SUMMARY | PEST MANAGEMENT ADVISORY COMMITTEE GRANT REVIEW MEETING
CALIFORNIA DEPARTMENT OF PESTICIDE REGULATION
Feb 13, 2014
Produced by the Center for Collaborative Policy, CSU Sacramento

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1. Attendance

Pest Management Advisory Committee (PMAC) Members

1. Anne Katten, California Rural Legal Assistance Foundation
2. Caroline Cox, Center for Environmental Health
3. Cliff Ohmart, SureHarvest
4. David Bakke, US Forest Service
5. Jenny Broome, Driscoll Strawberry Associates, Inc.
6. John Steggall, California Department of Food and Agriculture
7. Joseph Grant, UC Cooperative Extension
8. Keith Pitts, Marrone Bio Innovations, Inc.
9. Marcia Gibbs, Sustainable Cotton Project
10. Mary Grisier, U.S. EPA, Region IX
11. Nicole Quinonez, Randlett Nelson Madden
12. Rebecca Sisco, UC Davis, Western Region IR4 Program
13. Renee Rianda, Morning Star Packing Co.
14. Terry Gage, California Agricultural Aircraft Association
15. William Thomas, California Cattlemen's Association

Interested Parties

16. Kyle Lawson, Lawson and Associates
17. Rachel Kubiak, Western Plant Health Association
18. Kelsey Blegen, California Cattlemen's Association

California Department of Pesticide Regulation (DPR)

19. Brian Leahy, Director
20. Ann Schaffner
21. April Gatlin
22. Charlotte Fadipe
23. Christine Uhrik
24. Daniel Rubin
25. Doug Downie
26. Drew Saruwatari
27. Kimberly Steinmann
28. Nan Gorder
29. Mark Robertson
30. Marta Barlow
31. Marshall Lee
32. Paul Verke

Facilitation Support

33. Sam Magill, Center for Collaborative Policy, CSUS
34. Orit Kalman, Center for Collaborative Policy, CSUS

2. Background

Introductions and Chair's opening comments

Brian Leahy, Director of the Department of Pesticide Regulation (DPR), welcomed new Pest Management Advisory Committee (PMAC) members, Mark Martinez and Claudia Reid with the California Strawberry Commission, and thanked everyone for joining the meeting. Mr. Leahy shared that the new members are expected to join the PMAC at the next meeting. DPR's Pest Management Research Grant Program has $500,000 available annually for funding proposals. The primary objective of the research grant program is to stimulate innovation and progress in California. DPR received twelve concept proposals and seven concept sponsors were invited to submit full proposals. The seven full proposals were reviewed by PMAC members with the use of the web based Financial Assistance Application Submittal Tool (FAAST) for the first time.

Background on DPR's Pest Management Research Grant Program and Basic Procedures

Dr. Kimberly Steinmann provided an overview of the grant application process and the seven proposals.

Key grant program milestones are as follows:

- Concept proposals were received by October 7, 2013.
- Full proposals were received by December 16, 2013.
- Following the review period, grant projects will be selected March 21, 2014.
- Project start date is July 1, 2014.
- Researchers will present their grant projects to PMAC November 9, 2016.

The research grant projects must focus on integrated pest management (IPM) solutions to risks associated with field fumigants and must address at least one of the following:

- Decision-making
- Prevention and management of pests currently controlled by fumigants
- Application technologies
- Cost effectiveness of reduced risk practices
- Modeling or meta-analyses

PMAC members were asked to review seven full proposals. The grant program has $500,000 annually to fund two to four projects that are typically two and one half years in duration. The following table summarizes the seven proposals that were selected for PMAC review:

2014/2015 Research Grant Summary of Submitted Proposals		
Proposal	**Principle Investigator**	**Budget**
Improving Efficacy of Biologically Mediated Soilborne Disease Management in Strawberry by the Use of Reduced Rate Fumigations	**Dan Legard**, California Strawberry Commission	$298,472
Development of a Mobile Steam Applicator to Replace Fumigants for Strawberry	**Steven Fennimore** The Regents of the University of California	$294,612
Optimizing Solarization-Based Technologies as Sustainable Alternatives to Soil Fumigation	**James Stapleton** University of California	$299,992
Mobile Concentrated Solar Soil Solarization for a Reduced Pesticide and Energy-Use Sustainable Agriculture	**Serhan Ardanuç** Suntomics	$179,515
Field Permeability of Fumigant Vapor Retentive Tarps: Implications for Buffer Zones, VOC Regulations and Township Caps	**Husein Ajwa** The Regents of the University of California	$90,000
Determining the Impacts of Plant Parasitic Nematodes and Soil Fumigation on Pistachio Growth	**David Doll** University of California Cooperative Extension Merced County	$74,384
Managing Nematode Parasitism and Prunus Replant Disease with Spot Fumigation and Rootstocks	**David Doll** University of California Cooperative Extension Merced County	$108,433

Dr. Steinmann reviewed the meeting's goals: (1) to record merits and concerns of the proposals, (2) to rank the seven proposals in order of preference, and (3) to provide DPR with feedback on the use of FAAST when reviewing proposals.

Dr. Steinmann reminded the PMAC that committee members are not eligible to receive funds through a project unless they recuse themselves from the grant review process for that project. However, organizations with which PMAC members are generally associated are eligible for funding. In addition, only PMAC members who submitted review scores prior to the meeting may vote and rank during the discussion.

A PMAC member commented that it would have been helpful to have copies of the full proposals at the meeting for reference.

Dr. Steinmann introduced the facilitator, Mr. Sam Magill, from the Center for Collaborative Policy, California State University, Sacramento. Mr. Magill reviewed the meeting ground rules and meeting goals.

3. Rankings Based on Reviewers' Scoring

Prior to the meeting, fifteen PMAC members reviewed and scored the seven proposals. The numeric scores were converted to ranks, where 1 was the most highly regarded proposal and 7 was the least, as presented in the following chart:

2014/2015 Research Grant Review Summary by Reviewer																				
Project	ORDER	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15	AVG	High	Low	$ Requested
Legard	1	2.0	3.5	4.0	3.0	2.5	5.5	1.0	2.0	5.0	1.0	1.0	6.0	5.0	2.0	6.0	3.3	1	6	$ 298,472
Doll – Prunus Replant Disease	2	3.0	1.0	6.0	4.0	1.0	4.0	6.0	5.5	4.0	5.5	3.0	3.5	1.0	1.0	1.0	3.3	1	6	$ 108,433
Doll – Pistachio	3	1.0	5.0	2.5	2.0	5.0	2.5	7.0	3.0	6.0	5.5	4.0	2.0	3.0	3.0	2.0	3.6	1	7	$ 74,384
Fennimore	4	5.0	2.0	1.0	5.0	2.5	2.5	3.5	4.0	2.0	4.0	2.0	5.0	6.0	5.0	4.0	3.6	1	6	$ 294,612
Stapleton	5	7.0	6.0	7.0	6.0	6.0	1.0	5.0	5.5	1.0	2.0	5.0	1.0	4.0	4.0	7.0	4.5	1	7	$ 299,992
Ardanuç	6	6.0	7.0	2.5	1.0	4.0	5.5	2.0	7.0	3.0	7.0	7.0	3.5	2.0	6.5	4.0	4.5	1	7	$ 179,515
Ajwa	7	4.0	3.5	5.0	7.0	7.0	7.0	3.5	1.0	7.0	3.0	6.0	7.0	7.0	6.5	4.0	5.2	1	7	$ 90,000

The following PMAC members contributed initial review scores: Anne Katten, Caroline Cox, Cliff Ohmart, David Bakke, Jenny Broome, John Steggall (for Amrith Gunasekara), Joseph Grant, Kassim Al-Khatib (not in attendance), Keith Pitts (for Pam Marrone), Marcia Gibbs, Mary Grisier, Nicole Quinonez, Rebecca Sisco, Terry Gage, and William Thomas.

4. Discussion of Proposals

The initial discussion focused on the merits and concerns that PMAC members identified when scoring each proposal. Below is a summary of PMAC members' comments for each of the seven proposals. Comments reflect individual PMAC member observations, not consensus opinions. Thus, merits and concerns may occasionally appear to be contradictory.

1. Legard: Improving Efficacy of Biologically Mediated Soilborne Disease Management in Strawberry by the Use of Reduced Rate Fumigations

Concerns

- It appears that the project will provide few results during the grant period.
- Details of overall design and use of mustard seed was difficult to understand.
- The experimental design does not provide for adequate control.
- Other anaerobic soil disinfestation (ASD) research by this group is being supported with separate funds.
- The methods descriptions are difficult to follow.
- The ability of 50 pounds of fumigant per acre to effectively move through the soil and provide adequate pest management is questionable.
- The second of the two proposed hypotheses does not explain what will be tested.

- This project does not meet the grant program's objective of innovation.

Merits

- The project's approach is reasonable.
- The project team is respected and well regarded and the budget is reasonable.
- The proposal has scientific merit. Previous work suggests that ASD practices have residual effects that control pathogens several years after treatment.
- This proposal will expand collective understanding of soil health and contribute to other research efforts.
- The proposal will use DNA sequencing to identify the types of microbes present in fumigated and non-fumigated soils.
- The proposal includes a partnership with the California Strawberry Commission, which will help assure that the practices to be researched will be practical and, if shown to be viable, advocated for adoption.
- The practices to be researched, if viable, could be an important element in future IPM programs.

Clarification

- Explanation for second hypothesis: Researchers are trying to determine the aspects of the anaerobic disinfestation process that affect microbes in the soil. This baseline information would allow researchers to adjust the soil composition to favor non-pathogenic microbes in order to ultimately avoid having to sterilize the soil. DNA sequencing will be used to identify the microbes found in the soil.

2. Doll: Managing Nematode Parasitism and Prunus Replant Disease (PRD) with Spot Fumigation and Rootstocks

Concerns

- The proposed project has limited application because it focuses on one trial, one site, and one crop (i.e., almonds), and one planting time. The narrowly defined experimental conditions may limit applicability to other conditions.
- The proposal has a limited term, which is insufficient when studying management strategies for nematodes. A more appropriate duration for such a research project may be 8-10 years.

Merits

- The proposal focuses on almonds, which is an important crop (one million acres grown in California).
- The Doll proposals for PRD and pistachios have merit if funded together.
- The proposal is practical and logical.

- The principle investigator (PI) has a great connection with growers and therefore results are likely to be shared and applied by growers.
- The proposal can be broken into two parts: the GPS portion (i.e., using global positioning system (GPS) software to target fumigant treatments) and the rootstock portion (i.e., using rootstock cultivars resistant to nematodes and PRD to reduce fumigant use). The rootstock portion is important and perhaps more funds should be devoted to it.
- Although GPS-guided spot fumigation is effective against fungal pathogens, it is important to look at the effectiveness of spot treatment to control nematodes, which are more mobile.

Clarification

- A PMAC member inquired about the Almond Board's investment in fumigation studies and the chances for getting meaningful results from them. Other participants did not have an answer to this question.
- PMAC members recognized that the duration of the proposed project is limited by the relatively short funding period and acknowledged that pest management research projects require long-term funding.

3. Doll: Determining the Impacts of Plant Parasitic Nematodes and Soil Fumigation on Pistachio Growth

Concerns

- The proposal has limited application because it is focused on one trial, one site, new planting, and one crop (i.e., pistachios). This limited application will result in limited ability to extrapolate results and limited applicability to other conditions.
- Doll's PRD proposal is preferable. There doesn't seem to be as critical a need to investigate pistachio fumigation as there is with almonds.
- This proposal is a response to an effort to expand the range where pistachios can be grown.

Merits

- The research addresses a different crop than the more typically studied crops (e.g., almonds and strawberries).
- The proposal asks a prudent question regarding the need for fumigation and nematode management.
- The proposal's budget is appropriate for the proposed work.
- The proposal addresses growers concerns and questions regarding tree crops.

Clarification

- This proposal is limited to the research grant timeline, which is too short to answer the research question; the proposal is part of a 10-year research project.

4. Fennimore: Development of a Mobile Steam Applicator to Replace Fumigants for Strawberry

Concerns

- More than half of the proposal's budget is allocated to equipment. Equipment may be more appropriately funded through private enterprise than the research grant.
- The proposal did not clearly specify what will be done with the equipment at the end of the project.
- The proposal notes that steam fumigation technology already exists, but does not clearly explain how using new equipment will address concerns about the feasibility of steam technology. Effectiveness and adoptability are also not adequately addressed in the proposal.
- The proposal does not explain how the results of the project would be incorporated into an IPM system.
- There is concern for the equipment's carbon footprint and use of water and petroleum-based fuels.
- The proposal is very expensive.

Merits

- The proposal explains that existing technology is inefficient and not cost effective. This is a new alternative technology.
- The proposed project will use an improved version of equipment for pathogen steam control that growers are excited about. With the improved equipment, the treatment time for an acre will be reduced from 20 hours to 8 hours.
- This type of equipment will initially be used by the strawberry industry, but in the future, there is a potential for nursery use.
- The proposal has a highly regarded team.
- This proposal provides an alternative to fumigants.

Clarifications

- Concerns over the equipment: The proposed equipment may provide innovation in pest management although it was recognized that when the research is complete, the equipment is likely to have no resale value. Therefore ownership of the equipment at the end of the project is irrelevant.

5. Stapleton: Optimizing Solarization-Based Technologies as Sustainable Alternatives to Soil Fumigation

Concerns

- The proposal does not provide a clear experimental design.
- The proposal is not associated with a specific crop.

- The proposal's budget is very expensive.

Merits

- The proposal describes background research that identifies where this technology may work successfully using GPS and modeling techniques.
- The proposal addresses the need to know more about changes in the soil microbial community over time.
- This proposal is innovative, and solarization has potential to be a viable practice to manage soil microbial communities.
- The proposal has a highly regarded team.

Clarification:

- The proposal stated that adding organic material to the soil prior to solarization enhances effectiveness, and PMAC members asked for clarification. Previous research demonstrated that solarization performed better across various film types when organic material was incorporated beforehand.
- There is some overlap between the solarization techniques of this proposal and ASD techniques in Legard's proposal; however both projects provide distinctly different approaches to reducing fumigant use.

6. Ardanuç: Mobile Concentrated Solar Soil Solarization for a Reduced Pesticide and Energy-Use Sustainable Agriculture

Concerns

- The proposal did not provide sufficient description of the project's activities.
- The proposal did not provide sufficient information on the device to be used.
- The research group's knowledge of agriculture and IPM seemed very minimal.
- The research group sponsoring this proposal is based in New York, and there is lack of local connection to agriculture in California.
- The proposal lacked data to demonstrate the applicability of the prototype device.

Merits

- Of the two proposals that focused on solarization, this proposal was preferable.
- This proposal meets the research grant's objective of innovation.
- If this proposal is not funded, the research team should be encouraged to apply again next year.

7. Ajwa: Field Permeability of Fumigant Vapor-Retentive Tarps: Implications for Buffer Zones, VOC Regulations, and Township Caps

Concerns

- The proposal does not offer an IPM solution and does not change fumigant application rates.
- The proposal does not fit the research grant objectives.
- The proposal's scope is limited because it focuses on fumigant emissions rather than pathogen control. Earlier research has already addressed the emissions question.
- The proposed technology has been looked at for the past twenty years, and there is no need for additional research and data.

Merits

- The proposal is well written.
- The proposal's budget is reasonable.
- The proposal's objectives are clear and would reduce fumigant applications.

5. Revised Rankings and Additional Discussion

Based on the discussion, PMAC members re-ranked the seven proposals. Results are shown in the table below.

2014/2015 Research Grant Review Summary by Reviewer, Meeting Poll																	
Project	ORDER	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	AVG	High	Low	$ Requested
Legard	1	5	1	1	1	1	1	1	4	1	5	1	1	1.92	1	5	$ 298,472
Fennimore	2	1	6	4	3	4	3	6	1	4	1	5	2	3.33	1	6	$ 294,612
Doll – Pistachio	3	3	4	2	5	5	2	5	3	2	4	2	7	3.67	2	7	$ 74,384
Stapleton	4	2	2	5	2	3	5	2	7	6	2	4	5	3.75	2	7	$ 299,992
Doll – Prunus Replant Disease	5	4	3	3	6	2	4	4	5	3	3	3	6	3.83	2	6	$ 108,433
Ardanuç	6	6	5	7	4	6	6	7	2	5	6	7	3	5.33	2	7	$ 179,515
Ajwa	7	7	7	6	7	7	7	3	6	7	7	6	4	6.17	3	7	$ 90,000

A PMAC member suggested that the discussion should focus on the top five ranking proposals since the ranking for the bottom two proposals has not changed. Another member suggested focusing on proposals that ranked 2 through 5.

PMAC members reiterated their concerns about the Fennimore proposal. Particularly, members were concerned about the appropriateness of spending funds on equipment and the potential carbon footprint of using the equipment. DPR reiterated that the equipment will have

no resale value at the end of the project. Therefore PMAC members should not be concerned about the disposition of the equipment at the end of the project.

Mr. Leahy added that the focus on soil biology is important. Since three of the projects (Legard, Fennimore, and Stapleton) have budgets near $300,000, Mr. Leahy asked for guidance from PMAC members on selecting among those projects. The discussion focused on three main issues: the limitation of available grant funds, selection among the ≈$300,000 budget proposals, and the merits of funding one or both of the Doll proposals. Below are comments provided by PMAC members on these topics.

Funding limitations:

- A member commented that if one proposal is funded for $300,000 there is not enough to fund another large proposal and inquired on the flexibility of DPR to fund a partial proposal. Mr. Leahy responded that DPR can only fund full proposals and cannot exceed the grant program's $500,000 limit. A previous effort to amend a proposal budget was unsuccessful and resulted in an ineffective project when components were taken out.
- A member suggested that DPR consider capping the budget of proposals to half the total available grant funding.
- A member suggested encouraging PIs to identify other funding sources. For example, for the Fennimore proposal, it was suggested that the equipment be purchased with other funds and that DPR will fund the remaining part of the project. Mr. Leahy responded that it is difficult to renegotiate projects, and there is limited time to secure additional funding. The proposals need to be evaluated based on how well they fulfill the solicitation's requirements.
- There was concern over the short timeframe of the funding period; longer research periods are needed for yield studies, particularly for tree crops. A member offered that it is appropriate to fund research projects that address one specific question, as well as projects that address complex issues.

Large budget proposals:

- The Legard proposal addresses microbial communities and how treatments affect these communities. This proposal advances research and expands beyond ASD.
- Although the steam treatment is not a stand-alone solution, it is useful in buffer zones and may be an interesting approach in sensitive areas.
- DPR needs to decide if it is appropriate to use a large portion of grant funds toward equipment purchase. Mr. Leahy responded that using grant funds for equipment is appropriate if it fulfills a valuable research need.
- A member commented on the quality of the proposals' descriptions. The Stapleton proposal was not written clearly although the project may be worthwhile.
- The Legard proposal is preferred over the Stapleton proposal.

Doll proposals:

- The Doll pistachio proposal focuses on nematodes and has similar goals and objectives as other projects.
- The Doll pistachio proposal is preferable because no similar research is currently being done on pistachios.
- Both Doll proposals should be funded if Pest Management Research Grant funding would be otherwise unused.
- The Doll proposals are driven by growers' support for the development of practical, new field practices.
- Overall, members approved of both Doll proposals.
- The Doll proposals are limited in scope and it is unclear how the results will be used for other geographic areas.
- A member was concerned about approving a low budget proposal based on funding availability rather than merit.

6. Closing Remarks

Mr. Leahy concluded the proposal review discussion by thanking PMAC members for reviewing and commenting on the proposals. DPR will advise PMAC on their final decision on which proposals to fund.

DPR is collaborating with University of California (UC), Davis on a one-day soil symposium that will be held on June 17th. The symposium will focus on soil health research and soil microbial communities and will bring soil scientists from around the country together to discuss how to improve production, determine what additional research is necessary, and work with industries and funding communities to further soil health research. As production practices trend away from reliance on pesticide use and toward enhancement of the attributes of healthy soils, IPM approaches will require testing which is expensive and currently not well funded.

Mr. Leahy shared that DPR gave the UC Statewide IPM Program (UC IPM) a contract to study reduced use of chlorpyrifos in cotton, alfalfa, citrus, and almonds.

PMAC members gave the following feedback on the use of FAAST to review the proposals:

Positive attributes

- The review went quicker with FAAST.
- This review tool is better than how we reviewed proposals in the past.
- The FAAST structure was helpful.
- Review of seven proposals was manageable.

Improvements needed

- Committee members missed the ability to quickly view different parts of each proposal to make quick comparisons.
- FAAST's word count limits did not allow enough information to be presented; researchers seemed to have to collapse information.
- Section 3, Scientific Methods, was not easily accessible.
- The Scientific Merit attachment is an important part of the proposal and should not be added as an attachment.
- The narrative section should be easily downloadable (e.g., PDF, MS Word).
- Once comments were submitted it was impossible to access them. DPR should consider providing these comments to reviewers.
- A print function would be helpful for those who prefer to read hardcopies of the proposals.

A member questioned DPR's ability to revise FAAST since it is a State Water Resources Control Board program. DPR personnel suggested that it may be possible to address some concerns by providing PDF documents of the proposals independent of the FAAST process. In addition, reviewer accounts in FAAST can be reset by DPR personnel if reviewers need to redo their reviews.