



AGENDA

PRODUCTION RESEARCH COMMITTEE TELECONFERENCE MEETING CALIFORNIA AVOCADO COMMISSION

Thursday, April 9, 2020
9:00 a.m. – 12:00 p.m. PDT

Location:

Per Governor Newsom's Executive Order N-29-20, local and state legislative bodies are authorized to hold public meetings via teleconference, with all requirements in the Bagley-Keene Act and Brown Act expressly or impliedly requiring the physical presence of members, the clerk or other personnel of the body, or the public as a condition for participation in or quorum for public meetings thereby waived.

This meeting is being held strictly as a teleconference meeting, where any participants, including members of the public, may participate in the teleconference by phone:

Conference Call #: 888.537.7715
Participant Passcode: 43373298#

AS OF FRIDAY, APRIL 3, 2020, THE FOLLOWING INDIVIDUALS HAVE ADVISED THE COMMISSION THEY WILL PARTICIPATE IN THIS MEETING VIA TELECONFERENCE:

Committee Members Participating via Teleconference:

- | | |
|------------------------|-------------------|
| 1. Leo McGuire (Chair) | 7. Tom Roberts |
| 2. Bryce Bannatyne | 8. Ed McFadden |
| 3. John Burr | 9. Ryan Rochefort |
| 4. Jim Davis | 10. Jason Cole |
| 5. Dan Grant | 11. Derek Knobel |
| 6. Darren Haver | |

- 9:00 a.m. 1. **CALL TO ORDER**
 A. Roll Call / Establish Quorum
 B. Introductions

- 9:10 a.m. 2. **OPPORTUNITY FOR PUBLIC COMMENT**

Any person may address the Committee at this time on any subject within the jurisdiction of the California Avocado Commission.

- 9:15 a.m. 3. **APPROVAL OF MINUTES**
A. Consider Approval of Production Research Committee Meeting Minutes of September 5, 2019
- 9:25 a.m. 4. **RESEARCH PROGRAM DIRECTOR'S REPORT**
A. Updates on the Gem avocado variety
- 9:35 a.m. 5. **DISCUSSION ITEMS**
A. Avocado Decision Support Tools
B. 2020-21 Research needs
- 10:30 a.m. 6. **ACTION ITEMS**
A. Consider research proposals and funding requests in response to Avocado Establishment and Production Cost Studies request for proposals
B. Consider funding request from Cal Poly San Luis Obispo for rootstock trial
- 12:00 p.m. **ADJOURN MEETING**

The times listed for each agenda item are estimated and subject to change. It is possible that some of the agenda items may not be able to be discussed prior to adjournment. Consequently, those items will be rescheduled to appear on a subsequent agenda. All meetings of the California Avocado Commission are open to the public and subject to the Bagley-Keene Open Meeting Act.

All agenda items are subject to discussion and possible action. For more information, or to make a request regarding a disability-related modification or accommodation for the meeting, please contact April Aymami at 1-800-344-4333, California Avocado Commission, 12 Mauchly, Suite L, Irvine, CA 92618, or via email at aaymami@avocado.org. Requests for disability-related modification or accommodation for the meeting should be made at least 48 hours prior to the meeting time. For individuals with sensory disabilities, this document is available in Braille, large print, audiocassette or computer disk. This meeting schedule notice and agenda is available on the internet at <http://www.californiaavocadogrowers.com/commission/meeting-agendas-minutes> and <http://it.cdffa.ca.gov/igov/postings/detail.aspx?type=Notices>.

If you have questions on the above agenda, please contact Tim Spann at tspann@avocado.org or 1-800-344-4333.

SUMMARY DEFINITION OF CONFLICT OF INTEREST

It is each member's and alternate's responsibility to determine whether they have a conflict of interest and whether they should excuse themselves from a particular discussion or vote during a meeting. To assist you in this evaluation, the following *Summary Definition of Conflict of Interest* may be helpful.

A Commission *member or employee* has a conflict of interest in a decision of the Commission if it is reasonably foreseeable that the decision will have a material effect, financial or otherwise, on the member or employee or a member of his or her immediate family that is distinguishable from its effect on all persons subject to the Commission's jurisdiction.

No Commission member or employee shall make, or participate in making, any decision in which he or she knows or should know he or she has a conflict of interest.

No Commission member or employee shall, in any way, use his or her position to influence any decision in which he or she knows or should know he or she has a conflict of interest.

**CALIFORNIA AVOCADO COMMISSION
PRODUCTION RESEARCH COMMITTEE
MEETING MINUTES**

September 5, 2019

A meeting of the Production Research Committee (PRC) of the California Avocado Commission (CAC) was held on Thursday, September 5, 2019 in the CAC board room in Irvine, California, with the following people present:

MEMBERS PRESENT:

Bryce Bannatyne
John Burr
Jim Davis
Dan Grant
Leo McGuire
Tom Roberts
Ryan Rochefort

GUESTS PRESENT:

David Holden, Holden Research &
Consulting

CAC STAFF PRESENT:

Dr. Tim Spann
April Aymami

MEMBERS ABSENT:

Darren Haver
Derek Knobel
Ed McFadden

CALL TO ORDER

Leo McGuire, Production Research Committee (PRC) Chairman, called the meeting to order at 10:00 a.m. with a quorum present.

OPPORTUNITY FOR PUBLIC COMMENT

There were no public comments.

Chairman McGuire introduced David Holden, who has been investigating the issue of scarring of young Gem fruit.

APPROVAL OF MINUTES OF JUNE 25, 2019 PRODUCTION RESEARCH COMMITTEE MEETING

MOTION

To approve the minutes of the June 25, 2019 Production Research Committee meeting.

(Rochefort/Roberts) MSC Unanimous

Motion 19-9-5-1

RESEARCH PROGRAM DIRECTOR'S REPORT

A. Laurel wilt update

Dr. Spann informed the Committee that a group of six researchers from the University of Florida visited California during the last week of July 2019 and presented a series of seminars on the research they have been conducting on laurel wilt disease. Dr. Spann stated that although the group has not found a cure for the disease, Florida avocado growers who follow the prescribed management protocol — routine scouting and removal of affected trees — are successfully managing laurel wilt in commercial avocado groves.

B. Avocado genome

Dr. Spann informed the group that the avocado genome had recently been published by an international group of researchers including representatives from Mexico, the U.S., Australia and other countries. Dr. Spann stated that the genome in and of itself does not do anything to move our industry forward; however, it does open many new research opportunities that could be of potential benefit in the long term.

DISCUSSION ITEMS

A. Gem avocado scarring update – David Holden

David Holden introduced himself to the Committee and provided some background on his research experience with avocados. Mr. Holden mentioned that he became involved in the Gem scarring issue when he was approached by an avocado handler, but that they ultimately didn't pursue a project together. However, Mr. Holden's interest in the issue continued because he had been seeing the damage in groves that he walks as a PCA. In spring 2019, Bryce and Elaine Bannatyne invited Mr. Holden to conduct a study in one of their Gem groves in Santa Paula to see if he could determine the cause of the scarring.

Mr. Holden presented the experimental program he developed in the Bannatyne's grove, which included the application of Abamectin at two different rates on three different dates. Mr. Holden noted that the trial did not include the use of wind screens to control wind damage. Mr. Holden's data showed that thrips levels were below the treatment threshold of 5 nymphs per 5 leaves in all treatments in 2019, including the untreated controls. However, despite low thrips populations, he recorded significant fruit scarring. The scarring was more prominent on fruit from the windward (west) sides of trees compared with leeward (east) sides of trees.

Mr. Holden concluded that based on his preliminary data the scarring of young Gem fruit appears to be predominantly from wind causing the fruit to rub against other fruit or leaves. However, he noted that some of the Abamectin treatments did result in a

reduction, albeit not a statistically significant one, in fruit scarring, suggesting that a small percentage of the scarring may be a result of thrips feeding.

ACTION ITEMS

A. Consider research proposals and funding requests for FY 2019-20

i. Gem avocado scarring

Before beginning the discussion on this topic Bryce Bannatyne recused himself from the discussion.

The Committee reviewed a proposal from Mr. Holden to conduct a more in-depth study of the Gem fruit scarring issue, which would include using wind screens with and without Abamectin treatments at both windy and sheltered grove locations to definitively determine the cause of the scarring. The Committee discussed the possibility of adding a polymer or other coating treatment to the trial that could serve as a protectant against wind rub. Committee Member Rochefort questioned the use of Hass assessment funds to conduct research on a variety other than Hass. April Aymami stated that CAC collects assessments on all varieties and the assessment funds collected for “other varieties” in 2019 exceeded the total cost of the Gem scarring project.

MOTION

***Motion to fund the Gem fruit scarring study with the understanding that the high volume Abamectin treatment will be replaced with a polymer treatment.
(Burr/Grant) MSC 6 Yea, 0 Nay, 1 Abstention (Bannatyne)***

Motion 19-9-5-2

ii. Avocado production cost studies

Dr. Spann began the discussion by reminding the Committee that this proposal was requested following discussion by the Committee at their May 7, 2019 meeting. Dr. Spann also reminded the group that the avocado cost studies, conducted by an independent third party, are important to the industry in cases such as lawsuits, water price negotiations, etc. Discussion ensued and the Committee agreed on the overall importance of having updated cost studies available. However, there was concern that the cost of the studies was excessive and took too long to complete. Additionally, the need for four separate cost studies — north and south, conventional and organic — was necessary or if one study could be completed with the addition of “correction factors” for things such as water costs, organic vs. conventional fertilizers, and planting density. Several members questioned whether there were other options for conducting the cost studies such as an ag economist at Fresno State University or Cal Poly, or even an independent economist.

The Committee requested that Dr. Spann develop a request for proposals to have a new cost study completed based on the discussion parameters and distributed to a broader audience of potential proposers.

iii. Avocado herbicide screening trials

Dr. Spann started this discussion by reminding the Committee that at the previous PRC meeting the Committee reviewed a proposal from Dr. Travis Bean to conduct herbicide screening trials and the Committee had asked Dr. Bean to reduce his project budget to \$90,000. Dr. Bean attempted to reduce his budget as much as possible but was unable to bring the budget down to \$90,000. The Committee agreed that they appreciated Dr. Bean's efforts to reduce his budget as much as possible. Discussion ensued about the revised proposal and the Committee questioned if the two locations proposed represented enough soil types and weed species variability. Dr. Spann reminded the group that this study's goal is to look at efficacy and phytotoxicity of various herbicides to determine which products should be pursued for full registration. Thus, there would be additional studies needed for registration during which factors such as soil type could be evaluated.

MOTION

Motion to accept the revised herbicide screening trials proposal as submitted.

(Burr/Roberts) MSC Unanimous

Motion 19-9-5-3

iv. Avocado seed weevil proactive biocontrol research

Dr. Spann started the discussion by informing the Committee that the California Department of Food and Agriculture (CDFA) has a new grant program to fund research on potential invasive species. Dr. Mark Hoddle is submitting a proposal to the CDFA program to conduct research to determine the composition of the pheromone of and develop effective traps for avocado seed and stem weevils (*Heilipus* spp.). Dr. Hoddle is asking the California Avocado Commission to provide partial matching funds for this project if it is funded by CDFA. Discussion ensued and the Committee agreed that seed weevils are a significant threat to the California avocado industry and would be a significant management challenge if they became established in California. There was discussion about whether funding this project would benefit the Mexican and other avocado industries more than the California industry since the pests are not present in California. Although the Committee agreed this is a risk of this type of research, it was felt that the potential benefits to improving monitoring for these pests in other countries of origin and the benefits of having a pheromone and trap available should the pests show up in California outweigh any downside.

MOTION

Motion to provide partial matching funds for the avocado sees weevil project if the project is funded by CDFA.

(Roberts/Davis) MSC Unanimous

Motion 19-9-5-4

ADJOURN MEETING

Leo McGuire, Production Research Committee (PRC) Chairman, adjourned the meeting at 12:50 p.m.

Respectfully submitted,

Timothy Spann
Research Program Director

EXHIBITS ATTACHED TO THE PERMANENT COPY OF THESE MINUTES

EXHIBIT A September 5, 2019 Production Research Committee AB 2720 Roll Call
Vote Tally Summary



CALIFORNIA AVOCADO COMMISSION
Production Research Committee
AB 2720 Roll Call Vote Tally Summary

To be attached to the Meeting Minutes

Meeting Name: <i>California Avocado Commission Production Research Committee Meeting</i>	Meeting Location: <i>California Avocado Commission 12 Mauchly, Suite L Irvine, CA 92618</i>	Meeting Date: <i>September 5, 2019</i>
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Attendees Who Voted	<u>MOTION</u> <u>19-9-5-1</u>	<u>MOTION</u> <u>19-9-5-2</u>	<u>MOTION</u> <u>19-9-5-3</u>	<u>MOTION</u> <u>19-9-5-4</u>
Leo McGuire, Chair	Yea	Yea	Yea	Yea
Bryce Bannatyne	Yea	Abstain	Yea	Yea
John Burr	Yea	Yea	Yea	Yea
Jim Davis	Yea	Yea	Yea	Yea
Dan Grant	Yea	Yea	Yea	Yea
Tom Roberts	Yea	Yea	Yea	Yea
Ryan Rochefort	Yea	Yea	Yea	Yea
Outcome	Unanimous	6 Yea 1 Abstention	Unanimous	Unanimous

Decision Support Tools Usage Report

The avocado Decision Support Tools (DST) website went live in early July 2018 and was online until late August 2018. During this time, 32 people created user accounts in the system. Due to a legal dispute between SureHarvest and the University of California, the site had to be taken down in late August 2018. The Commission negotiated an agreement with the University allowing the Commission to utilize the University's intellectual property in the online system while they continued seeking resolution to their dispute with SureHarvest. The DST website was reactivated in mid-February 2019.

Currently, there are 57 unique users registered in the DST system, including the original 32. Of these users, 38% (22 users) have only ever logged into the system one time, 18% (10 users) have logged in twice, and the remaining 44% (25 users) have logged in three or more times. In total, the system has been logged into 206 times by all users. One person has been utilizing the irrigation calculator and logs on frequently, accounting for 20% of total system logons. Not counting those who have logged into the system only one time and the "superuser," there has been an average of 2.6 logons by each user.

In the calendar year 2019, 36 users logged into the system a total of 130 times. Of these, 19 users logged on only once. Since October 1, 2019 – assuming people would primarily use the system after collecting their fall leaf samples – 12 users have logged on a total of 44 times. Five of these users logged on once and the "superuser" logged on 19 times. Of the remaining six users, two logged on twice, two logged on three times, one logged on four times, and one logged on six times.

On March 11, 2020, two different surveys were emailed to all the registered users. One survey went to the 22 users who created an account but never logged in again, and the other survey went to the remaining 35 users who had logged into the system at least twice. The survey questions and summary results are on the following pages, and a synopsis is provided here.

Of the 22 users who created an account and never logged back into the system, 9 responded to the survey. One respondent said the tools offered were not useful, two found the grove setup process too cumbersome and two forgot they created an account. The remaining four respondents checked other and provided written comments, which are provided in the following pages. These users were also asked to provide any written feedback they believed was relevant, and these comments are also provided on the following pages.

Of the 35 users who created an account and logged in at least twice, 11 responded to the survey. Since these users presumably had more experience with the system, they were asked to complete a more comprehensive survey. Most respondents thought the grove setup process was easy. Eight of the 11 respondents used the yield potential calculator, one used the irrigation calculator and two said they had not used either tool. Most of those who used the yield potential calculator found it very easy or easy to use, and thought the information was extremely useful or very useful. Half of those who used the yield potential calculator said it helped them to improve their fertilization practices. Most of the respondents said they were likely to use the system only

annually or every few months, and most of the users were very satisfied or satisfied with the system. Additional written comments from the respondents can be found in the following pages.

The license and hosting fees for the DST system cost approximately \$30,000 annually. Thus, in 2019, the system cost about \$833 per user (\$30k / 36 users), or \$230 per logon event. The current contract with SureHarvest for hosting and maintaining the system expires on April 14, 2020. The Production Research Committee is being asked for their input to help staff develop a recommendation to the Commission Board of Directors regarding the future of the DST system.

Avocado Decision Support Tools Survey to Single Logon Users

9 of 22 users completed the survey

Question 1: Please tell us why you have not logged onto the California Avocado Commission's Decision Support Tools website since creating your account. Please select all that apply.

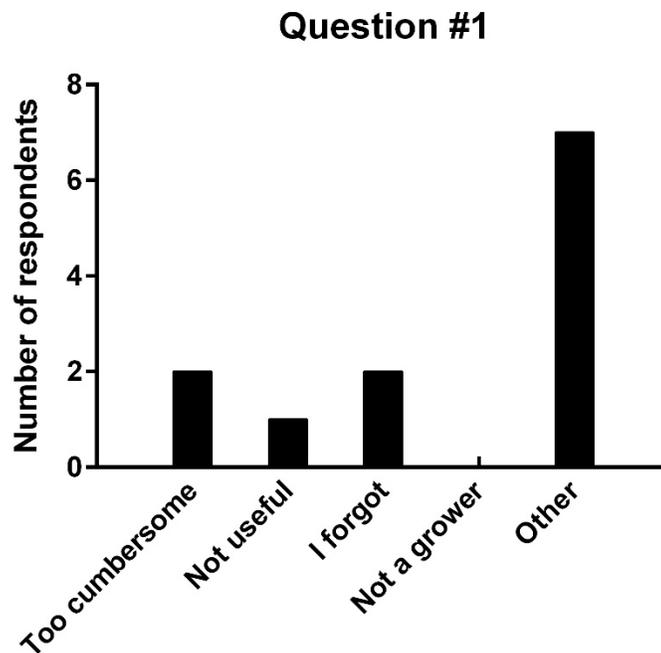
The account creation and grove setup processes were too cumbersome.

I didn't find the tools that were offered to be useful.

I forgot I created an account.

I am no longer in the avocado business.

Other



Written responses by those who chose other:

1. I logged in to use the tool, but the tool was not available at that time due to a legal dispute. I was never notified that the dispute was resolved or that the tool was available.
2. Didn't have the time to delve into it yet.
3. Initial investigation was at time of account creation. At that time I remember being unimpressed with the utility of the program. I proceeded to create a spreadsheet which calculated the required nutrients as determined by Dr. Crowley recommendations and current leaf analysis. The nutrient deficiencies and excesses are tracked for more than one year to determine the impact of applied nutrients relative to current leaf analysis and Dr. Crowley recommendations.
4. As I recall, I happened to sign up at a time that the site was undergoing an overhaul and was "off line", and I just sort of forgot about it.
5. I have CAC accounts that are linked to grove ownerships and purchase dates, they are not necessarily related to the block or units we manage.

6. I didn't have all the information needed.
7. I have been busy with other activities. This will bubble to the top of the priority list soon.

Question 2: Please share any feedback with us about the Decision Support Tools system that you feel may be relevant.

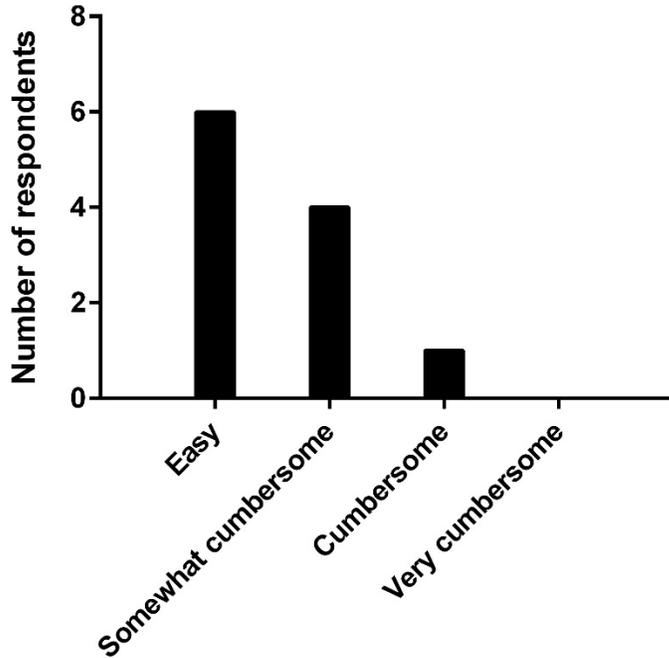
1. Need to still check it out. The recent field day reminded me that it would be very useful for me to have the tool help me analyze my fertilizer program for this season.
2. No experience with it, so no feedback.
3. Can't wait to use it... but was just too cumbersome as I remember to input block history etc. A good topic for a field day presentation or webinar.
4. Please continue refining this tool. It will be very interesting and useful to the industry to correlate inputs to yield over multiple years.
5. All of the information is relevant.
6. From what I can remember, we didn't have all of the information the decision support tool was asking for.

Avocado Decision Support Tools Survey to Multiple Logon Users

11 of 35 users completed the survey

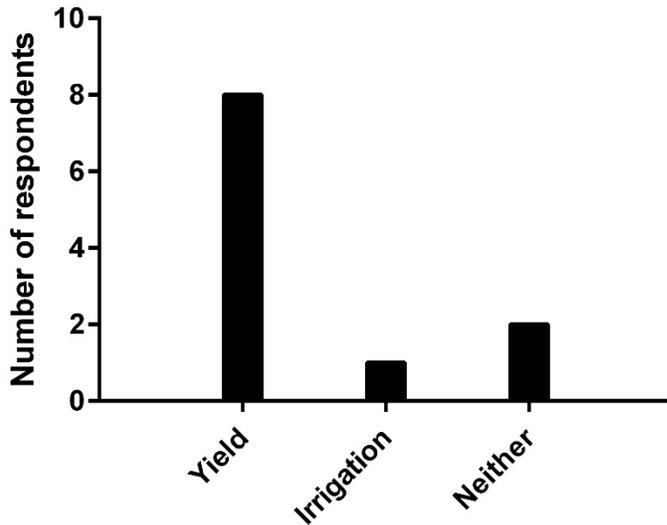
Question 1: The account creation and grove setup processes were: (11 answered, 0 skipped)

Easy; Somewhat cumbersome; Cumbersome; Very cumbersome



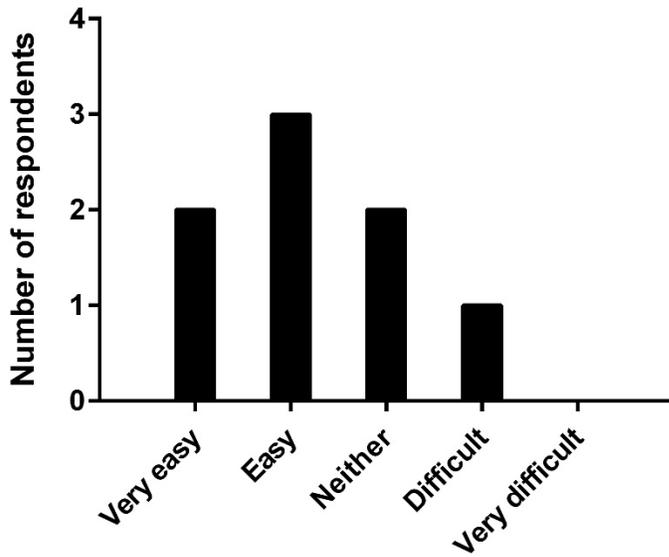
Question 2: Which of the tools on the Decision Support Tools website have you utilized for your grove? (11 answered, 0 skipped)

Yield potential calculator; Irrigation scheduler; I haven't used either of these tools



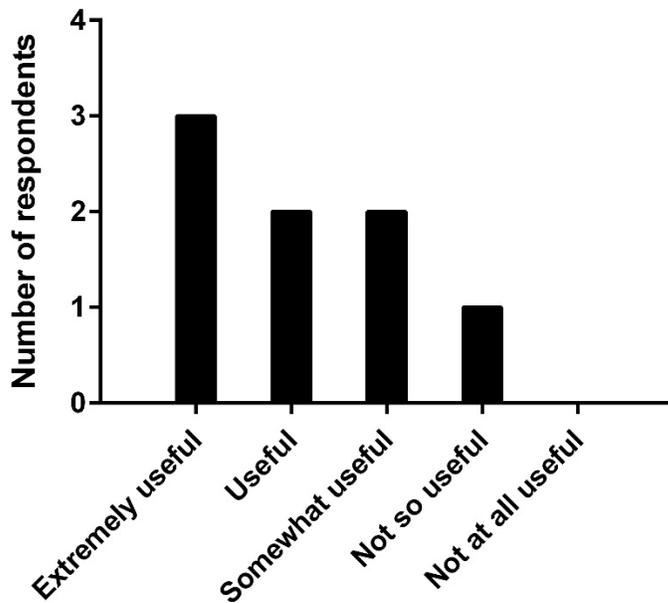
Question 3: If you have used the yield potential calculator, how easy or difficult did you find it to use? (8 answered, 3 skipped)

Very easy; Easy; Neither easy nor difficult; Difficult Very difficult



Question 4: If you have used the yield potential calculator, how useful were its recommendations? (8 answered, 3 skipped)

Extremely useful; Useful; Somewhat useful; Not so useful; Not at all useful



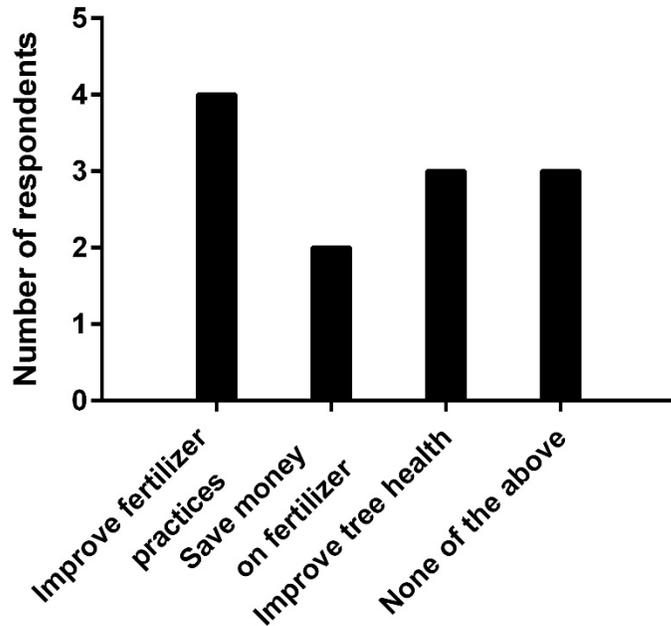
Question 5: If you have used the yield potential calculator, which of these, if any, describe your results? (8 answered, 3 skipped)

The yield potential calculator helped me improve my fertilization practices.

The yield potential calculator helped me save money on fertilizer.

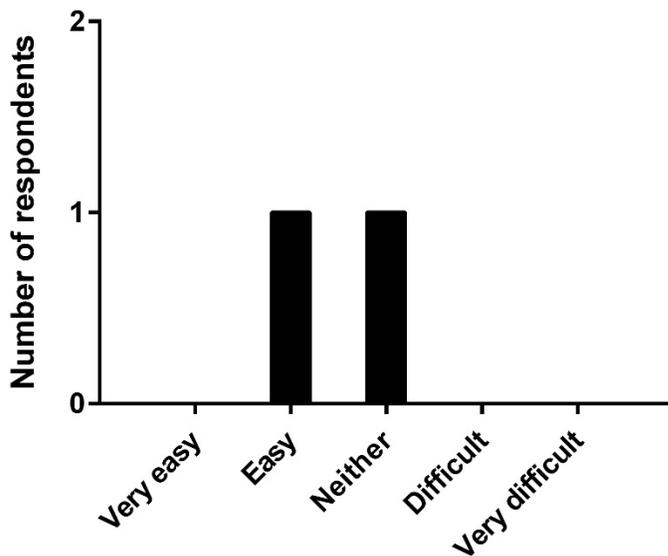
The yield potential calculator helped me improve the health of my trees.

None of the above.



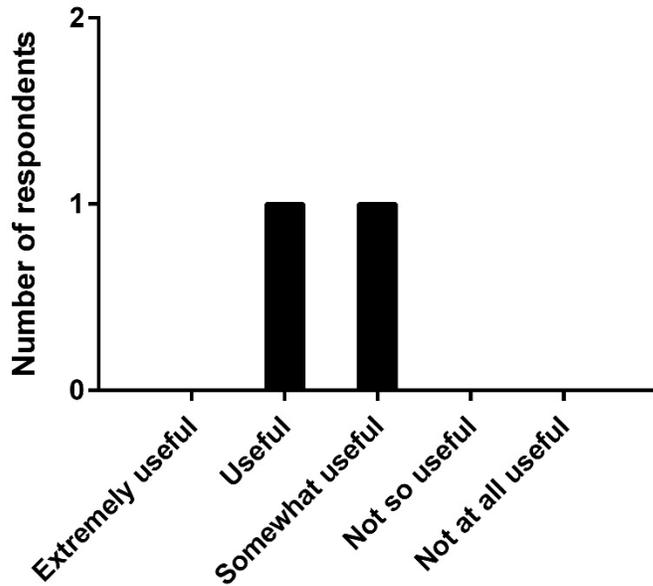
Question 6: If you have used the Irrigation Scheduler, how easy or difficult did you find it to use? (2 answered, 9 skipped)

Very easy; Easy; Neither easy nor difficult; Difficult; Very difficult



Question 7: If you have used the Irrigation Scheduler, how useful were its recommendations: (2 answered, 9 skipped)

Extremely useful; Very useful; Somewhat useful; Not so useful; Not at all useful



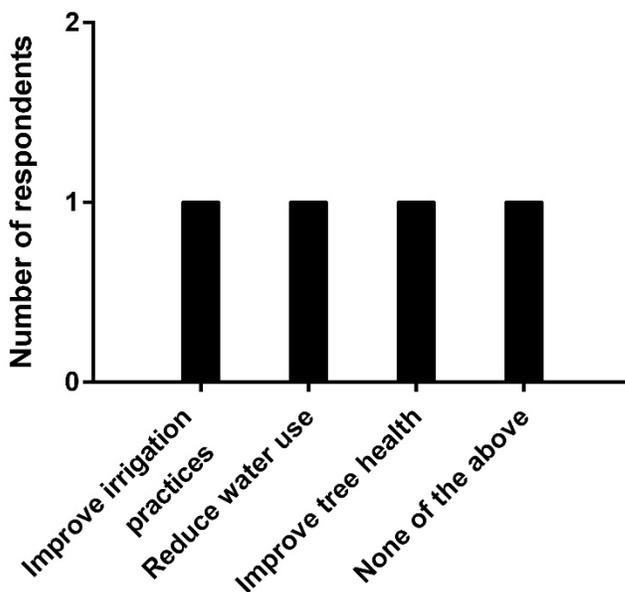
Question 8: If you have used the Irrigation Scheduler, which of these, if any, describe your results? (2 answered, 9 skipped)

The Irrigation Scheduler helped me improve my irrigation practices.

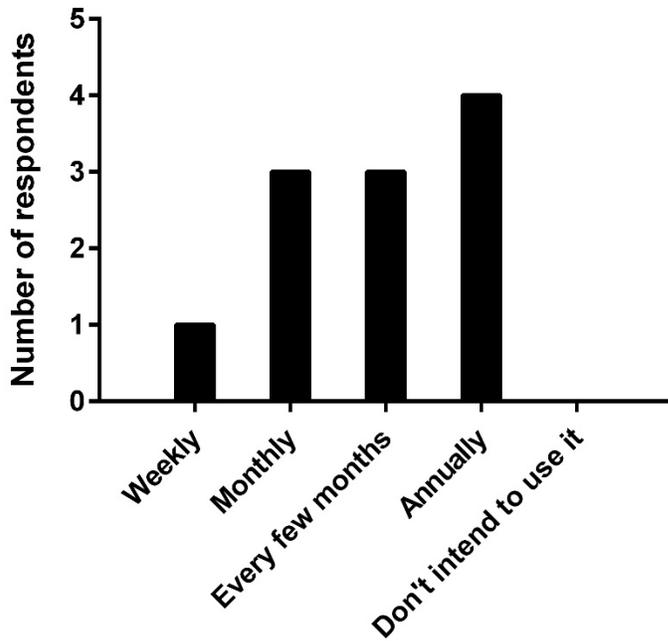
The Irrigation Scheduler helped me reduce my water use.

The Irrigation Scheduler helped improve the health of my trees.

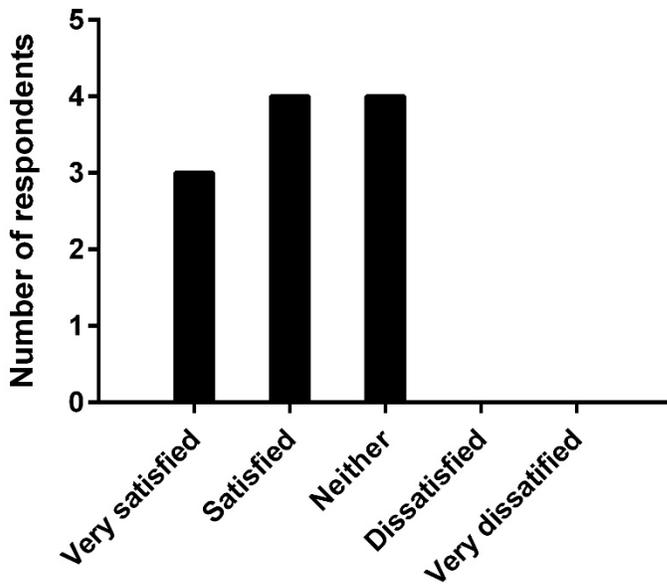
None of the above.



Question 9: How often do you intend to use the Decision Support Tools system? (11 answered, 0 skipped)
Weekly; Monthly; Every few months; Annually; I don't intend to continue using the system



Question 10: What is your overall level of satisfaction with the Decision Support Tools system? (11 answered, 0 skipped)
Very satisfied; Satisfied; Neither satisfied nor dissatisfied; Dissatisfied; Very dissatisfied



Question 11: If you selected dissatisfied or very dissatisfied, please tell us why you are not satisfied with the Decision Support Tools system. (2 answered, 9 skipped)

1. No instructions on how to alleviate nutrient deficiencies. What materials or product should I try?
2. I chose middle of the road. I still struggle with tech stuff. Tim it is great what you have done. I will get my daughter involved.

Question 12: Please share with us any feedback you that you would like us to know about your experience with the Decision Support Tools system. (8 answered, 3 skipped)

1. It would be useful to connect the results of the support tool and a soil analysis. Additionally, fertilizer rate suggestions for avos would help the grower determine if the results are worth the money. The decision tool does not take into account individual soil ph, salinity, base sat., etc.
2. It would be nice to keep prior year data in my account.
3. The yield DST is a powerful tool. Without it, with the exception of nitrogen and zinc, the nutritional recommendation is predicated upon those developed for citrus. I. My analysis the recommendation output from inputting the DST is more credible than relying on those for citrus. Also, through my using the DST I contribute to data acquisition by the data base forming within the DST that through time will provide a basis for the application of artificial intelligence tools that will zero in on more precision bringing even greater validation of the correct individual nutrient levels. I currently use the DST results as the basis of my annual nutritional strategy. I really like the format of the output from the DST. Find it overall very easy to use, with the exception of one step, which is not intuitive, but with some trial and error found a way around it. It is a powerful tool that through time will improve provide the basis of greatly improve the profitability at multiple levels: the grower through to the entire industry. In the grower precisely applying nutrients that is primary in complying with requirements of the clean water act, GMP/GAP, which form the basis of a sustainability strategy (which the trade channel and consumer are increasingly demanding of the avocado industry).
4. It would be even more useful if the rain monitoring station was closer to my location. Using one farther away doesn't give accurate results and I have to "adjust".
5. It is a positive effort at understanding a complex puzzle. We will probably never have a plug and play tool that can be used as a stand alone. Just "hints" and suggestions
6. For me more basic would get me on this CAI Avo Desc Support Tool more
7. same answer as 11 (No instructions on how to alleviate nutrient deficiencies. What materials or product should I try?)
8. It would be useful to have a way to convert the percentage change to pounds per acre. For example, Ca% 1.64 will have a yield impact of -26% does not tell me how much Ca I should add per acre to correct the deficiency.

California Avocado Commission

Project: Avocado Establishment and Production Costs and Profitability Analysis Studies



This proposal contains proprietary and confidential information, ideas, and methodologies of ERA Economics, LLC and shall not be used, disclosed, or reproduced, in whole or in part, for any purpose other than to evaluate this proposal, without the prior written consent of ERA.

Cover Letter

March 27, 2020

Tim Spann, PhD
Research Program Director
California Avocado Commission
12 Mauchly, Suite L
Irvine, California 92618

Subject: Response to CAC Avocado Establishment and Production Costs and Profitability Analysis Studies RFP

Dear Mr. Spann,

ERA Economics (ERA) is pleased to submit this proposal in response to your request to update, modernize, and develop avocado production cost and profitability studies. The proposed effort will develop new production budgets and profitability studies with the primary objectives of: (1) updating budgets to reflect current market conditions, (2) modernizing the budget structure to encompass key factors affecting avocado costs and returns, and (3) developing a framework that is more flexible, user-adjustable, and relevant to the CAC and its members.

This proposal includes a work plan and budget for developing the updated cost and profitability budgets. Our proposed approach leverages our experience and project understanding, emphasizing the following:

1. Expertise conducting primary interviews with growers to identify production and regulatory costs for other commodity associations, state agencies, and agribusiness groups.
2. Familiarity with farming practices, water supply, and production constraints in the San Diego area.
3. Experience developing production cost and profitability studies for a range of commodities in California in a flexible framework that accepts user inputs
4. Ability to distil that cost, economic, and market information into a tool that can be used by growers for planning purposes

Please do not hesitate to contact us if you have any questions concerning this proposal. We look forward to the opportunity to work with you on this interesting and important project.



ERA Economics
Duncan MacEwan, Principal Economist
530-304-1267

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Cover Page RFP Content

This section includes additional content requested in the cover page section of the RFP.

Project Title:

Avocado Production Costs and Profitability Study Updates and User Framework

Timeline:

The estimated timeline is approximately fifteen (15) months. This includes time for scheduling meetings, grower interviews, and data management and analysis.

July 1, 2020 (contract execution) – October 1, 2021

Not-to-Exceed Budget Estimate including all labor and expenses:

\$135,625

Project Leader:

Michael McCullough, PhD. Senior Economist.

Role: Task manager, analysis, and modeling.

Principal-in-Charge:

Duncan MacEwan, PhD. Principal Economist.

Role: Project management and QA/QC.

Project Team:

Brooks Ronspies, M.S. Associate Economist.

Role: Data management, research, model development, and analysis.

Miranda Driver. Research Associate.

Role: Research, data management, and format/delivery.

Jay Noel, PhD. Sr. Principal Economist.

Role: Technical advisor and expert input.

Richard Howitt, PhD. Sr. Principal Economist.

Role: Technical advisor and expert input.

Project Narrative

The following sections define the Project Narrative as specified in the RFP.

Abstract

The California Avocado Commission (CAC) works to maximize avocado grower returns through a variety of marketing and technical activities, including provision of outreach materials used by growers. Current outreach materials include (among others) regional avocado production cost and profitability studies (hereafter, cost studies) that growers and other professionals can use for planning purposes. Historical studies have been developed for four regions and are prepared in pdf format with narratives and hard-coded tables summarizing key measures of cost and profitability. CAC determined that the existing cost studies require updating to: (i) provide more accurate information, (ii) revise/modernize the studies to reflect current best technical practices, and (iii) make the studies more useful (user-friendly and useful) for growers.

ERA Economics (ERA) has prepared this proposal and developed a work plan to prepare a new cost study framework that includes current market information, new features of profitability and risk assessments, and is adjustable by growers in an Excel-based tool. The tool will include embedded formulas and will be reproducible on a web-based platform. In addition, ERA will work with CAC to develop grower outreach materials including a presentation to members and a publication in its quarterly magazine, *From the Grove*.

Work Plan and Methods

The proposed scope of work and associated cost estimate is structured according to the three primary deliverables: (i) grower outreach to update avocado cost of production studies, (ii) develop an interactive cost study tool, (iii) assist CAC in grower outreach. In addition, ERA has included an optional Task to extend the features included in the primary analysis.

Assumptions

The following assumptions apply to the specific tasks listed below:

- In addition to the meetings specified under Task 1, a total of two (2) technical coordination phone meetings between ERA and CAC, up to 2-hours duration each, are included in the specific task budgets.
- Two (2) ERA staff will attend any in person meetings and grower interviews.
- For any deliverables, ERA will provide a draft version, CAC will review and provide one round of synthesized comments on the draft, and ERA will respond to those comments and provide the final deliverable. If there are no comments, the draft will become the final deliverable.
- ERA will provide final deliverables electronically as specified in the Tasks below. Any printing, illustrations, or production costs will be the responsibility of CAC.
- CAC will identify and coordinate scheduling for grower interviews conducted under Task 2. It is assumed that multiple grower interviews will be conducted over the course of two (2) full working days. This may include multiple interviews at CAC offices, or site visits as appropriate. The schedule (2 full working days) includes any travel time required (for example, if on-site meetings in San Diego and Irvine time would need to be included for travel between interviews).

Task 1 – Coordination and Technical Meetings

ERA will participate in a 2-hour virtual kick-off meeting with the CAC. The meeting will occur in the first half of July 2020 and will be planned for ERA to review the work plan with CAC and for CAC to convey to ERA any project conditions, constraints, and related information considered to be relevant to the work plan. ERA will participate in up to three additional 1-hour conference call coordination meetings with CAC to review work plan progress. It is anticipated that the first 2 meetings would discuss preliminary results and progress, and the third meeting would review final project findings. All coordination meetings under this Task will be held via tele/video conference. This Task also includes general project management and administration and developing activity reports for each deliverable (see Milestone Table below).

Deliverables: As appropriate, electronic PowerPoint presentations provided in advance of each meeting. If requested by CAC, summary meeting notes provided electronically.

Task 2 – Data and Grower Interviews

ERA will inventory existing data and conduct preliminary research to develop baseline avocado cost, return, and market information. This will include conducting grower interviews to develop additional data required to develop the cost study framework. It is anticipated that interviews will be conducted in person with growers identified by CAC. ERA will also informally survey local suppliers, as necessary, to get feedback on current production practices, costs, and alternatives.

The following subtasks will be performed by ERA to develop data for the cost study framework:

1. ERA will assemble existing data, using previous CAC production studies, other published studies, and market data. Market data will include standard USDA and State/Federal agency sources in addition to information provided by CAC. All data will be aggregated into a single database. This information will be used as a benchmark for creating the cost study framework.
2. Conduct grower interviews. Based on review of the data developed under Subtask 1.1, and in consultation with CAC, develop criteria for selection of a sample of growers to be interviewed. CAC will identify the final set of growers to be interviewed that are representative of different production methods (e.g. conventional and organic) and practices across production regions. It is assumed that interviews will be held on two (2) days as a full day of meetings (or in person, as required).
 - a. Develop a grower questionnaire (key questions/lines of discussion) focused on the following objectives:
 - i. Identifying capital investments, equipment, costs, and ownership/lease practices. In addition, identifying operating time and share used across different crops/activities on the ranch
 - ii. Identifying current production practices, inputs, and variable unit costs, and to the extent possible, identify key markets conditions.
 - iii. Identifying current agronomic and irrigation practices, applied water rates, and other factors to the extent possible.
 - iv. Assessing the effect of changing policy/regulations and the effect on production decisions, costs identified in (i) – (iii), and key summary outputs and decision variables to include in the cost study framework (see Task 4).
 - b. Conduct grower interviews; document findings in a field note format.
3. Merge and synthesize data developed under Subtasks 1 and 2. Document the findings of Subtasks 1 and 2 in a brief technical memorandum, focusing on key factors and current conditions that support the development of the cost study framework under Task 3.

Deliverables: Brief technical memorandum as described under subtask 1.3 provided electronically as a Word document.

Task 3 – Develop Interactive Cost Study Framework

Develop an interactive framework for the cost and profitability studies (cost studies) that can be modified by the user. It will be developed in Excel and all Excel Workbook formulas will be available to CAC so that

CAC can develop a web-based version of the framework in the future. All initial data will be based on the results of the Task 2 analysis, augmented as described below.

The following subtasks will be performed by ERA:

1. Using the result of Task 2, develop a template for the cost study framework as an Excel Workbook. All unit costs, interest rates, and input quantities will be modifiable by the user and the framework (tool) will automatically update and populate summary tables and results. The workbook will include the following table/sheets:
 - a. Equipment and capital inventory for all outlays, including the estimated cost and useful life; capital costs will be expressed as lump sum payments and amortized using a user-defined interest rate. A separate summary table will include overhead costs including insurance and taxes as specified by the user.
 - b. Annual establishment costs, by year, expressed as lump sum payments and amortized using a user-defined interest rate.
 - c. Production returns including farm-gate prices received and yields; this will include a 10-year historical average or a user-defined input.
 - d. Annual variable input unit costs and quantities, including itemized production inputs; irrigation costs will include water supply, irrigation labor, and (if used by the grower) pumping energy costs (any capital costs are included under item (a) above).
 - e. Average annual profit and loss statement showing itemized production costs, amortized capital cost, and a summary of net return.
2. Develop a brief user-guide for the Excel Workbook developed under Subtask 3.1. The user guide will be developed for the dual-purpose of explaining to CAC or its members how to change inputs and interpret outputs, and briefly documenting the underlying data, assumptions, capabilities, and limitations. The user guide will be a brief, concise summary. It will not include a longer narrative about production practices and market conditions that are typically included in UC Cooperative Extension crop budgets (including existing CAC cost studies).

Deliverables: Excel Workbook framework as described under Subtask 3.1. Brief user manual as described under Subtask 3.2.

Task 4 – Grower Reports, Profitability, and Trend Analysis

Using the cost study framework developed under Task 3 and feedback from grower interviews under Task 4, ERA will develop a series of financial output summary measures in the cost study framework. The Excel Workbook developed under Task 3 will be extended to include these measures and all formulas will be reviewable by CAC.

The following subtasks will be performed by ERA:

1. Develop historical trend tables for prices and yields as input data to the cost study framework Excel Workbook, including 10 to 20 years of historical data. Develop formulas for fitting trends and statistical distributions to the data and generate summary figures illustrating recent trends.

2. Based on the grower interview feedback under Task 1, develop grower report summary tables and figures in the Excel Workbook. All tables and figures will automatically update based on user inputs. These will include:
 - a. Historical, moving-average, and trends in export and domestic market movement, price, yield, and gross revenue
 - b. Plot of net return over operating cost and trends over time; allow user to define inputs for prices
 - c. Plot of forecasted, 5-year, net return over operating cost based on user-defined inputs for: (i) expected average annual % increase in production costs, and (ii) strong/average/weak market conditions.
3. Develop a profitability analysis summary in the Excel Workbook. This will be presented as a ranging analysis that shows profitability measures over a range of user-definable inputs: (i) costs and (ii) returns (price received). Profitability measures will be developed on individual sheets that are linked to other formulas and data in the Workbook and will include:
 - a. Net return over operating cost. This is a standard measure of average annual return and will be shown in tabular form as a range of per unit returns over user defined inputs. The ranging analysis will include a break-even calculation that will show break-even gross returns required to cover operating costs.
 - b. Net return over operating cost risk analysis. Fit a statistical distribution to the Subtask 4.1 price and yield data. Develop a risk analysis that calculates the probability of covering operating costs, and the probability of covering total costs, based on historical trends in price and yield. Allow user-defined inputs for changes in operating costs, prices, and yields, and illustrate the effect on ability to cover operating costs.
 - c. Financial summary cash flow statement. Using the results of Task 3 and Subtasks 4.1 – 4.3, develop a summary sheet in the Excel Workbook showing the cash flow measure of profitability. As a default, this will be developed assuming establishment of a new orchard. The user will be able to define inputs to tailor the statement to specific operations.
4. Update the brief user-guide for the Excel Workbook developed under Subtask 3.1. Briefly summarize the inputs, outputs, and user features included in Subtasks 4.1 – 4.3.

Deliverables: Updated Excel Workbook framework as described under Subtasks 4.1 – 4.3. Updated brief user manual as described under Subtask 4.4.

Task 5 – Project Outreach

In addition to the outreach conducted under Subtask 2.2, ERA will work with CAC to engage its members to explain the results of the analysis, highlight value to the industry, and identify potential ways to extend the analysis to maximize industry and policy impacts.

The following subtasks will be performed by ERA:

1. Develop content and host one 4-hour training workshop on use of the cost study framework developed under Tasks 3 and 4. CAC will be responsible for managing attendees and all logistical aspects of the workshop. ERA will be responsible for preparing the agenda and all technical content. It is assumed the workshop will be held at CAC offices, or a nearby location, in Irvine, CA.
2. Develop one (1) article for publication in *From the Grove*. The article will describe the project approach and results and will apply the framework to a current policy example (to be defined in coordination with CAC) to illustrate how it can be applied to evaluate current industry issues. The article will be written for an industry audience.
3. ERA will participate in up to two (2) annual Production Research Committee Presentations in person at CAC offices in Irvine, CA.

Deliverables: Workshop agenda, PowerPoint, and technical content as described under Subtask 5.1, provided electronically. Article manuscript as described under Subtask 5.2, provided electronically. Subtask 5.3 meeting materials provided electronically.

Milestone Table

Project milestones are tied to the deliverables specified in the work plan. Each deliverable specified in the work plan will be accompanied by a brief, ½ page, activity report that concisely summarizes work performed. The table also summarizes the estimated not-to-exceed budget for each Task. The build-up of ERA labor and direct costs underlying the Task costs is shown in the following section (Budget).

Table 1. Project Milestone and Budget Summary

Task	Deliverable Summary	Estimated Final Deliverable Date (Tasks Include Multiple Deliverables)	Cost Estimate
1	Meeting agendas; notes	Through project completion, 10/1/21	\$14,500
2	Grower interviews; data; summary memorandum	2/28/21	\$27,105
3	Interactive cost study workbook and documentation	4/30/21	\$34,950
4	Updated interactive cost study workbook, profitability analysis, documentation	7/1/21	\$31,780
5	Workshop materials, article manuscript; Production Research Committee	10/1/21	\$27,290

Budget

ERA Economics has prepared a cost estimate based on the deliverables specified in the associated Work Plan. ERA will meet with the CAC to review the proposed project scope, refine the project, and develop a final scope of work and cost estimate.

Fully loaded rates include all salary and overhead costs including equipment. Any direct costs are identified in the cost proposal, and include airfare, rental cars, travel, and meals while on travel. All expenses are billed at cost with no mark-up.

CAC fiscal year runs 11/1 – 10/31. ERA estimates that approximately 50% of contract cost would be incurred in the current FY, and remaining costs in the next FY.

[Table 1. Cost Estimate on the following page]

Project Element/Task/Subtask	Labor Classifications/Costs					Labor Costs Subtotal (\$)	Direct Costs			Direct Costs Subtotal (\$)	Total Cost (\$)	
	Sr. Principal Economist	Principal Economist	Senior Economist	Associate Economist	Research Associate		Mileage (\$ / mile)	Meals (\$ / person / day)	Other Direct Costs			
									Rates			
									\$225			\$195
Project Element/Task/Subtask												
Task 1 - Coordination and Technical Meetings												
1.1 Project management and coordination	4	8	40	24	20	\$14,500				\$14,500		
Task 1 Subtotals	4	8	40	24	20	\$14,500				\$14,500		
Task 2 - Data and Grower Interviews												
2.1 Baseline data			20	32		\$7,620				\$7,620		
2.2 Grower interviews		24	32	24		\$13,200	100	4	\$980	\$14,235		
2.3 Summarize results and prepare memorandum	2		16	16		\$5,250				\$5,250		
Task 2 Subtotals	2	24	68	72		\$26,070	\$55	\$100	\$880	\$27,105		
Task 3 - Develop Cost Study Framework												
3.1 Cost study interactive Excel Workbook		12	60	80	60	\$29,640				\$29,640		
3.2 Develop documentation/user guide	2	8	20			\$5,310				\$5,310		
Task 3 Subtotals	2	20	80	80	60	\$34,950				\$34,950		
Task 4 - Grower Reports, Profitability, and Trend Analysis												
4.1 Historical data tables			2	8		\$1,410				\$1,410		
4.2 Update cost study interactive Excel Workbook	2		12	32		\$6,750				\$6,750		
4.3 Develop profitability analysis	4	4	48	60	32	\$21,220				\$21,220		
4.4 Update documentation/user guide			8	8		\$2,400				\$2,400		
Task 4 Subtotals	6	4	70	108	32	\$31,780				\$31,780		
Task 5 - Project Outreach												
5.1 Training workshop	4		32	24	12	\$10,740		4	\$440	\$540		
5.2 Article manuscript	2	4	12	16		\$5,370				\$5,370		
5.3 Production Research Committee presentation (2x)		16	20	24		\$9,660		4	880	\$980		
Task 5 Subtotals	6	20	64	64	12	\$25,770		\$200	\$1,320	\$1,520		
Totals	20	76	322	348	124	\$133,070	\$55	\$300	\$2,200	\$2,555		
										\$135,625		

Appendix: Project Leaders

The project team includes input from 6 professionals from ERA Economics. Each team member brings unique expertise to the project. Resumes for ERA staff and a brief description of the firm are included on the following pages.

ERA Economics Qualifications

Located in Davis, CA, ERA Economics specializes in the economics of water resources and agriculture. The firm was founded in 2013 on a simple principle of providing insightful economic analysis to agricultural enterprises and water users in California. Having grown from 2 partners to the current team of 7 professionals, ERA's services include feasibility studies, commodity valuation and risk assessments, fiscal and economic impact analyses, and policy evaluation. Members of ERA's team have worked on California water and agriculture for over three decades, and understand how economics integrates with other business, technical, and legal analyses to support effective water supply and agricultural business planning decisions.

The ERA team works with a range of agency and private clients on problems related to water resources and agriculture in California and the Western U.S. ERA's professionals are at the forefront of developing applied regional economic models that form the basis of agricultural economic assessments. This includes the Statewide Agricultural Production Model (SWAP), which is linked to local and state (Department of Water Resources) water operations and groundwater hydrology models. Our data-driven approach to economic analysis provides a solid foundation for assessing economic and social impacts and supports development of economically motivated business decisions.

Jay Noel, Ph.D.

Sr. Principal Economist, ERA Economics

Bio: Jay is a principal at ERA Economics and professor emeritus in the Agribusiness Department at California Polytechnic State University. He previously served as the Director of the California Institute for the Study of Specialty Crops and as the Chief Operating Officer of RGA. Jay has several decades of experience in the agriculture and specialty crop policy analysis, agribusiness strategic management, food supply chain risk management, and regulatory risk analysis. He has prepared numerous reports and made presentations on issues such as specialty crop transportation, agricultural risk and uncertainty, regulatory impacts on agricultural profitability, and agribusiness management.

Education

Ph.D., Agricultural Economics, University of California Davis

M.S., Agricultural Economics, University of California Davis

B.S., Soil and Water Science, University of California Davis

Professional Memberships

American Agricultural Economics Association (AAEA)

Western Agricultural Economics Association

Selected Projects

Processing Tomato Industry Baseline Analysis, California Tomato Growers Association, Sacramento, CA. 2018 - Present. Jay is the technical advisor for an assessment of the processing tomato industry costs, returns, markets, and market potential. The analysis was commissioned by the Association due to significant cost, price, and regulatory pressure faced by the industry. The study includes establishing production cost, regulatory costs, and returns under current and future market conditions. A second phase of the analysis was developed to evaluate domestic and international market trends for tomato products.

San Joaquin Valley Agriculture Regulatory Impact Analysis, California Air Resources Board (CARB) Sacramento, CA. 2014-2019. Jay led an assessment of the regulatory compliance costs for specialty crops producers under new air emission standards in the San Joaquin Valley. His project team at ERA has developed an integrated modeling framework which CARB can use to assess the economic impacts of increased regulatory costs. The economic decision support framework can assess the fiscal impacts and total impacts of new regulations at the farm, local, and statewide levels.

Economic Impact Analysis of Proposed Pesticide Regulations, Pyrethroids Working Group, Sacramento, CA, 2017. The Pyrethroids Working Group (a consortium of agri-chemical companies) engaged ERA Economics to complete a multi-part study to quantify the economic value that pyrethroid insecticides provide to California specialty crop farmers. Jay was the senior advisor for assessing the cost of the proposed regulation to stakeholders.

Michael McCullough, Ph.D.

Sr. Economist, ERA Economics



Bio: Mike is a senior economist with ERA Economics specializing in agricultural economics. He concurrently holds a position as Professor in the Agribusiness Department at Cal Poly San Luis Obispo. Mike has worked on a range of agricultural cost studies for private and agency clients across California. This includes grower interviews to develop production cost studies and assess regulatory costs. Mike has published extensively on the effect of regulations on farm profitability and competitiveness. Mike hails from Idaho and completed his undergraduate and graduate work at Boise State and Washington State University, before moving to California and spending the last 15 years working on agricultural issues in California.

Education

Ph.D., Economics, Washington State University

M.S., Statistics, Washington State University

B.S., Economics and Applied Mathematics, Boise State

Professional Memberships

American Agricultural Economics Association

Western Agricultural Economics Association

Selected Projects

San Joaquin Valley Agriculture Regulatory Impact Analysis, California Air Resources Board Sacramento, CA. 2014-2017. Mike led an assessment of the regulatory compliance costs for specialty crops producers under new air emission standards in the San Joaquin Valley. Working with a project team at ERA, he developed an integrated modelling framework which CARB can use to assess the economic impacts of increased regulatory costs. The economic decision support framework can assess the fiscal impacts and total impacts of new regulations at the farm, local, and state-wide levels.

San Joaquin Valley Agriculture SGMA Impacts, CA Strategic Growth Council, CA. 2018-Present. Mike is developing an assessment of the effect of increasing water supply costs and water scarcity under the Sustainable Groundwater Management Act (SGMA) on San Joaquin Valley agriculture. The project is assessing direct impacts to producers as well as indirect and induced impacts to related industries. He is currently working on a grower survey and outreach effort to establish baseline industry data, including working with dairies in the Tule Subbasin. The economic analysis will assess the fiscal impacts and total impacts of SGMA in the Tule Subbasin.

San Joaquin Valley Agriculture Production Cost Update, California Air Resources Board Sacramento, CA. 2019-Present. Mike is leading an update of grower production costs (case-studies) used to assess the regulatory compliance costs for specialty crops producers under new air emission standards in the San Joaquin Valley. Mike is conducting interviews with growers across the San Joaquin Valley to develop crop production budgets, regulatory costs, and assess how those factors change as regulations continue to increase. Preliminary results have been presented at various stakeholder meetings.

Duncan MacEwan, Ph.D.
Principal Economist, ERA Economics

Bio: Duncan is the managing partner of ERA Economics. He previously worked as a consultant economist with CH2M (now Jacobs) and concurrently held a position as a postdoctoral scholar in the Department of Agricultural and Resource Economics at the University of California at Davis. He is a primary developer of the Statewide Agricultural Production Model (SWAP) and has worked with clients to evaluate local, state, and federal water resource policies using similar economic modeling frameworks. Duncan is currently the lead economist on four Groundwater Sustainability Plans in critically overdraft subbasins in the San Joaquin Valley and high priority subbasins in the Sacramento Valley.

Education

Ph.D., Economic Geography, University of California Davis

M.S., Agricultural and Resource Economics, University of California Davis

B.S., Mathematical Economics and Applied Math, California State University Long Beach

Professional Memberships

American Agricultural and Applied Economics Association

Western Agricultural Economics Association

Selected Projects

Crop and Water Risk Assessments. Farm Credit West. California. 2017 - Present. Farm Credit West engaged ERA Economics to develop regional crop market assessments and water risk evaluations. Water risk assessments establish water costs, value, and risk under current and projected future availability of irrigation water supply to agricultural regions in California, including projected implementation of the Sustainable Groundwater Management Act (SGMA). Commodity risk assessments are based on forecasts (econometric analyses) of market trends, prices, and returns for key California crops. The studies are used to manage portfolio risk, and to provide market insights for customers (growers).

Pyrethroid Benefit Assessment. Pyrethroid Working Group. Sacramento, CA, 2016 – 2017. Duncan developed an economic benefits analysis to establish the value of pyrethroid insecticides for major California crops. The analysis established average annual farm-gate benefits exceed \$1 billion. The results of the analysis were presented to CA Department of Pesticide Regulation (DPR) staff. The study was used to inform DPR about the economic importance of insect management, and the potential farm impacts of restricting access to insecticides for which there are no viable alternatives.

Groundwater Sustainability Plan (GSP) Development, Chowchilla and Madera Subbasins, Madera County, CA, 2017 - Present. Duncan is the lead economist on the Madera and Chowchilla Subbasin GSPs. The GSP consultant team is working with stakeholders to develop a set of projects and management actions that when fully implemented result in a cost-effective sustainable groundwater condition in the subbasin. Duncan has developed an economic analysis of subbasin agriculture and water use that is linked to the Subbasin HCM and GSA water budgets. He developed economic impact analyses to evaluate potential projects and management actions and support broader GSP development.

Richard E. Howitt, Ph.D.

Sr. Principal Economist, ERA Economics

Bio: Richard is a founding partner of ERA Economics and professor emeritus in the Department of Agricultural and Resource Economics at the University of California Davis. He has more than four decades of experience in agricultural, resource, and environmental economics and has provided consulting expertise for numerous water and agriculture projects, for litigation and policy analysis. Richard has extensive experience working with federal, state, and local agencies to convey complex economic issues to a broad audience. He is a leader in the development of economic optimization methods and calibrated models that are used to evaluate the changes in resource availability and market conditions for agriculture. He has advised a range of private and government clients, domestically and internationally, on resource management at a range of scales.

Education

Ph.D., Agricultural Economics, University of California Davis

M.S., Agricultural Economics, University of California Davis

B.S., Agricultural Economics, Oregon State University

Professional Memberships

American Agricultural Economics Association, Fellow (2009)

Western Agricultural Economics Association

Australian Agricultural & Resource Economics Society

Selected Projects

Financial Analysis of the Santa Clara Valley Water District's Open Space Credit, Santa Clara Valley Water District, San Jose, CA. 2013. Richard led a study to assess the fiscal costs and benefits of changing the Open Space Credit (agricultural groundwater pumping charge) in the Santa Clara Valley Water District. The study analyzed Santa Clara County agriculture to assess the incremental cost to growers from a potential increase in the groundwater charge. Recommendations were presented to the District Board and agricultural stakeholders. The Board decided to leave the groundwater charge unchanged.

Agribusiness Acquisition Proposal Risk Review, Confidential Client, Dallas, TX. 2016. Richard led an investigation of a proposed \$500 million purchase of a grower-packer-shipper operation located on the east-side of the San Joaquin Valley. The study involved reviewing financial records and performing an independent risk assessment that included short and long-term water supply reliability risk. The results of the study were presented to the potential investors, and the investors ultimately decided not to move forward with the acquisition.

Economic Multiplier Analysis of Specialty Crop Agriculture in the Sacramento Area, SACOG, Sacramento, CA, 2015 – 2016. Richard was technical advisor for a team of economists at ERA to develop an integrated modeling framework to assess the total value of specialty crop agriculture in the Sacramento area. Results include jobs, taxes, and regional value added from production.

Brooks Ronspies, MS

Associate Economist, ERA Economics

Bio: Brooks is an associate economist with ERA Economics. Brooks graduated with a Masters in Agricultural Economics from the University of Nebraska-Lincoln. His thesis evaluated producer motivations for adoption of nitrogen sensing technology. Brooks has previously worked as a research assistant for faculty at the University of Nebraska-Lincoln and as an intern at the Federal Reserve Bank of Kansas City. At ERA he is responsible for data management, analysis, and project execution for a range of economic assessments.

Education

M.S., Agricultural Economics, University of Nebraska-Lincoln

B.S., Natural Resource Economics, University of Nebraska-Lincoln

Professional Experience

Associate Economist, ERA Economics, 2019 – Present

Intern, Federal Reserve Bank of Kansas City, 2018

Intern, B2 Environmental, 2016

Data Intern, Rural Futures Institute, 2014

Professional Memberships

Agricultural and Applied Economics Association

Selected Projects

Cuyama Subbasin Economic Impact Analysis, Cuyama Basin GSA, Cuyama Valley, CA, 2019 - Present.

Brooks is working with senior economists at ERA to prepare an economic impact analysis of the Cuyama Subbasin Groundwater Sustainability Plan (GSP). The Cuyama Subbasin is critically overdrafted. The GSP specifies a series of project and management actions to achieve and maintain sustainable groundwater conditions. Brooks developed data and model code for a calibrated economic optimization model of Cuyama Subbasin agriculture and water use. He is developing an economic impact analysis for the Cuyama Basin GSA.

Water Supply Valuation, Confidential Client, California. Brooks is working with senior economists at ERA to develop regional estimates of the value of irrigation water under current and future conditions in California. The analysis is being used to support the client in evaluating an asset acquisition proposal, and for its internal strategic planning purposes. Brooks is responsible for developing crop production budgets and data input files for economic models developed by other members of the ERA team.

Confidential Fumigant Economic Benefit Analysis, Confidential Client, 2019 - Present. Brooks is working with senior economists at ERA to prepare an economic benefits assessment that establishes the value of a fumigant to agricultural producers in California. The analysis includes assessing direct and indirect economic benefits using an avoided-cost analysis approach. Economic benefits are expressed in terms of revenue, jobs, and value-added to the California economy.

Miranda Driver

Research Associate, ERA Economics



Bio: Miranda is a communications professional based in the Sacramento area with strong ties to the agricultural community. Miranda and her husband are the 5th generation living and working on their family's diversified rice and walnut farm in the Sutter Basin. Miranda has worked with a wide variety of agriculture organizations and has an in depth understanding of the unique requirements for marketing to, and for, agriculture companies. In addition to her position at ERA, Miranda develops and maintains the CalAgJobs website: a one-stop resource for agricultural jobs and recruiting. At ERA she assists with document management, formatting, design, and delivery

Education

B.S., Applied Computer Graphics, California State University, Chico

Professional Experience

Staff Consultant, ERA Economics, 2015 – Present

Marketing and Communications Director, CalAgJobs.com, 2013 – Present

Freelance Design and Marketing Consultant, 2010 – Present

Social Media Coordinator, CA Tobacco Control Program, California Dept. of Public Health, 2014

Program Coordinator, Marketing and Member Relations, California Farm Bureau Federation, 2013

Program Assistant, Marketing and Member Relations, California Farm Bureau Federation, 2010 – 12

Professional Memberships

Yolo County Farm Bureau, 2010 – Present,

Yolo County Young Farmers and Ranchers, 2010-Present

Activities Chairman, Yolo County Young Farmers and Ranchers 2015 – 2016

Selected Projects

Herbicide Benefit Assessment. Confidential Client, Sacramento, CA, 2018. The California Department of Pesticide Regulation (DPR) initiated an investigation of a pre-emergent herbicide. Miranda was responsible for grower outreach and crop budget development to support an economic benefits analysis of the value that the herbicide provides to California growers and linked agribusiness industries. The analysis quantified direct, indirect, and risk value to California growers and linked agribusinesses. Miranda surveyed growers and developed farm budget economic models used to quantify the total value of Dacthal benefits in California. She assisted in preparing the summary report and presentation materials to DPR.

MAURCSA (SB 94) Standardized Economic Impact Assessment (SRIA), California Department of Food and Agriculture, Sacramento, CA, 2016 – Present. Miranda assisted in a comprehensive cannabis cultivator outreach for the SRIA, and data management. This included outreach to local, state, and federal agencies to compile production data, data cleaning and analysis. She is currently leading the document formatting and working with senior ERA staff to develop the revised SRIA.



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March 13, 2020

California Avocado Commission
12 Mauchly, Suite L
Irvine, CA 92618-6305

“Avocado Budget Modernization and Grower Budgeting Tools”

University of California, Davis PI: Karen Jetter

Dear Tim Spann:

On behalf of The Regents of the University of California, Davis campus, it is a pleasure to present for the California Avocado Commission’s consideration the proposal referenced above. Please note that should the proposal be selected for funding, any non-compliance with applicable policy will need to be addressed as a condition of accepting the award.

Please contact me with any administrative questions. We request correspondence pertaining to this proposal be sent via email to proposals@ucdavis.edu or mailed to the Office of Research Sponsored Programs Office, 1850 Research Park Drive, Suite 300 Davis, CA 95618-6153.

We look forward to working with you on this important project.

Sincerely,

A handwritten signature in blue ink that reads "Daniel Cordes".

Daniel Cordes
Contracts and Grants Analyst

Please refer to Proposal No: 20-3570 on all future correspondence.

Project Title: Avocado Budget Modernization and Grower Budgeting Tools.

Project Leader: Karen Jetter, Associate Research Economist,
University of California Agricultural Issues Center
1 Shields Ave, Davis, CA 95616
530-754-8756, jetter@primal.ucdavis.edu

Co-Investigators: Donald Stewart, Staff Research Associate
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Project Duration: 7/1/20 – 12/31/20.

Total project budget: \$61,106

PROJECT SUMMARY

Abstract

This project will update the avocado establishment and production costs, and profitability analysis budgets that were last completed in 2011. It will use the same program, Budget Planner, that was used to prepare the previous budgets; however, budget preparation will be updated in two important ways. The first is by analyzing pesticide use report data to determine which pesticides are applied when and linking this to specific pests. The second is by creating one budget with conversion factors for key variables in different counties. In addition, this project, will develop templates that can be used for a partial budget analysis by growers.

Work plan and methods

The first part of this project will update and expand the Avocado Sample Establishment and Production Costs and Profitability Analysis budgets last completed in 2011. These budgets were completed for two regions: Southeast Interior and South Coast (Riverside and San Diego Counties) and the Central Coast (Ventura, San Luis Obispo and Santa Barbara Counties). For each region the costs of two different production systems (conventional and organic) were completed. This study will expand the analysis by working with the California Avocado Commission to modernize the avocado budgets and develop one budget with “correction factors” for each county. The previous budgets were prepared using the Budget Planner program, developed by Dr. Karen Klonsky, a Cooperative Extension Specialist with the UC Davis Department of Agricultural and Resource Economics, and Budget Planner will again be used for this analysis. Since its development in the mid-1990s, thousands of unique budgets have been prepared on California crops, dairy, rangeland and nursery industries.

The second project will be to develop templates that growers can use to complete partial budget analyses. With a partial budget analysis, only those costs directly related to a change in cultural practice are analyzed. For example, a partial budget analysis may be done to estimate the change in pest management costs when there is a newly introduced pest that affects avocado production. A partial budget approach is being proposed as the effort involved to decompose all the windows, databases and programs used in the Budget Planner program and recompose it with all features will involve substantial labor and costs. To ensure that the tool has relevancy to growers, growers will be solicited on needs and expected usage.

Costs and Returns Studies, Data Collection and Compilation;

Updating and modernizing the avocado budgets begins with an analysis of the Pesticide Use Reports (PUR) compiled by the California Department of Pesticide Regulation (DPR). The PUR database is a record of all commercial agricultural pesticide applications in California. Reports

are filed monthly with PDR by County Agricultural Commissioners, and an annual database released. Data are available on fumigants, fungicides, insecticides, herbicides and adjuvants. Records include information on the site treated (i.e. crop type, urban application, treatment in a water body, etc.), site location (county, township, etc.), date of treatment, pounds of active ingredient applied, acres treated, and pesticide used. Additional files are available on pesticide characteristics such as biopesticide, Bt application, organophosphate, etc. At this time; however, no data are available on whether the pesticide is certified for use in organic production. The information on whether a pesticide is certified for organic agriculture can be found on the pesticide product label however. A database base of pesticide labels (<http://www.cdms.net/LabelsSDS/home/>) will be searched for the information on organic usage.

The analysis of the pesticide use data then consists of calculating the average pounds applied of active ingredient, and the average acreage treated between 2015 and 2017 (the last date the PUR database is currently available). Averages will be estimated by county, month, pesticide applied, and whether the pesticide is organic or conventional. Jetter and Stewart will complete this part of the analysis.

Once data are available on pesticide treatments, modifying an existing production cost study then involves a meeting among UC farm advisors, farmers, industry representatives and research staff from the Agricultural Issues Center, (AIC). Farmers, agricultural support companies and agricultural advisors provide the ARE staff person with production details, such as: 1) current size of a typical orchard, 2) what operations are performed and what month they occur, 3) materials used for cultural practices such as seeds, water applications, and fertilizers, and 4) what, if any, custom services are hired, such as spraying and harvesting. All will complete this part of the analysis, with Stewart leading.

During this initial meeting the analysis of the PUR data will also be discussed. The PUR data do not include which pest was treated. Only the type of pesticide that was applied and when it was applied is recorded. Growers, UCCE advisors, industry representatives and pest control advisors will be consulted during the initial meeting to determine the correspondence between observed treatments and pests treated. All will complete this part of the analysis, with Jetter leading.

Finally, costs will need to be updated for each county. Some costs, such as the current cost of machinery and labor costs are regularly updated by UC AIC staff. Other costs, such as the price of pesticides, vary by county. As stated in the call for proposals these costs will be provided by the CAC. The CAC will provide a base line cost, with correction factors for each county as applicable.

All of the information is then entered into the computer program Budget Planner, which calculates costs and returns based on standardized economic and engineering formulas. The narrative section is included with each study that compiles and describes the information gathered from the PUR analysis and at the initial data collection meeting, and is written in

collaboration with the participating farm advisors. The draft of the study is sent out to contributing advisors, industry representatives and selected growers for review and is modified and edited based on their feedback. Stewart will complete the budgets with all collaborating on the editing and review.

A consideration: The call for proposals requests one budget, with correction factors for each county. It may be that there will be a sufficient number of differences between counties that in reality regional budgets will be created. For example, inland Riverside is likely to be much hotter than coastal Santa Barbara, necessitating more applications of water. Grove densities in hilly counties may be different than grove densities in flat lands. It may be clearer to create separate budgets and capture similar methods across regions, using correction factors for prices, instead of creating one budget. In this case an additional summary report comparing and contrasting the significant differences by region or county, and costs, can then be prepared. Jetter and Stewart will complete this, with input from collaborators.

Partial Budgeting templates

The call for proposals requests the templates used to develop the budgets. Providing templates of Budget Planner at this time will be very expensive. Budget planner works by bringing up a window where a farm operation is inputted. Different pull-down menus are used to enter equipment and materials. These items are in turn linked to databases and equations that estimate economic variables such as depreciation, cost of fuel usage, maintenance costs, labor costs, etc. These files are in turn linked to price databases. Providing this in workable templates will require a significant and lengthy deconstruction of the program, and reconstruction of the program in Excel.

It is also unclear whether such an undertaking is necessary for the questions that growers, who will be using the programming, want answered. For example, in a previous project on the costs of the spread of the Asian citrus psyllid (ACP) on grower insecticide costs, an on-line tool for citrus growers for them to compare costs (with spaces for them to input their own costs) of different ACP treatments was developed. When the tool was shown to growers the response was “We would just ask the local PCA because we’ll need the latest recommendations and prices. Once the PCA provides that information we don’t need to use an on-line tool.”

We propose instead to create a partial budgeting template that growers could use to compare the direct costs of different, annual, cultural activities such as pest treatments, or changes in labor costs. Partial budgeting is simply a method of organizing experimental data and information about the costs and benefits of various alternative treatments on an annual basis (Kay et al. 2004). This method compares just the changes in income and expenses that would result from implementing a specific alternative; hence it provides an indicator as to how the treatment is likely to affect the profitability of an enterprise. Partial budgeting requires both the calculation of

the changes in revenues and production costs resulting from the implementation of the proposed activity.

An on-line excel worksheet based on data generated by Budget Planner (see https://coststudies.ucdavis.edu/en/archived/year/2006/pears_northcoast_2006_pr_nc_06.xls for an example) will be modified to be relevant for avocado grower needs. For example, the current tool does not breakdown costs such as labor into its components of time spent completing a task and the cost of labor. It provides only the total labor cost per acre to complete a task. The revised tool will allow growers to change a cost, such as a wage rate, and automatically update the total costs (such as total labor costs). To ensure that modifications to the existing tool are relevant, greater knowledge of how growers will use the tool is needed. During the initial meeting with growers, UCCE, industry representatives and UC AIC staff, a discussion on the components growers would like to have for on-line tool will be included. The output in the current excel templates includes the budget costs, and a ranging analysis on profitability. Jetter will complete this part of the project with input from all collaborators.

A consideration: It is possible that during the collaborative discussion growers will express an interest that falls into an analysis of a current economic concern. For example, California minimum hourly wages are increasing annually until they reach \$15/hour in 2024. This will make the labor costs in the 2020 budget outdated for 2021. However, an analysis of the changes in total labor costs, holding all other variables constant, can be completed by the AIC staff using budget planner to provide the avocado industry with an estimate of changes in costs through 2024 as labor costs increase. Whether to do this analysis and/or other analyses will be discussed during the initial collaborate meeting.

Once the tool is developed it will be Beta tested with select growers chosen during the initial collaborative meeting. The tool will then be edited and modified. Jetter will lead this part of the project, with support from Stewart.

Project Outreach

Costs and Returns Studies, Partial Budgeting Template, Outreach

The finished studies and partial budgeting template for avocados will be posted on the UC Davis Department of Agricultural and Resource Economics (UCD Ag econ) website for release to the public. Clients for the studies have traditionally been, and still are, farmers and lending institutions. Many growers examining new enterprises look over cost studies to see what will fit into their operation and available resources. Bankers and other lenders consider the studies to be an accurate estimation of production costs and returns, provided by a neutral third party, and gauge a loan request using them.

Federal and state agencies have used the studies as informational resources to develop policies for pesticide regulations, water use, particulate matter pollution, immigration labor requirements,

federal water projects and natural resource protection. Agricultural industry groups have also used the data in crop budgets in their efforts to support maintenance and special use of certain pesticides and to lobby for various legislative changes. Some studies have been used by both producer groups and processors in negotiations over contract prices of commodities. The Studies are also used by insurance companies, lawyers, advocacy groups, land use planners, assessors, consultants, and auditors. Finally, the studies are useful as an input into further research. Researchers from universities in many other states request studies for research on crops grown in their state.

Costs and Returns Studies, Accessibility;

Demand for the studies is high. Over 3,600 cost studies are available on the website. In 2019, 41,048 studies were downloaded from the cost studies website. The newest cost studies are available on the internet as downloadable files at: coststudies.ucdavis.edu/en/. Also available on the website are; Archived Cost and Returns Studies, The Tree and Vine Loss Calculator, Cow/Calf Budget Calculator and Conservation Practice Studies.

Publications

We anticipate a number of publications as a result of this study. The first will be a research brief summarizing and comparing the use of conventional versus organic pesticides over the near future and by county. This will be submitted for publication in “From the Grove.” The budgets will be published as described above. Finally, a research brief comparing avocado production by county will be submitted to “From the Grove.”

Milestone Timeline

<u>Task</u>	<u>Date</u>
Analyze PUR data	July – August 2020
Organize initial collaborative meetings	July – August 2020
Hold initial collaborative meetings	August 2020
Revise budgets	September 2020
Develop partial budgeting template	September – October 2020
Hold second collaborative meeting to review budgets and template	November 2020
Revise budgets and templates	November – December 2020
Provide budgets and partial budgeting template to CAC	December 2020
Post budgets and templates on UC website.	December 2020
Prepare outreach documents for CAC publication.	

Budget

Salaries	\$32,921
Benefits	<u>\$17,329</u>
Total salaries and benefits	\$50,260
Travel	\$10,846
Total all expenses	\$61,106

Salary is requested for the PI, Karen Jetter, and co-PI, Donald Stewart. Jetter will be responsible for the overall project, lead the analysis of the PUR data, develop the partial budgeting template, and prepare research briefs for the CAC publication "From the Grove". Stewart will be responsible for preparing the updated budgets.

Budget Justification

Other expenses: Identify and explain any other expenses not included in the categories above.

Overall Budget Period One and Period Two – 7/01/2020 to 12/31/2020: \$61,106.

Personnel for Period One – 7/01/2020 to 10/31/2020 to Include: 0.00% Indirect Cost Rate

Karen M. Jetter, Principle Investigator – 45% Commitment for Period One

Wages:	\$14,523.00
Benefits:	<u>\$6,492.00</u>
Total:	\$21,015.00

Donald Stewart, Staff – 30% Commitment for Period One

Wages:	\$7,431.00
Benefits:	<u>\$5,061.00</u>
Total:	\$12,492.00

Travel for Period One – 7/01/2020 to 10/31/2020 to Include: 0.00% Indirect Cost Rate

Travel from University of CA, Davis – to Southern California to visit multiple locations
August/September 2020

Airfare: \$275 x 2 =	\$550.00
Car Rental: \$100 x 4 days x 1 Compact Car =	\$400.00
Hotel: \$235 x 4 days x 2 rooms single occupancy =	\$1880.00
Meals: \$60 x 4 days x 2 people =	\$480.00
Mileage: 135 miles/day x 4 days x \$0.58 =	\$313.20
Meeting materials, refreshments and lunch: 3 x 20 people x \$30	<u>\$1880.00</u>
Total =	\$5,423.20

Total Budget: Period Two – 11/01/2020 to 12/31/2020: \$21,560

Personnel for Period Two – 11/01/2020 to 12/31/2020

Karen M. Jetter, Principle Investigator – 45% Commitment for Period Two

Wages:	\$7,262.00
Benefits:	<u>\$3,246.00</u>
Total:	\$10,508.00

Donald Stewart, Staff – 30% Commitment for Period Two

Wages:	\$3,715.00
Benefits:	<u>\$2,530.00</u>
Total:	\$6,245.00

Travel for Period Two – 11/01/2020 to 12/31/2020

Travel from University of CA, Davis – to Southern California to visit multiple locations to include Production Research Committee Presentation at CAC Office in Irvine, CA

Airfare: \$275 x 2 =	\$550.00
Car Rental: \$100 x 4 days x 1 Compact Car =	\$400.00
Hotel: \$235 x 4 days x 2 rooms single occupancy =	\$1880.00
Meals: \$60 x 4 days x 2 people =	\$480.00
Mileage: 135 miles/day x 4 days x \$0.58 =	\$313.20
Meeting materials, refreshments and lunch: 3 x 20 people x \$30	\$1880.00
Total =	\$5,423.20

	Period 1	Period 2
Wages:	\$21,954.00	\$10,977.00
Benefits:	\$11,553.00	\$5,776.00
Travel:	\$5,423.20	\$5,423.20
Indirect Rate Total:	\$0.00	\$0.00
Total by Period:	\$38,930.00	\$22,176.00

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(https://coststudyfiles.ucdavis.edu/uploads/cs_public/f4/ba/f4bab2ce-ed5f-4103-a412-d472b9c7148d/avocadovsbsloorganicreport2011.pdf). Last accessed 5/3/13.

Karen Marie Jetter

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EDUCATION

Ph.D. 1998 **University of California Davis**, Agricultural and Resource Economics
B.S. 1984 **University of California, San Diego**, Economics

PROFESSIONAL EXPERIENCE

July 2010 – present Associate Research Economist, Agricultural Issues Center,
University of California
April 2003 – June 2010 Assistant Research Economist, Agricultural Issues Center,
University of California
July 1998 – 2002 Post-Doctoral Research Fellow, Agricultural Issues Center,
University of California.
Sept 1990 – June 1998 Research Assistant, Dept of Ag and Resource Economics, UC
Davis.
Sept 1991 – Dec 1992 Teaching Assistant, Futures and Options Department of Agricultural
and Resource Economics, University of California Davis.
June 1991 – Sept. 1991 Research Assistant. The World Bank. Washington. D.C
Sept 1989 – Sept 1990 Consultant, Manes and Associates, Pasadena California
1986 – 1989 Peace Corps Volunteer, Cameroon

PROFESSIONAL ACTIVITIES

Panel member: National Academy of Sciences 2007 for HLB in Florida.

Member: Agricultural and Applied Economics Association
Institute for Operations Research and Management Sciences

HONORS & AWARDS

- **Volunteer of the Year, Peace Corps Cameroon 1986.**

PUBLICATIONS

1. Jetter, Karen M. 2011. Using Price Incentives to Increase the Consumption of Fruits and Vegetables Among a Low-Income Population. Chapter 9 in Nutrients, Dietary Supplements, and Nutraceuticals. Cost Analysis Versus Clinical Benefits, R.R. Watson, J.K. Gerald, V.R. Preedy, (ed), Humana Press, New York.
2. Palma, M.A. Palma, Jetter, K.M. . 2012. Will the 2010 Dietary Guidelines for Americans be Any More Effective for Consumers? Choices, 27(1): 9.
3. Grafton-Cardwell, E., K. M. Jetter, M. Daugherty and K. Lynn-Paterson. 2012 Web-based information for managing asian citrus psyllid for California growers and homeowners, Poster presentation at 4th Annual Citrus Health Research Forum, October 15-17, 2013.

4. Jetter, K. M. 2013. Measuring the effect of supermarket fruit and vegetable promotions on sales of fresh produce. Report prepared for the California Department of Public Health.
5. Jetter, Karen M.. 2014 Consumer and Producer Benefits of Meeting the 2010 Dietary Guidelines for Fruits and Vegetables. Report prepared for the California Department of Public Health.
6. 2014 K.M. Jetter, J.M. Morse, J.N. Kabashina. The cost of the glassy-winged sharpshooter for California grape, citrus, and nursery industries. *California Agriculture*.
7. 2015. K.M. Jetter, M. Yarborough, D.L. Cassady, D.M. Styne. Building research capacity with members of underserved American Indian/Alaskan Native communities: Training in Research Ethics and the Protection of Human Subjects. *Health Promotion Practice*. 16(3):419-25
8. 2015 Mark S. Hoddle, Keith Warner, John Steggall, and Karen M. Jetter. Classical Biological Control of Invasive Legacy Crop Pests: New Technologies Offer Opportunities to Revisit Old Pest Problems in Perennial Tree Crops. *Insects*, 6: 13-37.
9. 2016. Jetter, Karen M Grafton-Cardwell, Elizabeth. Economics of Asian citrus psyllid eradication in Ventura County. *Citrograph*
10. 2018. Karen M Jetter and Kjersti Nes. *The Cost to Manage Invasive Aquatic Weeds in the California Bay-Delta*. ARE Update, 21(3): 9-11.
11. 2018 Karen M Jetter and Kjersti Nes. *How Does Meeting the 2015–2020 Dietary Guidelines for Americans Benefit U.S. Fruit and Vegetable Growers?* ARE Update, 21(5): 5-8.

Other PUBLICATIONS related to project

12. K.M. Jetter. 2009 The Potential Economic Effects of the Establishment of the Light Brown Apple Moth. Final report prepared for the California Department of Food and Agriculture.
13. K.M. Jetter, K. Godfrey. 2009 Diaprepes root weevil, a new California pest, will raise costs for pest control and trigger quarantines. *California Agriculture*, 63(3): 121-126.
14. Jetter, Karen M., Joseph G. Morse. 2010 The economics of Pierce's disease in California. Proceedings of 2010 Pierce's Disease Research Symposium, Dec. 15-17, San Diego, CA, California Dept. of Food & Agriculture, 277-282.

DANIEL A. SUMNER

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Education

University of Chicago, Ph.D., 1978, Economics (Labor Economics and Agricultural Economics)
University of Chicago, M. A., 1977, Economics; Michigan State University, M. A., 1973, Economics
California State Polytechnic University, San Luis Obispo, B. S., 1971, Agricultural Management

Current Positions and Selected Professional Experience

1997 - Director, University of California Agricultural Issues Center
1993 - Frank H. Buck, Jr. Professor, Department of Agricultural and Resource
Economics, University of California, Davis
2011-2014 Executive Director, UC Davis Agribusiness Executive Seminar
1992-1993 Assistant Secretary for Economics, U.S. Department of Agriculture
1990-1992 Deputy Assistant Secretary for Economics, U.S. Department of Agriculture
1978-1991 Professor, Department of Economics and Business, North Carolina State
University (on leave, Sept. 1987- Feb. 1989 and Jan. 1990-Dec. 1991)
1987-1989 Senior Staff Economist, President's Council of Economic Advisers

Selected Professional Awards, Honors and Distinctions

National Academy of Sciences Taskforce of Agricultural Statistics 2017 - 2018
Best Journal Article, *Agricultural Economics* for 2016, awarded August 2017
Snyder Memorial Lecture, Purdue University, April 2017
Best Published Research Paper, Food and Agricultural Marketing and Policy Section,
Agricultural and Applied Economics Association, 2016.
Fellows Lecture, Agricultural and Applied Economics Association, July 2015
Best Journal Article, *American Journal of Agricultural Economics*, 2015
Best Journal Article, *Australian Journal of Agricultural and Resource Economics*, 2006
Fellow, American Agricultural Economics Association, 1998
Award for Quality of Research Discovery, American Agricultural Economics Association, 1996
Award for Quality of Communication, American Agricultural Economics Association, 1996;
Award for Distinguished Policy Contribution, American Agricultural Economics Assoc., 1995

National Policy Service

As Senior Staff Economist at the President's Council of Economic Advisers, I provided analysis on agricultural economic issues facing the U.S. government. As USDA Assistant Secretary for Economics, I provided oversight and guidance for data collection, projections, economics research, and policy analysis for U.S. agriculture, supervised more than 1,000 professional economists and statisticians and provided personal policy analysis and counsel to the Secretary and other senior government officials.

Publications

Supervising author of dozens of "Cost and Returns Studies" of the University of California. These studies are published and posted by the UC Agricultural Issues Center. I have devised innovations to study design and execution, including related to farm labor, evaluation of technologies, and links to innovations. These cover the full range of California agriculture and are updated for new conditions regularly.

Selected Books (editor or Author)

Sumner, Daniel A. Editor. 2003. *Exotic Pests and Diseases: Biology and Economics for Biosecurity*. Ames, Iowa: Iowa State Press.
Mullen, John D., Julian M. Alston, Daniel A. Sumner, Marcia T. Kreith and Nicolai V. Kuminoff. 2003. *Returns to University of California Pest Management Research and Extension: Overview and Case Studies Emphasizing IPM*. Oakland, California: University of California Agriculture and Natural Resources, ANR Publication 3482.

Selected Recent Professional Journal Articles

- Sumner, Daniel A. and Ton Zuijdwijk. 2019. "The law and economics of Canada's WTO litigation contesting U.S. country-of-origin labeling (COOL)." *Canadian Journal of Agricultural Economics*. 67(5): 327-347.
- Champetier, Antoine and Daniel A Sumner. 2019. "Marginal costs and likely supply elasticities for pollination and honey." *American Journal of Agricultural Economics*. 101(5):1373-1385
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- Lee Hyunok and Daniel A. Sumner. 2018. "Dependence on policy revenue poses risks for investments in dairy digesters." *California Agriculture* (December)72(4):226-235.
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- Yu, Jisang and Daniel A Sumner. 2018. "Effects of subsidized crop insurance on crop choices." *Agricultural Economics* 49 4 (July): 533–545
- Yu, Jisang, Aaron Smith, and Daniel A. Sumner. 2018. "Effects of Crop Insurance Premium Subsidies on Crop Acreage." *American Journal of Agricultural Economics*. 100(1): 91-114.
- Bovay, John and Daniel A. Sumner. 2018. "Economic Effects of the U.S. Food Safety Modernization Act." *Applied Economic Perspectives and Policy*. ppx039, <https://doi.org/10.1093/aep/ppx039>
- Sumner, Daniel A. 2017. "Economics of US State and Local Regulation of Farm Practices, with Emphasis on Restrictions of Interstate Trade." *Annual Review of Resource Economics* 9:1, 13-31
- Lee, Hyunok and Daniel A. Sumner. 2016. "Modeling the effects of local climate change on crop acreage" *California Agriculture*, 70(1):9-14.
- Gustafson, Christopher R, Travis J. Lybbert and Daniel A. Sumner. 2016. "Consumer sorting and hedonic valuation of wine attributes: exploiting data from a field experiment." *Agricultural Economics*, 47(1): 91-103.
- Lee, Hyunok and Daniel A. Sumner. 2015 "Economics of downscaled climate-induced changes in cropland, with projections to 2050: evidence from Yolo County California." *Climatic Change*, 132(4): 723-737.
- Saitone, Tina L., Richard J. Sexton, and Daniel A. Sumner. 2015. "What Happens When Food Marketers Require Restrictive Farming Practices?" *American Journal of Agricultural Economics*, 97(4): 1021-1043.
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- Matthews, William A. and Daniel A. Sumner. 2015. "Effects of housing system on the costs of commercial egg production" *Poultry Science*, 94(1): 552-557.
- Pouliot, Sebastien and Daniel A. Sumner. 2014. "Differential impacts of country of origin labeling: COOL econometric evidence from cattle markets." *Food Policy*, 49: 107-116.
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- Hendricks, Nathan P., S. Sinnathamby, K. Douglas-Mankin, Aaron Smith, Daniel A. Sumner and D.H. Earnhart. 2014. "The Environmental Effects of Crop Price Increases: Nitrogen Losses in the U.S. Corn Belt." *Journal of Environmental Economics and Management*, 68(3): 507-526.
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- Pouliot, Sébastien and Daniel A. Sumner. 2012. "Traceability, Recalls, Industry Reputation and Product Safety." *European Review of Agricultural Economics*, 40(1):121-

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Experience

Costs and Returns Studies Program Coordinator, Economic Crop Analyst, (November 2014-Present). University of California Agricultural Issues Center, Agricultural and Resource Economics Department, Davis. Supervisor; Daniel A. Sumner, Director, Agricultural Issues Center.

Field Research Director, IR-4 Field Research Center, (April 2007-November-2014)
University of California Department of Plant & Environmental Sciences, Davis.
Supervisor; Tom Lanini, Retired. UCCE Specialist, Weed Ecologist.

Staff Research Associate, Regional Cereal Grains Project (September 2001-April 2007)
University of California, Cooperative Extension, Davis CA.
Supervisor; Lee Jackson, Retired. UCCE Specialist, Small Cereal Grains.

Agricultural Biologist, (August 1999-September 2001)
Solano County Agriculture Department, Fairfield, CA.
Supervisor; Dave Singh, Assistant Agricultural Commissioner, Deputy Sealer.

Crop Production Manager (February 1992-September 1998)
Sustainable Farming Systems Project, (SAFS) University of California, Davis, CA.
Supervisor; Steve Temple, Retired. Project Coordinator, Principle Investigator.

Education

California State University, Chico.
Bachelor of Science, Agricultural Science 1991.

Special Skills

Computer Literacy; IBM, Microsoft office/windows, Access, Budget Planner, Excel, Word, Email/Facebook/Twitter literate.

Qualified Applicators License; #QAL 100321. California Department of Pesticide Regulation.

CAL-EPA/UC IPM, Train the Trainer, WPS Fieldworker and Pesticide Safety Training.
Updated March, 2018.

California driver's license; Class C.

GLP (Good Laboratory Practice), Training; 4/07, 11/07, 11/08.

Military

United States Army, Trained as Forward Observer and Tacfire Computer operator.
Active Duty: February 1985-February 1987, Army Reserve Duty: February 1987-January 1993.
3rd Armored Division, HHB Divarty Commander's Driver and S3-Operations support.
Hanau, West Germany.

DONALD STEWART
Curriculum Vitae

Current Position:

As the Coordinator of the Costs and Returns Studies Program I update the existing studies and write new studies on agricultural crops and animal production operations throughout California. The studies provide information on the expected costs, yields, revenue, and net returns for a specific commodity in a given county or region of California based on a specific hypothetical, well-managed farming enterprise. The studies include multiple tables and a narrative explaining the assumptions and management practices. We use a combination of computer programs to complete these reports. I contact and work with UCCE Farm Advisors, farmers, equipment and chemical companies, local cooperators, Ag lenders and appraisers. We obtain the data then cross reference information to ensure the accuracy of these reports. I work with UCANR social media personnel for new releases. I quest lecture an undergraduate agricultural management course explaining the costs and returns studies and how they are used by the agriculture industry. The cost studies are available on the UC Davis Agricultural and Resource Economics Department website, coststudies.ucdavis.edu/current.php. @aic_ucanr.

Previous Experience:

IR-4 Project Field Research Director, Field Research Center at UC Davis. I conducted field trials for pesticide residue testing according to USDA EPA guidelines, Agriculture and Agri-Food Canada (AAFC), GLP compliance (Good Laboratory Practice), IR-4 protocols and UCD SOP's (Standard Operating Procedures). I was in charge of the budgets and all aspects of setting up and managing all projects. I conducted 20-25 trials annually on different crops in various locations thought northern California. Trials varied in size and scope of chemical applications to foliage, soil, orchards and vineyard air-blast applications. I conducted trials in cold storage and agricultural product processing facilities. I also conducted Ornamental Horticultural crop safety and pesticide efficacy trials under IR-4 Guidelines. I was tasked with IR-4's first Public Health trial for mosquito control.

I conducted field tours explaining GLP requirements and field trial setup for visitors from the USA and Japan. I assisted with Plant Science courses that have labs in the field that relate to pesticides and pest control. I trained co-workers and assisted with technical planning and administrative functions to meet the Western Regional Field Director and Quality Assurance Unit needs?. The IR-4 Field Center was inspected by EPA on two separate occasions with no violations.

The Regional Cereal Grains Project was mainly yield comparison variety trials, (barley, oats, triticale and wheat) with approximately 60 projects in 15 locations throughout the state totaling approximately 5,000 research plots. At the Davis campus site we had 5-7 acres which included barley and wheat disease screening nurseries. These nurseries contained 2,500 to 3,500 varieties per nursery, under evaluation from various private and University plant breeders within the USA and other Countries.

I contacted and scheduled all aspects of on-farm projects with the farmers and research station managers. I was responsible for operation and maintenance on the project equipment. I assist with in-field crop evaluation and processing of sub-samples in the field lab. I was also in

charge of the current varieties' inventory. I generate the plot maps, labels for harvest bags, data entry and conducted over 120 statistical analysis annually.

Crop Production Manager of the Sustainable Farming Systems Project: This project was a comparison study of conventional, reduced input and organic farming systems typical to the Sacramento Valley. The crops included field corn, oats/vetch/peas, safflower, processing tomatoes and wheat/bean double crop. We planted various summer and winter cover crops. It consisted of sixteen acres-main plots and an eight-acre companion research area. As Production Manager, I was responsible for all the farming operations across all systems. I assisted in field sampling and analysis.

I designed, built, conducted maintenance and operated a variety of conventional and conservation tillage equipment. We used various planters, cultivators, irrigation equipment, pesticide and fertilizer applicators and crop harvesters. I contracted and supervised custom farming operations such as tomato transplanting & harvesting. I contracted some of the harvested crops through field persons for sale and for donations to county FFA programs as feed for project animals.

I sat on the grower panel during field days for the question and answer period. I reported by-monthly on field operations to the advisory panel and co-authored the annual progress report.

As a Biologist with the Solano County and Glenn County Agriculture Departments, I gained experience of the regulatory side of Agriculture, Air Pollution control and Weights & Measures. I was the Biologist in charge of the Weed Management Area Workgroup. I wrote the mission statement and wrote meeting minutes for distribution to workgroup members. I worked with State and Federal technicians in monitoring pesticides and pest control measures and programs within Weights & Measures.

COOPERATIVE EXTENSION
VENTURA

COUNTY OF

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March 2, 2020

Karen Jetter
Research Economist, Ag Issues Center
University of California
Davis 95616

Dear Karen;

I look forward to working on an updated avocado cost study with you. These are extremely helpful to everyone involved with this crop and are great teaching tools for those not yet involved with the crop.

Sincerely,

Ben Faber, Farm Advisor



Cooperative Extension Riverside County
Sonia Rios, Area Subtropical Horticulture Advisor
21150 Box Springs Road, Ste 202, Moreno Valley, CA 92557-8718

March 9, 2020

Dr. Karen Jetter
Research Economist, Ag Issues Center
University of California
Davis, CA 95616

To whom it may concern,

I am writing as an Area Subtropical Farm advisor for the University of California Cooperative Extension in Southern California and I am writing in support of the cost study work proposed by Karen Jetter et al.

This proposed project will contribute a great deal to all avocado growers in California. I am looking forward to working with this group. I eagerly anticipate the outcome on this project. Please feel free to contact me for more information at 951-683-6491, EXT 224, sirios@ucanr.edu.

Respectfully,

A handwritten signature in cursive script that reads 'Sonia Rios'.

Sonia Rios
Subtropical Horticulture Farm Advisor
University of California Cooperative Extension Riverside County
21150 Box Springs Road, Suite 202, Moreno Valley, CA 92557-8718

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University of California, County of Riverside and U.S. Department of Agriculture Cooperating



CAL POLY

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*College of Agriculture, Food
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30 March 2020

Timothy Spann, PhD, CPH
Research Program Director
California Avocado Commission
12 Mauchly, Suite L
Irvine, California 92618

Tim:

We are excited about the opportunity to participate in the current collaborative research project between the California Avocado Commission and the University of California, Riverside as we initially discussed in April 2019 and as we have discussed in further detail in your letter dated 10 July 2019 and our conversations and emails in the fall of 2019. We agree that Cal Poly is an excellent location for a long-term evaluation/demonstration block of new Phytophthora resistant avocado rootstock. That industry members have already provided in-kind support that allowed us to prepare the field for planting speaks highly of this project and its importance to the avocado industry.

Once established, we can maintain the orchard, make it available for grower field days, and provide access for researchers collecting data. As early as this year, I can begin to collect early establishment and tree growth data. In fact, after learning about this project, multiple students have already volunteered to participate in the data collection as the basis of their senior projects. In the future, I can apply for non-industry grant funding to expand and extend the data collection and increase student involvement, providing them with invaluable, industry-relevant research experience.

If additional information is needed, do not hesitate to contact me.

Sincerely,

Lauren

Dr. Lauren Garner
Professor
Horticulture and Crop Science Department
805.602.0763 (cell)

Cal Poly San Luis Obispo

Avocado Rootstock Trial Budget Request

Total Area = 3.8 acres

15 x 15 ft spacing

500 trees

Task	Cost Per Acre	Total
Filter station		\$10,000
Drain inlet parts and install		\$12,000
Layout	\$520	\$1,976
Irrigation system	\$2,000	\$7,600
Irrigation install	\$1,200	\$4,560
Planting and staking	\$8 per tree	\$4,000
5% gift fee		\$2,007
Total		\$42,143