Subrecipient: USDA Agricultural Research Service

Principal Investigator: Mike Rowbes

Organization: University of California

SUBCONTRACTOR/SUBRECIPIENT BUDGET FOR ENTIRE PROPOSED PROJECT PERIOD: 07/01/2025 to 06/30/2028

BUDGET CATEGORY	Year 1 7/1/2025 – 6/30/2026	Year 2 7/1/2026 – 6/30/2027	Year 3 7/1/2027 – 06/30/2028	TOTAL
PERSONNEL: <i>Salary and fringe benefits.</i>	\$0	\$33,655	\$35,001	\$68,656
TRAVEL	\$0	\$0	\$0	\$0
MATERIALS & SUPPLIES	\$0	\$300	\$450	\$750
EQUIPMENT	\$0	\$0	\$0	\$0
RENT	\$0	\$0	\$0	\$0
SUBCONTRACTOR #1 (IDC allowed up to 25% on first \$25,000)	\$0	\$0	\$0	\$0
SUBRECIPIENT #1 (UC/CSU applicants only, IDC not allowed)	\$0	\$0	\$0	\$0
OTHER DIRECT COST #1: Subject to IDC: Y/N	\$0	\$0	\$0	\$0
OTHE DIRECT COST #2: Subject to IDC: Y/N	\$0	\$0	\$0	\$0
TOTAL DIRECT COSTS	\$0	\$33,955	\$35,451	\$69,406
MODIFIED TOTAL DIRECT COSTS (F&A Base)	\$0	\$33,955	\$35,451	\$69,406
INDIRECT (F&A) COSTS Rate: N/A	\$0	\$0	\$0	\$0
TOTAL COSTS PER YEAR	\$0	\$33,955	\$35,451	
TOTAL COSTS FOR THE PROJECT PERIOD				\$69,406

* MTDC = Modified Total Direct Cost

JUSTIFICATION: Follow the budget justification instructions.

Budget Flexibility: Prior approval is required for all budget changes.

Subcontractor/Subrecipient Budget Justification (when applicable)

The budget justification will include the following items in this format. Identify and report in-kind contributions of personnel time, equipment, facilities, and materials by team members. Complete a separate budget justification (see below) for each subrecipient (UC/CSU applicants only) or subcontractor.

For all applicable items reported in this budget justification section, the corresponding sheet in the subaward budget tables worksheet (Microsoft Excel) must be completed in full. Numbers contained in the subaward budget tables worksheet must match the numbers reported in this budget justification section.

PERSONNEL

Name. Starting with the principal investigator, list the names of all known personnel who will be involved on the project for each year of the proposed project period. Include all collaborating investigators, individuals in training, technical and support staff and include any “to-be-determined” (TBD).

Ben Effischal, Co-PI
Karen Ferbugges

Role on Project. For each personnel listed by name, including “to-be-determined” (TBD) positions, list their role on the project. Add additional lines as needed.

Ben Effischal, Research Entomologist, USDA-ARS, 3% effort *in-kind*, no salary requested. Will provide parasitoid wasps from lab-reared colonies, supervise all insect field experiments, assist in project design, and provide technical expertise during sample collection.

Karen Ferbugges, Biological Science Technician, USDA-ARS, 50% effort in Years 2 and 3. Will maintain all lab-reared parasitoid wasp colonies, prepare parasitoid wasps for transport to and release within field sites, and participate in sample collection.

Salary. For all personnel, including “to-be-determined” positions, list the salary per year and the total salary. Additionally, note any *in-kind* salary contributions. Add additional lines as needed.

Ben Effischal – Year 1 - \$0, *in-kind*; Year 2 - \$0, *in-kind*; Year 3 - \$0, *in-kind*; Total: \$0, *in-kind*
Karen Ferbugges – Year 1 - \$0; Year 2 - \$26,500; Year 3 - \$27,560; Total: \$54,060

Fringe Benefits.

For all personnel, including “to-be-determined” positions, list the fringe benefits per year and the total fringe benefits. Add additional lines as needed.

Ben Effischal – Year 1 - \$0, *in-kind*; Year 2 - \$0, *in-kind*; Year 3 - \$0, *in-kind*; Total: \$0, *in-kind*
Karen Ferbugges – Year 1 - \$0; Year 2 - \$7,155; Year 3 - \$7,441 Total: \$14,596

Total Personnel Costs.

Yearly Salary Totals

Year 1 - \$0; Year 2 - \$26,500; Year 3 - \$27,560; Total: \$54,060

Yearly Fringe Benefits Totals

Year 1 - \$0; Year 2 - \$7,155; Year 3 - \$7,441; Total: \$14,596

Yearly Personnel Totals

Year 1 - \$0; Year 2 - \$33,655; Year 3 - \$35,001; Total: \$68,656

TRAVEL (SEE TERMS AND CONDITIONS)

*Itemize all travel requests separately by trip and justify, in accordance with University or Organizational travel guidelines. Travel and reimbursement for travel for applicants not affiliated with the University of California (UC) or the California State University (CSU) systems shall be in accordance with the [California Department of Human Resources' \(CalHR\) travel policy](#). For trips that occur over multiple years, include as separate trips. Add additional trips as needed. **No out-of-state travel may be included in the budget.***

N/A

MATERIALS AND SUPPLIES

Itemize all materials and supplies in separate categories separately by item and include a complete justification of the project's need for these items. Theft sensitive equipment (under \$5,000) must be justified and tracked separately in accordance with State Contracting Manual Section 7.29. Add additional lines as needed.

Collection Vials – Year 1 - \$0; Year 2 - \$300; Year 3 - \$450; Total: \$750

Materials and Supplies Justification: Vials for collecting insect samples during field trials.

Total Materials and Supplies Costs.

Year 1 - \$0; Year 2 - \$300; Year 3 - \$450; Total: \$750

EQUIPMENT

List each item of equipment (value greater than or equal to \$5,000 with a useful life of more than one year) with amount requested separately and justify each. List all equipment purchases by year. Add additional lines as needed.

N/A

RENT

If the Scope of Work will be performed in a facility rented from a third party for a specific project or projects, then rent may be charged as a direct expense to the award. List all facilities rented by year. Add additional lines as needed.

N/A

SUBCONTRACTOR

Each subcontractor must submit a separate detailed budget for every year in the project period. Add additional lines as needed. Include a complete budget justification for the need for any subcontractor listed in the application.

N/A

SUBRECIPIENT (UC/CSU APPLICANTS ONLY)

Each subrecipient must submit a separate detailed budget for every year in the project period. Add additional lines as needed. Include a complete budget justification for the need for any subrecipient listed in the application.

N/A

OTHER DIRECT COSTS (ODC)

Itemize any other expenses by category and include a complete justification of the project's need for these expenses. Specifically include and justify costs that may typically be treated as indirect costs. For example, if insurance, telecommunication, or IT costs are charged as a direct expense, explain reason and methodology. Add additional lines as needed.

N/A

MODIFIED TOTAL DIRECT COSTS (MTDC) AND INDIRECT (F&A) COSTS (SEE TERMS AND CONDITIONS)

*Indirect costs are calculated on the modified total direct costs (MTDC) in accordance with the budgeted indirect cost rate (Limit 25% maximum). The MTDC includes **up to the first \$25,000 of each subcontract**; the portion of each subcontract in excess of \$25,000 is not included in the MTDC.*

Indirect Cost Rate (%): **N/A**

Subcontractor/Subrecipient Budgets

(when applicable; submit separate budget and budget justification for each)

Subcontractor/Subrecipient: Ag Aeronauticals Inc.

Principal Investigator: Mike Rowbes

Organization: University of California

SUBCONTRACTOR/SUBRECIPIENT BUDGET FOR ENTIRE PROPOSED PROJECT PERIOD: 07/01/2025 to 06/30/2028

BUDGET CATEGORY	Year 1 7/1/2025 – 6/30/2026	Year 2 7/1/2026 – 6/30/2027	Year 3 7/1/2027 – 06/30/2028	TOTAL
PERSONNEL: <i>Salary and fringe benefits.</i>	\$0	\$4,349	\$8,697	\$13,046
TRAVEL	\$0	\$1,744	\$3,008	\$4,752
MATERIALS & SUPPLIES	\$0	\$0	\$0	\$0
EQUIPMENT	\$0	\$0	\$0	\$0
RENT	\$0	\$0	\$0	\$0
SUBCONTRACTOR #1 (IDC allowed up to 25% on first \$25,000)	\$0	\$0	\$0	\$0
SUBRECIPIENT #1 (UC/CSU applicants only, IDC not allowed)	\$0	\$0	\$0	\$0
OTHER DIRECT COST #1: Equipment Operations Subject to IDC: Y	\$0	\$2,400	\$4,800	\$7,200
OTHER DIRECT COST #2: Subject to IDC: Y/N	\$0	\$0	\$0	\$0
TOTAL DIRECT COSTS	\$0	\$8,493	\$16,505	\$24,998
MODIFIED TOTAL DIRECT COSTS (F&A Base)	\$0	\$8,493	\$16,505	\$24,998
INDIRECT (F&A) COSTS Rate: N/A	\$0	\$2,123	\$4,126	\$6,249
TOTAL COSTS PER YEAR	\$0	\$10,616	\$20,631	
TOTAL COSTS FOR THE PROJECT PERIOD				\$31,247

* MTDC = Modified Total Direct Cost

JUSTIFICATION: *Follow the budget justification instructions.*

Subcontractor/Subrecipient Budget Justification (when applicable)

The budget justification will include the following items in this format. Identify and report in-kind contributions of personnel time, equipment, facilities, and materials by team members. Complete a separate budget justification (see below) for each subrecipient (UC/CSU applicants only) or subcontractor.

For all applicable items reported in this budget justification section, the corresponding sheet in the subaward budget tables worksheet (Microsoft Excel) must be completed in full. Numbers contained in the subaward budget tables worksheet must match the numbers reported in this budget justification section.

PERSONNEL

Name. Starting with the principal investigator, list the names of all known personnel who will be involved on the project for each year of the proposed project period. Include all collaborating investigators, individuals in training, technical and support staff and include any “to-be-determined” (TBD).

Ava Aeter
Emma McCannick

Role on Project. For each personnel listed by name, including “to-be-determined” (TBD) positions, list their role on the project. Add additional lines as needed.

Ava Aeter, Drone Operator, AgAeronauticals Inc, 18% effort per month in Year 2, 36% effort per month in Year 3. Fully licensed and trained drone operator. Will create flight plans and conduct all drone releases of parasitoid wasps.

Emma McCannick, Drone Technician, AgAeronauticals Inc, 18% effort per month in Year 2, 36% effort per month in Year 3. Will conduct flight support operations including drone and flight equipment set up, pre-flight diagnostics, battery recharging and loading and unloading of payloads, and will perform any on-site maintenance.

Salary. For all personnel, including “to-be-determined” positions, list the salary per year and the total salary. Additionally, note any in-kind salary contributions. Add additional lines as needed.

Ava Aeter – Year 1 - \$0; Year 2 - \$1,875; Year 3 - \$3,750; Total: \$5,625
Emma McCannick – Year 1 - \$0; Year 2 - \$1,470; Year 3 - \$2,940; Total: \$4,410

Fringe Benefits. For all personnel, including “to-be-determined” positions, list the fringe benefits per year and the total fringe benefits. Add additional lines as needed.

Ava Aeter – Year 1 - \$0; Year 2 - \$563; Year 3 - \$1,125; Total: \$1,688
Emma McCannick – Year 1 - \$0; Year 2 - \$441; Year 3 - \$882; Total: \$1,323

Total Personnel Costs.

Yearly Salary Totals

Year 1 - \$0; Year 2 - \$3,345; Year 3 - \$6,690; Total: \$10,035

Yearly Fringe Benefits Totals

Year 1 - \$0; Year 2 - \$1,004; Year 3 - \$2,007; Total: \$3,011

Yearly Personnel Totals

Year 1 - \$0; Year 2 - \$4,349; Year 3 - \$8,697; Total: \$13,046

TRAVEL (SEE TERMS AND CONDITIONS)

*Itemize all travel requests separately by trip and justify, in accordance with University or Organizational travel guidelines. Travel and reimbursement for travel for applicants not affiliated with the University of California (UC) or the California State University (CSU) systems shall be in accordance with the [California Department of Human Resources' \(CalHR\) travel policy](#). For trips that occur over multiple years, include as separate trips. Add additional trips as needed. **No out-of-state travel may be included in the budget.***

TRIP #1

Trip Occurs in: Year 1 Year 2 Year 3

Origin: Salinas, CA

Destination: Bakersfield area

Duration (number of days and number of nights): 2 days, 2 nights

Personnel Names: Ava Aeter, Emma McCannick

Purpose: March and June drone releases of parasitoid wasps.

Total Cost per Trip: \$872

Number of Trip Occurrences: 2

Trip #1 Total: \$1,744

TRIP #2

Trip Occurs in: Year 1 Year 2 Year 3

Origin: Salinas, CA

Destination: Bakersfield area

Duration (number of days and number of nights): 4 days, 4 nights

Personnel Names: Ava Aeter, Emma McCannick

Purpose: March and June drone releases of parasitoid wasps.

Total Cost per Trip: \$1,504

Number of Trip Occurrences: 2

Trip #2 Total: \$3,008

Total Travel Costs.

Year 1 - \$0; Year 2 - \$1,744; Year 3 - \$3,008; Total: \$4,752

MATERIALS AND SUPPLIES

Itemize all materials and supplies in separate categories separately by item and include a complete justification of the project's need for these items. Theft sensitive equipment (under \$5,000) must be

justified and tracked separately in accordance with State Contracting Manual Section 7.29. Add additional lines as needed.

N/A

EQUIPMENT

List each item of equipment (value greater than or equal to \$5,000 with a useful life of more than one year) with amount requested separately and justify each. List all equipment purchases by year. Add additional lines as needed.

N/A

RENT

If the Scope of Work will be performed in a facility rented from a third party for a specific project or projects, then rent may be charged as a direct expense to the award. List all facilities rented by year. Add additional lines as needed.

N/A

SUBCONTRACTOR

Each subcontractor must submit a separate detailed budget for every year in the project period. Add additional lines as needed. Include a complete Budget Justification for the need for any subcontractor listed in the application.

N/A

SUBRECIPIENT (UC/CSU APPLICANTS ONLY)

Each subrecipient must submit a separate detailed budget for every year in the project period. Add additional lines as needed. Include a complete Budget Justification for the need for any subrecipient listed in the application.

N/A

OTHER DIRECT COSTS (ODC)

Itemize any other expenses by category and include a complete justification of the project's need for these expenses. Specifically include and justify costs that may typically be treated as indirect costs. For example, if insurance, telecommunication, or IT costs are charged as a direct expense, explain reason and methodology. Add additional lines as needed.

Equipment Operations – Year 1 - \$0; Year 2 - \$2,400; Year 3 - \$4,800; Total: \$7,200

Subject to Indirect Costs (IDC): Yes No

Other Direct Costs (ODC) Justification: Compensation for drone operations, which incorporates the cost of licenses, software, insurance, equipment depreciation, generator fuel consumption, and materials for maintenance.

MODIFIED TOTAL DIRECT COSTS (MTDC) AND INDIRECT (F&A) COSTS (SEE TERMS AND CONDITIONS)

*Indirect costs are calculated on the modified total direct costs (MTDC) in accordance with the budgeted indirect cost rate (Limit 25% maximum). The MTDC includes **up to the first \$25,000 of each subcontract**; the portion of each subcontract in excess of \$25,000 is not included in the MTDC.*

Indirect Cost Rate (%): 25%

Modified Total Direct Costs (MTDC) – Year 1 - \$0; Year 2 - \$8,493; Year 3 - \$16,505; Total: \$24,998

Total Indirect Costs

Year 1 - \$0; Year 2 - \$2,123; Year 3 - \$4,126; Total: \$6,249

Subcontractor/Subrecipient Budgets

(when applicable; submit separate budget and budget justification for each)

Subcontractor/Subrecipient: UC Agriculture and Natural Resources

Principal Investigator: Mike Rowbes

Organization: University of California

SUBCONTRACTOR/SUBRECIPIENT BUDGET FOR ENTIRE PROPOSED PROJECT PERIOD: 07/01/2025 to 06/30/2028

BUDGET CATEGORY	Year 1 7/1/2025 – 6/30/2026	Year 2 7/1/2026 – 6/30/2027	Year 3 7/1/2027 – 06/30/2028	TOTAL
PERSONNEL: <i>Salary and fringe benefits.</i>	\$0	\$38,372	\$39,933	\$78,305
TRAVEL	\$0	\$0	\$0	\$0
MATERIALS & SUPPLIES	\$0	\$0	\$0	\$0
EQUIPMENT	\$0	\$0	\$0	\$0
RENT	\$0	\$0	\$0	\$0
SUBCONTRACTOR #1 (IDC allowed up to 25% on first \$25,000)	\$0	\$0	\$0	\$0
SUBRECIPIENT #1 (UC/CSU applicants only, IDC not allowed)	\$0	\$0	\$0	\$0
OTHER DIRECT COST #1: Equipment Rental Subject to IDC: Y	\$0	\$0	\$3,000	\$3,000
OTHE DIRECT COST #2: Subject to IDC: Y/N	\$0	\$0	\$0	\$0
TOTAL DIRECT COSTS	\$0	\$38,372	\$42,933	\$81,305
MODIFIED TOTAL DIRECT COSTS (F&A Base)	\$0	\$38,372	\$42,933	\$81,305
INDIRECT (F&A) COSTS Rate: N/A	\$0	\$9,593	\$10,733	\$20,326
TOTAL COSTS PER YEAR	\$0	\$47,965	\$53,666	
TOTAL COSTS FOR THE PROJECT PERIOD				\$101,631

* MTDC = Modified Total Direct Cost

JUSTIFICATION: Follow the budget justification instructions.

Budget Flexibility: Prior approval is required for all budget changes.

Subcontractor/Subrecipient Budget Justification (when applicable)

The budget justification will include the following items in this format. Identify and report in-kind contributions of personnel time, equipment, facilities, and materials by team members. Complete a separate budget justification (see below) for each subrecipient (UC/CSU applicants only) or subcontractor.

For all applicable items reported in this budget justification section, the corresponding sheet in the subaward budget tables worksheet (Microsoft Excel) must be completed in full. Numbers contained in the subaward budget tables worksheet must match the numbers reported in this budget justification section.

PERSONNEL

Name. Starting with the Principal Investigator, list the names of all known personnel who will be involved on the project for each year of the proposed project period. Include all collaborating investigators, individuals in training, technical and support staff and include any “to-be-determined” (TBD).

Akar Radge, Co-PI
Walt Zindafeld
Junior Specialist (TBD)

Role on Project. For each personnel listed by name, including “to-be-determined” (TBD) positions, list their role on the project. Add additional lines as needed.

Akar Radge, Viticulture and Tree Fruit Advisor, Central Valley Counties, University of California Cooperative Extension, 5% effort in-kind, no salary requested. Will interface with growers to locate and establish field sites, assist with project design, supervise all field work, and extend results to stakeholders.

Walt Zindafeld, Staff Research Associate, University of California Cooperative Extension, 30% effort in Years 2 and 3. Will lead and conduct all field experiments and assist in sample collection.

Junior Specialist (TBD), University of California Cooperative Extension, 50% effort in Years 2 and 3. Will assist the Staff Research Associate in all field experiments and sample collection.

Salary. For all personnel, including “to-be-determined” positions, list the salary per year and the total salary. Additionally, note any in-kind salary contributions. Add additional lines as needed.

Akar Radge – Year 1 - \$0, in-kind; Year 2 - \$0, in-kind; Year 3 - \$0, in-kind; Total: \$0, in-kind
Walt Zindafeld – Year 1 - \$0; Year 2 - \$15,600; Year 3 - \$16,068; Total: \$31,668
Junior Specialist (TBD) – Year 1 - \$0; Year 2 - \$15,000; Year 3 - \$15,450; Total: \$30,450

Fringe Benefits. For all personnel, including “to-be-determined” positions, list the fringe benefits per year and the total fringe benefits. Add additional lines as needed.

Akar Radge – Year 1 - \$0, in-kind; Year 2 - \$0, in-kind; Year 3 - \$0, in-kind; Total: \$0, in-kind

Sample Scope of Work and Budget

Walt Zindafeld – Year 1 - \$0; Year 2 - \$3,962; Year 3 - \$4,290; Total: \$8,252

Junior Specialist (TBD) – Year 1 - \$0; Year 2 - \$3,810; Year 3 - \$4,125; Total: \$7,935

Total Personnel Costs.

Yearly Salary Totals

Year 1 - \$0; Year 2 - \$30,600; Year 3 - \$31,518; Total: \$62,118

Yearly Fringe Benefits Totals

Year 1 - \$0; Year 2 - \$7,772; Year 3 - \$8,415; Total: \$16,187

Yearly Personnel Totals

Year 1 - \$0; Year 2 - \$38,372; Year 3 - \$39,933; Total: \$78,305

TRAVEL (SEE TERMS AND CONDITIONS)

*Itemize all travel requests separately by trip and justify, in accordance with University or Organizational travel guidelines. Travel and reimbursement for travel for applicants not affiliated with the University of California (UC) or the California State University (CSU) systems shall be in accordance with the [California Department of Human Resources' \(CalHR\) travel policy](#). For trips that occur over multiple years, include as separate trips. Add additional trips as needed. **No out-of-state travel may be included in the budget.***

N/A

MATERIALS AND SUPPLIES

Itemize all materials and supplies in separate categories separately by item and include a complete justification of the project's need for these items. Theft sensitive equipment (under \$5,000) must be justified and tracked separately in accordance with State Contracting Manual Section 7.29. Add additional lines as needed.

N/A

EQUIPMENT

List each item of equipment (value greater than or equal to \$5,000 with a useful life of more than one year) with amount requested separately and justify each. List all equipment purchases by year. Add additional lines as needed.

N/A

RENT

If the Scope of Work will be performed in a facility rented from a third party for a specific project or projects, then rent may be charged as a direct expense to the award. List all facilities rented by year. Add additional lines as needed.

N/A

SUBCONTRACTOR

Each subcontractor must submit a separate detailed budget for every year in the project period. Add additional lines as needed. Include a complete Budget Justification for the need for any subcontractor listed in the application.

N/A

SUBRECIPIENT (UC/CSU APPLICANTS ONLY)

Each subrecipient must submit a separate detailed budget for every year in the project period. Add additional lines as needed. Include a complete Budget Justification for the need for any subrecipient listed in the application.

N/A

OTHER DIRECT COSTS (ODC)

Itemize any other expenses by category and include a complete justification of the project’s need for these expenses. Specifically include and justify costs that may typically be treated as indirect costs. For example, if insurance, telecommunication, or IT costs are charged as a direct expense, explain reason and methodology. Add additional lines as needed.

Equipment Rental – Year 1 - \$0; Year 2 - \$0; Year 3 - \$3,000; Total: \$3,000

Subject to Indirect Costs (IDC): Yes No

Other Direct Costs (ODC) Justification: Rental of a 30-horsepower tractor and a tow-behind sprayer to apply the prophylactic treatment in vineyards for Task 4.1.

MODIFIED TOTAL DIRECT COSTS (MTDC) AND INDIRECT (F&A) COSTS (SEE TERMS AND CONDITIONS)

*Indirect costs are calculated on the modified total direct costs (MTDC) in accordance with the budgeted indirect cost rate (Limit 25% maximum). The MTDC includes **up to the first \$25,000 of each subcontract**; the portion of each subcontract in excess of \$25,000 is not included in the MTDC.*

Indirect Cost Rate (%): 25%

Modified Total Direct Costs (MTDC) – Year 1 - \$0; Year 2 - \$38,372; Year 3 - \$42,933; Total: \$81,305

Total Indirect Costs

Year 1 - \$0; Year 2 - \$9,593; Year 3 - \$10,733; Total: \$20,326