2565 Alluvial Ave. Suite #152, Clovis, California 93611 • P. 559 456-9096 • F. 559 456-9099

AGENDA

California Olive Committee
Full Committee Meeting
San Joaquin County Ag Commissioner Office
2101 E. Earhart Ave.
Stockton, CA 95206
Zoom/Conference Call

December 19, 2024
10:00 A.M.

Join Zoom Meeting:
https://us02web.zoom.us/j/81368225744
Meeting ID: 813 6822 5744

Dial-in:
+1669-900-6833
Meeting ID: 813 6822 5744

I. Call To Order-Chairman Mike Silveira

a. Roll Call page 3
b. Chairman's comments
c. Approval of 8-7-2024 Full Committee Minutes (action item) page 4

II. Executive Subcommittee

a. 2025 COC Full Committee Elections page 14
b. Approval of MOUs (action item) page 15
c. Approval of 2025 Administration Budget (action item) page 34
d. Delegation of Authority from the Committee to the Executive Director with oversight by the Chairman for inter-item transfers of the administrative budget (action item) page 36

III. Inspection Subcommittee

a. Approval of 2025 Inspection Budget (action item) page 37
b. Delegation of Authority from the Committee to the Executive Director with oversight by the Chairman for inter-item transfer of the inspection budget (action item) page 38

IV. Marketing Subcommittee

a. Approval of 2025 Plan & Budget (action item) page 39

b. Delegation of Authority from the Committee to the Executive Director with oversight by the Chairman for inter-item transfer of the marketing budget (action item) page 42

V. Research Subcommittee

a. Approval of 2025 Research Budget (action item) page 43
b. Delegation of Authority from the Committee to the Executive Director with oversight by the Chairman for inter-item transfer of the research budget (action item) page 81

VI. Review of Fiscal 2025 Budget

a. Approval of 2025 Fiscal Budget (action item) page 82
b. Approval of 2025 Assessment Rate (action item) page 83

VII. Other Business

VIII. Closed Session

IX. Adjournment

CALIFORNIA OLIVE COMMITTEE

June 1, 2023 – May 31, 2025

PRODUCERS

DISTRICT #1 (Counties of Alpine, Tuolumne, Stanislaus, Santa Clara, Santa Cruz all counties north thereof)

Members	Alternates
Andy Weinrich	Carolina Burreson
Michael Silveira	Michael Stokes
Edward Garcia	Kevin Neeley

DISTRICT #2 (Counties of Mono, Mariposa, Merced, San Benito, Monterey, and all counties south thereof)

Members	Alternates
Vito DeLeonardis	Mark Heuer
Pat V. Ricchiuti	Joan Whelan-Vanderhorst
Giulio Zavolta	Jorge Inestroza
Rick Benson	Mark Hendrixson
Galen Pffeifer	Milo Gorden

HANDLERS

Members	Alternates
Felix Musco	Bill McFarland
Dennis Burreson	Janet Edwards
John Pieretti	Tracy Wood
Tomas Masanes Autard	Scott Hamilton
Scott McCoy	Stefan Matthews
America Garman	Paul Adcock
Phil Quigley	**Vacant**
Julia Tinsley	Joyner Yu

FULL COMMITTEE MEETING

WEDNESDAY
AUGUST 7, 2024
11:30 a.m.

San Joaquin County Agricultural Center
2101 E. Earhart Ave.
Stockton, CA 95206

ZOOM/Conference Call
http://us02web.zoom.us/j/82482829659

MINUTES

I. CALL TO ORDER

Chairman Mike SILVEIRA called the Full Committee meeting to order at 11:01 a.m. The following Directors were in attendance:

Members	**Affiliation:**
Andy Weinrich*	
Mike Silveira*	Producer
Edward Garcia*	Producer
Carolina Burreson	Producer
Michael Stokes	Producer
Kevin Neeley	Producer
Pat V. Ricchiuti*	Producer
Giulio Zavolta*	Producer
Galen Pfeiffer*	Producer
Joan Whelan-Vanderhorst	Producer
Jorge Inestroza	Producer
Mark Hendrixson*	Producer
Milo Gorden	Producer
Felix Musco*	Handler
Dennis Burreson*	Handler
John Pieretti*	Handler
Tomas Masanes Autard*	Handler
Scott McCoy*	Handler
America Garman*	Handler
Phil Quigley*	Handler
Julia Tinsley*	Handler
Bill McFarland	Handler

Janet Edwards	Handler
Tracy Wood	Handler
Scott Hamilton	Handler

STAFF

Todd Sanders	California Olive Committee
Elise Oliver	California Olive Committee
Jackie Nakashian	California Olive Committee
Janette Ramos	California Olive Committee

GUESTS:

Jeremy Sasselli	USDA
Gary Keough	USDA
Shawn Clark	USDA
Michael Harutinian	USDA
Katy Sampson	Sampson & Sampson
Linda Pfeiffer	Guest

*Denotes voting members for the Committee.

With the appropriate number of members from producers and handlers in, a quorum was established.

- **MOVED by RICCHIUTI, duly seconded by PFEIFFER and carried THAT the minutes of December 12, 2023, be approved as presented. (MOTION 8-7-24 #1)**

Chairman's Comments

Chairman Mike Silveira, thanked everyone who took the time out of their day to be here in person, and on zoom, for the COC meeting.

II. EXECUTIVE SUBCOMMITTEE

a. Sampson & Sampson 2023 Audit Review - ACTION

Katy Sampson of Sampson & Sampson, LLP has completed the California Olive Committee's 2023 FY audit. Katy Sampson presented the findings to the Committee.

- **MOVED by D. BURRESON, duly seconded by RICCHIUTI and unanimously carried THAT the Full Committee approve the 2023 Fiscal Year Audit. (MOTION 8-7-24 #2)**

b. Approval of 2024 Auditor - ACTION

As a reminder the COC sent out the Request for Proposals last year and selected Sampson & Sampson. The COC will request Sampson & Sampson to rotate the actual person at the firm who conducts the audit.

- **MOVED by HENDRIXSON, duly seconded by PIERETTI and unanimously carried THAT the Full Committee approve Sampson & Sampson as the 2024 Fiscal Year auditor. (MOTION 8-7-24 #3)**

c. 2023-2024 Crop Year Marketing Policy Statement – ACTION

Each year, the California Olive Committee (COC) must approve a Marketing Policy Statement. The Marketing Policy Statement (MPS) is used by the U.S. Department of Agriculture (USDA) to determine the effectiveness of the Federal Marketing Olive Order 932 and its relationship to the requirement established by the Agricultural Marketing Agreement Act.

Changes are highlighted in yellow and are focused on providing updated stats for USDA

- **MOVED by ZAVOLTA, duly seconded by HENDRIXSON and unanimously carried THAT the Full Committee approve the 2023-2024 Crop Year Marketing Policy Statement as presented. (MOTION 8-7-24 #4)**

d. E-Compliance Plan and Annual Compliance Plan – ACTION

Items that differ from the information included in previous year's reports are highlighted in yellow.

Changes made to E-Compliance Plan:

1. Question 2c: Added the 'Director of Programs' as the Director of Programs and Director of Operations will conduct handler audits.
2. Question 6b: Updated to discuss current 2024 FY activities.
3. Question 8b: If the committee formally recommends Sampson and Sampson for the 2024 audit, the plan is completed accordingly to update the number of years with the firm.
4. Question 8c: Updated to state that the Committee conducted an RFP in 2023 and Sampson & Sampson was selected.
5. Question 8f: Updated with our 2024 FY MAP figures.
6. Question 9p: Updated to state what we should collect in 2024 FY assessments. Not in there due to confidentiality.
7. Question 9u: If the Committee reviews and approves the Internal Control Policy, the date will reflect 8/7/24.

8. Question 10e: Added Jacqueline Nakashian as she has a credit card.

Changes made to Annual Compliance Plan:

1. Edited "Trade and Marketing Specialist" to "Director of Programs"
2. Edited "Director of Operations and Research" to "Director of Operations"

- **MOVED by PFEIFFER, duly seconded by MUSCO and unanimously carried THAT the Full Committee approve the E-Compliance Plan and Annual Compliance Plan as presented. (MOTION 8-7-24 #5)**

e. Internal Control Policy – ACTION

The Internal Control Policy has not been reviewed and approved since 2018. At the request of the USDA, we have reviewed the policy and added in the highlighted language pertaining to a hiring policy.

- **MOVED by RICCHIUTI, duly seconded by HENDRIXSON and unanimously carried THAT the Full Committee approve the Internal Control Policy and add language pertaining to a hiring policy. (MOTION 8-7-24 #6)**

f. Bylaws - ACTION

The Bylaws have not been reviewed and approved recently. At the request of the USDA, we have reviewed the Bylaws and are not requesting any changes. The Bylaws accurately describe Committee operations. COC staff did add to the bottom a "Revised On" date for clarification.

- **MOVED by HENDRIXSON, duly seconded by C. BURRESON and unanimously carried THAT the Full Committee approve the Bylaws with the "Revised On" date as presented. (MOTION 8-7-24 #7)**

g. Export Program

ACTIVITIES

- ATP - Southeast Asia
- MAP – Japan & Canada
- EMP - India
- RAPP – Traunche 1 & 2
- USAEDC
- Tradeshows

h. Berry Amendment

In the Berry Amendment (Buy American), olives and olive oil are both listed as a "non-available article" (Section 25.104). At the time the Berry Amendment was written, the domestic olive industry was in its infancy. Currently, our industry believes that they do have the necessary supply and should be removed from this list. We have submitted a request on behalf of table olives, however, the DOD claims that we still not have sufficient supply to meet the military's demands. We made an initial application to the DOD requesting the waiver, however this request was denied on the basis that the CA olive industry does not produce enough to meet 50% of the domestic consumption. We applied for a rebuttal, but this was unfortunately denied as well.

The Olive Growers Council of California's stance is that as long as we can demonstrate that we have enough production to meet the DOD demands, this should suffice to justify our waiver request. For table olives, domestic production is 43,000 tons while the total domestic consumption is 120,500 tons. This equates to 36% of domestic production yet DOD only accounts for only 0.2% of domestic production.

In an effort to continue to pursue the waiver removal, the OGCC hosted a booth, in conjunction with the California Olive Committee, at the American Logistics Association (ALA) trade show in Petersburg, VA where representatives from the OGCC were present to discuss the Berry Amendment waiver request with members of the Defense Logistics Association, US Army, among others. The OGCC has been working closely with Members of Congress to explore additional solutions. The ALA suggested that the OGCC pursue an Amendment to the National Defense Authorization Act (NDAA) for Fiscal Year 2023. Congressman Garamendi submitted the Amendment which was co-sponsored by Congressman Carbajal. The NDAA Amendment was successfully adopted by the House Armed Services Committee and does not require any further voting action moving forward to be adopted. A copy of the Amendment is included in the following pages for your review. Current Update: The DOD was called to action to provide a briefing to HASC by February 1, 2023. The delivered their report in May to Congressman Garamendi's office. Please see report in the following pages.

III. INSPECTION SUBCOMMITTE

a. Incoming and Outgoing 2024-2025 Inspection Charts - ACTION

On March 20, 2021, the Full Committee accepted recommendations made by the Inspection Subcommittee to modify the Incoming and Outgoing Charts to be effective in time for the 2021 crop.

Changes made to Incoming Inspection Requirements include changing the average count per pound range for size small designation to 128-150 and changing the average count per pound range for size petite designation to 151-180.

Changes made to Outgoing Inspection Requirements include changing the tolerance by count 35% under to 1/150 and changing the tolerance for all canning sizes to 1/150 lbs.

These changes were motivated by an oversupply of small fruit.

These changes remain in effect until the Full Committee decides to initiate a change.

- **MOVED by MUSCO, duly seconded by MASANES AUTARD and unanimously carried THAT the Full Committee approve the Incoming and Outgoing 2024-2025 Inspection Charts. (MOTION 8-7-24 #8)**

b. 2024 Import Inspection Report & Inspection Fees Update

USDA will be providing COC staff the below reports, which will be emailed out to industry next week:

1. Import Olives Entry Count by Country, Port & Office Report
2. Imported Olives Meeting & Failing Lots Report
3. Imported Olives Failing Defect Count by Country-Cumulative Report

c. Inspector Training

COC staff was alerted earlier this year that certain inspection ports were not inspecting brineless product coming in (i.e. snack packs/olives to go, chopped, sliced). Staff worked with USDA-SCI to clarify that brineless olives, domestically produced or imported, need to be inspected.

After this was resolved, COC staff spoke with SCI regarding a "training of the trainers," or the subject matter experts in Stockton.

Staff has a meeting with both of the canners next week to determine what samples should be sourced and provided along with the topics that should be covered. SCI is allowing industry to lead this session, so we can essentially write a curriculum.

d. OERS Updates

Todd J. will be reaching out to both canners this month to ensure software is working properly ahead of the receiving stations opening.

Last year, we had some issues with sample tag printers. If anyone is having any issues with the OERS software, please reach out and we will address right away.

The updates that COC staff and Todd J. were working on last year related to registering software, consecutive certs, bin names have been resolved.

IV. MARKETING SUBCOMMITTEE

a. Update on 2024 Marketing Activities

- CA Grown Opt-In
- CA Grown Opt-In-Analytics
- CA Grown Opt-In: Influencer Analytics
- Social Media
- CA Grown Member Feature
- CA Grown Member Feature Program
- Marketing Contingency

V. REVIEW OF CROP ESTIMATES

a. NASS 2024 Estimate Forecast

The USDA National Agricultural Statistics Service (NASS) provided the COC with the 2023 Crop Report in preparation for the 2024 Crop Forecast that will be released on August 9, 2024.

b. 2024 Industry Crop Estimate

Each year, the industry creates an internal crop forecast for the California Olive industry. The Committee will discuss and develop a 2024 crop estimate.

The Full Committee estimated a crop of 45,175 tons for the state.

VI. RESEARCH SUBCOMMITTEE

a. 2023 Final Research Reports

2023 RESEARCH PROJECTS FOR THE CALIFORNA OLIVE COMMITTEE

• Projects in red had No Cost Extensions and are now complete. Final Reports can be found in the following pages of the packet.

Researcher	Project	Amount	No Cost Extension
Dr. Jim Adaskaveg	Management of Foliar Diseases-A. Olive Knot and B. Evaluation of New Fungicides for Control of Olive Leaf Spot	$10,000	
Dr. Jim Adaskaveg	Epidemiology and Management of Olive Knot Caused by Pseudomonas Savastanoi pv. Savastanoi	$21,150	

Carol Lovatt and Elizabeth Fichtner	Integrating Alternate Bearing Mitigation Strategies in a Commercial Table Olive Orchard	$36,511	6/30/2024
Georgia Drakakaki and Louise Ferguson	Evaluating Accede for Ability to Decrease 'Manzanillo' Fruit Detachment Force and Increase Efficiency of Commercial Trunk Shaking and Experimental Canopy of Contact Harvesters	$115,186	6/30/2024
Jim Stewart	Southern San Joaquin Valley Olive Fruit Fly Monitoring	$11,000	
Ernie Simpson	Sacramento Valley Olive Fruit Monitor Project	$9,250	
	Contingency Fund	$0	
	Total	**$203,097**	

b. Review and Update on 2024 projects

- Each year the Research Subcommittee sets priorities of research they would like executed on their behalf for the following year. These efforts are to fund more specific and calculated research to enhance the benefits to the industry. Once the priorities are set, they are provided to the University of California liaisons to request proposals from researchers. Additionally, priorities are distributed to land grant universities across the nation and to private research facilities. Proposals will be reviewed for funding in November by the subcommittee
- On the following page are the 2024 Research Priorities.

2024 RESEARCH PROJECTS FOR THE CALIFORNIA OLIVE COMMITTEE

Researcher	Project	Amount
Dr. Jim Adaskaveg*	Management of Foliar Diseases-A. Olive Knot and B. Evaluation of New Fungicides for Control of Olive Leaf Spot	$13,715
Dr. Jim Adaskaveg*	Epidemiology and Management of Olive Knot Caused by Pseudomonas Savastanoi pv. Savastanoi	$21,150
Carol Lovatt and Elizabeth Fichtner	Integrating Alternate Bearing Mitigation Strategies in a Commercial Table Olive Orchard	$33,825
Georgia Drakakaki and Becky Wheeler-Dykes	Evaluation of effects of Accede (ACC), tree architecture, and harvester type on enhancing horticultural maturity and abscission zone development and commercial trunk shaking efficiency in table olives	$315,380
Rodrigo Almeida	Survey of Xylella fastidiosa diversity within California olive trees	$29,750
Jim Stewart	Southern San Joaquin Valley Olive Fruit Fly Monitoring	$12,000
Ernie Simpson	Sacramento Valley Olive Fruit Monitor Project	$9,250
	Total	**$251,072**

VII. OTHER BUSINESS

None

VIII. ADJOURNMENT

Chairman Mike Silveira adjourned the Full Committee meeting at 1:09 p.m.

Todd W. Sanders
Executive Directors
California Olive Committee

SUMMARY FOR MOTIONS FOR AUGUST 7, 2024

MOTION 8-7-2024 #1 **APPROVED**

MOVED by RICCHIUTI, duly seconded by PFEIFFER and carried THAT the minutes of December 12, 2023, be approved as presented.

MOTION 8-7-2024 #2 **APPROVED**

MOVED by BURRESON, duly seconded by RICCHIUTI and unanimously carried THAT the Full Committee approve the 2023 Fiscal Year Audit.

MOTION 8-7-2024 #3 **APPROVED**

MOVED by HENDRIXSON, duly seconded by PIERETTI and unanimously carried THAT the Full Committee approve Sampson & Sampson as the 2024 Fiscal Year auditor.

MOTION 8-7-2024 #4 **APPROVED**

MOVED by ZAVOLTA, duly seconded by HENDRIXSON and unanimously carried THAT the Full Committee approve the 2023-2024 Crop Year Marketing Policy Statement as presented.

MOTION 8-7-2024 #5 **APPROVED**

MOVED by PFEIFFER, duly seconded by MUSCO and unanimously carried THAT the Full Committee approve the E-Compliance Plan and Annual Compliance Plan as presented.

MOTION 8-7-2024 #6 **APPROVED**

MOVED by RICCHIUTI, duly seconded by HENDRIXSON and unanimously carried THAT the Full Committee approve the Internal Control Policy and add language pertaining to a hiring policy.

MOTION 8-7-2024 #7 **APPROVED**

MOVED by HENDRIXSON, duly seconded by C. BURRESON and unanimously carried THAT the Full Committee approve the Bylaws with the "Revised On" date as presented.

MOTION 8-7-2024 #8 **APPROVED**

MOVED by MUSCO, duly seconded by MASANES AUTARD and unanimously carried THAT the Full Committee approve the Incoming and Outgoing 2024-2025 Inspection Charts.

****INFORMATION ONLY****

FROM: COC EXECUTIVE SUBCOMMITTEE

SUBJECT: 2025 COC FULL COMMITTEE ELECTIONS

BACKGROUND:

COC Staff sent each canner a form to nominate their respective members and alternates to the Full Committee for the 2025-2027 term.

This meeting will serve as the formal Nomination Meeting for handlers. Staff will read out the nominations received and/or collect nominations from the handlers now.

****ACTION REQUIRED****

FROM: COC EXECUTIVE SUBCOMMITTEE

SUBJECT: APPROVAL OF MOUs

RECOMMENDATION: THAT the Committee approve the Memorandum of Understandings (MOUs) between the California Olive Committee and the other organizations that the California Apple Commission manages. The MOUs can be seen in the following pages.

Memorandum of Understanding (MOU)
Between
CALIFORNIA OLIVE COMMITTEE (COC)
And
THE CONSOLIDATED CENTRAL VALLEY TABLE GRAPE PEST AND DISEASE CONTROL DISTRICT (The District)

Effective Date: 11/1/2024

1. Purpose

This Memorandum of Understanding (MOU) sets forth the terms and understanding between COC and The District to collaborate on projects and programs that mutually benefit both organizations.

The purpose of this MOU is to increase the efficiency of their independent organizations which engage in similar activities for the California olive and table grape industries, respectively. Ultimately, this MOU will establish a partnership that will pool resources and lower cost for each individual organization. Through this collaboration, both organizations aim to lower costs and achieve intended results or impact with each individual program. Each organization, shall take all reasonable steps to ensure that COC expenses are paid directly from COC funds and The District expenses are paid directly from The District funds. However, to the extent any expenses are incurred each respective organization (District and COC) shall reimburse each other for all actual expenses incurred by one another on the others behalf.

2. Background

Being the both the COC and The District have similar missions to promote, research, and educate on behalf of their respective commodities, collaboration is important and prudent from a cost sharing perspective. Due to both the COC and District being managed by the California Apple Commission (CAC), ease and coordination between the programs is significantly easier and efficient.

3. Joint Responsibilities

Both COC and District agree to:

- Collaborate in good faith to achieve the goals outlined in this MOU.
- Share relevant data, information, and resources as needed for the success of the collaborative projects.
- Share additional joint responsibilities, such as funding arrangements, travel expenses, and resource allocation

4. Communication

The parties agree to maintain open and regular communication regarding the progress and status of the collaborative projects or ventures. Both Boards will be updated on challenges, progress, and next steps in joint ventures.

Primary points of contact:

- **For CALIFORNIA OLIVE COMMITTEE:**
  Name: Michael Silveira
  Title: Chairman
  Email: silveiraolive@hotmail.com
  Phone: 559-456-9096

  Or

Name: Todd Sanders
Title: CEO – California Olive Committee
Email: Tsanders@calolive.org
Phone: 559-456-9096

- **For THE DISTRICT**

  Name: Michael Beagle
  Title: Chairman
  Email: mbeagle@sunviewvineyards.com
  Phone: 559-210-0118

  Or

  Name: Todd Sanders
  Title: CEO – The District
  Email: tsanders@calapple.org
  Phone: 559-210-0118

5. Duration

This MOU is effective upon the date of signing and will remain in effect for one year, unless terminated by either party as outlined below.

6. Amendments

This MOU may be amended by mutual written consent of both parties. Any amendments shall be signed and attached to this original MOU.

7. Termination

Either party may terminate this MOU by providing 90 days' written notice to the other party. Upon termination, both parties agree to work in good faith to conclude or transition any ongoing projects. The Committee, as well as the Secretary of Agriculture, may terminate the agreement and be relieved of payment obligations. The Committee and USDA reserve the right, at their discretion and for any reason deemed sufficient, to cancel or modify the agreement after the date of signature. In such event, it is agreed that the Committee is liable for all commitments made prior to cancellation or modification and shall reimburse the Agency for all reasonable amounts due or owing in accordance with this contract at the time of said termination.

8. Non-Binding Agreement

This MOU is a non-binding agreement and does not constitute a legally enforceable contract. It serves as a statement of the parties' intent to collaborate and does not obligate either party to a legal commitment.

9. Non-Discrimination/Civil Rights

The California Olive Committee and The Consolidated Central Valley Table Grape Pest and Disease Control District agree that, during the performance of this Agreement, they will not discriminate against any employee or applicant for employment because of race, color, national origin, religion, sex, age, disability, protected genetic information, or reprisal. The California Olive Committee and The Consolidated Central Valley Table Grape Pest and Disease Control District further agree that they will fully comply with any and all applicable Federal, State, and local equal employment opportunity statutes, ordinances, and regulations, including, but not limited to, Title VII of the Civil Rights Act of 1964, the Americans with Disabilities Act of 1990, the Age Discrimination in Employment Act of 1967, Genetic Information Act of 2008, and the Equal Pay Act of 1963. Nothing in this section shall require the California Olive Committee and The Consolidated Central Valley Table Grape Pest and Disease Control District to

comply with or become liable under any law, ordinance, regulation, or rule that does not otherwise apply to the Committee.

10. Records
Accurate records, books, and documents must be kept involving transactions relating to this agreement. These records, books, and documents must be retained for three (3) years. These records, books, and documents may be subject to inspection and audit by a representative of the USDA, the California Olive Committee, or both.

11. Prohibited Activities
The Consolidated Central Valley Table Grape Pest and Disease Control District agrees it will not engage in lobbying efforts or other prohibited activities on behalf of the California Olive Committee. No funds paid by or to the California Olive Committee shall be used for the purpose of attempting to influence any government policy or any governmental action.

12. Confidentiality
The Consolidated Central Valley Table Grape Pest and Disease Control District understands that the California Olive Committee is a federal marketing order subject to the Agricultural Marketing Agreement Act of 1937 (Act) and related regulations. Federal law and regulations require the California Olive Committee to maintain in confidence any and all proprietary and trade secret information. As such, The Consolidated Central Valley Table Grape Pest and Disease Control District agrees, represents, and warrants that all proprietary and trade secret information shall be received and handled only by The Consolidated Central Valley Table Grape Pest and Disease Control District. Any and all officers, employees, and agents of the California Olive Committee and The Consolidated Central Valley Table Grape Pest and Disease Control District shall each keep and maintain all information obtained as a result of this Agreement confidential to the extent required by the USDA.

13. Signatures
By signing below, both parties agree to the terms outlined in this MOU.

Michael Silveira	Todd Sanders
Chairman – California Olive Committee	CEO – The District

Memorandum of Understanding (MOU)
Between
CALIFORNIA OLIVE COMMITTEE (COC)
And
OLIVE GROWERS COUNCIL OF CALIFORNIA (OGCC)

Effective Date: 11/1/2024

1. Purpose

This Memorandum of Understanding (MOU) sets forth the terms and understanding between COC and OGCC to collaborate on projects and programs that mutually benefit both organizations.

The purpose of this MOU is to increase the efficiency of their independent organizations, which engage in similar activities for the California olive and Olive Growers, respectively. Ultimately, this MOU will establish a partnership that will pool resources and lower cost for each individual organization. Through this collaboration, both organizations aim to lower costs and achieve intended results or impact with each individual program. Each organization, shall take all reasonable steps to ensure that COC expenses are paid directly from COC funds and OGCC expenses are paid directly from OGCC funds. However, to the extent any expenses are incurred each respective organization (OGCC and COC) shall reimburse each other for all actual expenses incurred by one another on the others behalf.

2. Background

Being that both the COC and OGCC have similar missions to promote, research, and educate on behalf of their respective commodities, collaboration is important and prudent from a cost sharing perspective. Due to both the COC and OGCC being managed by the California Apple Commission (CAC), ease and coordination between the programs is significantly easier and efficient.

3. Joint Responsibilities

Both COC and OGCC agree to:

- Collaborate in good faith to achieve the goals outlined in this MOU.
- Share relevant data, information, and resources as needed for the success of the collaborative projects.
- Share additional joint responsibilities, such as funding arrangements, travel expenses, and resource allocation

4. Communication

The parties agree to maintain open and regular communication regarding the progress and status of the collaborative projects or ventures. Both Boards will be updated on challenges, progress, and next steps in joint ventures.

Primary points of contact:

- **For CALIFORNIA OLIVE COMMITTEE:**
  Name: Michael Silveira
  Title: Chairman
  Email: silveiraolive@hotmail.com
  Phone: 559-456-9096

  Or

Name: Todd Sanders
Title: CEO – California Olive Committee
Email: Tsanders@calolive.org
Phone: 559-456-9096

- **For Olive Growers Council of California**

  Name: Michael Silveira
  Title: Chairman
  Email: silveiraolive@hotmail.com
  Phone: 559-456-9096

  Or

  Name: Todd Sanders
  Title: CEO – Olive Growers Council of California
  Email: tsanders@theogcc.org
  Phone: 559-5788438

5. Duration

This MOU is effective upon the date of signing and will remain in effect for one year, unless terminated by either party as outlined below.

6. Amendments

This MOU may be amended by mutual written consent of both parties. Any amendments shall be signed and attached to this original MOU.

7. Termination

Either party may terminate this MOU by providing 90 days' written notice to the other party. Upon termination, both parties agree to work in good faith to conclude or transition any ongoing projects. The Committee, as well as the Secretary of Agriculture, may terminate the agreement and be relieved of payment obligations. The Committee and USDA reserve the right, at their discretion and for any reason deemed sufficient, to cancel or modify the agreement after the date of signature. In such event, it is agreed that the Committee is liable for all commitments made prior to cancellation or modification and shall reimburse the Agency for all reasonable amounts due or owing in accordance with this contract at the time of said termination.

8. Non-Binding Agreement

This MOU is a non-binding agreement and does not constitute a legally enforceable contract. It serves as a statement of the parties' intent to collaborate and does not obligate either party to a legal commitment.

9. Non-Discrimination/Civil Rights

The California Olive Committee and Olive Growers Council of California (OGCC) agree that, during the performance of this Agreement, they will not discriminate against any employee or applicant for employment because of race, color, national origin, religion, sex, age, disability, protected genetic information, or reprisal. The California Olive Committee and Olive Growers Council of California further agree that they will fully comply with any and all applicable Federal, State, and local equal employment opportunity statutes, ordinances, and regulations, including, but not limited to, Title VII of the Civil Rights Act of 1964, the Americans with Disabilities Act of 1990, the Age Discrimination in Employment Act of 1967, Genetic Information Act of 2008, and the Equal Pay Act of 1963. Nothing in this section shall require the California Olive Committee and Olive Growers Council of California to

comply with or become liable under any law, ordinance, regulation, or rule that does not otherwise apply to the Committee.

10. Records
Accurate records, books, and documents must be kept involving transactions relating to this agreement. These records, books, and documents must be retained for three (3) years. These records, books, and documents may be subject to inspection and audit by a representative of the USDA, the California Olive Committee, or both.

11. Prohibited Activities
The Olive Growers Council of California (OGCC) agrees it will not engage in lobbying efforts or other prohibited activities on behalf of the California Olive Committee. No funds paid by or to the California Olive Committee shall be used for the purpose of attempting to influence any government policy or any governmental action.

12. Confidentiality
Olive Growers Council of California (OGCC) understands that the California Olive Committee is a federal marketing order subject to the Agricultural Marketing Agreement Act of 1937 (Act) and related regulations. Federal law and regulations require the California Olive Committee to maintain in confidence any and all proprietary and trade secret information. As such, Olive Growers Council of California agrees, represents, and warrants that all proprietary and trade secret information shall be received and handled only by Olive Growers Council of California. Any and all officers, employees, and agents of the California Olive Committee and Olive Growers Council of California shall each keep and maintain all information obtained as a result of this Agreement confidential to the extent required by the USDA.

13. Signatures
By signing below, both parties agree to the terms outlined in this MOU.

Michael Silveira	Todd Sanders
Chairman – California Olive Committee	CEO – Olive Growers Council of California

Memorandum of Understanding (MOU)
Between
CALIFORNIA OLIVE COMMITTEE (COC)
And
CALIFORNIA BLUEBERRY ASSOCIATION (CBA)

Effective Date: 11/1/2024

1. Purpose

This Memorandum of Understanding (MOU) sets forth the terms and understanding between COC and CBA to collaborate on projects and programs that mutually benefit both organizations.

The purpose of this MOU is to increase the efficiency of their independent organizations, which engage in similar activities for the California olive and blueberry industries, respectively. Ultimately, this MOU will establish a partnership that will pool resources and lower cost for each individual organization. Through this collaboration, both organizations aim to lower costs and achieve intended results or impact with each individual program. Each organization, shall take all reasonable steps to ensure that COC expenses are paid directly from COC funds and CBA expenses are paid directly from CBA funds. However, to the extent any expenses are incurred each respective organization (CBA and COC) shall reimburse each other for all actual expenses incurred by one another on the others behalf.

2. Background

Being that both the COC and CBA have similar missions to promote, research, and educate on behalf of their respective commodities, collaboration is important and prudent from a cost sharing perspective. Due to both the COC and CBA being managed by the California Apple Commission (CAC), ease and coordination between the programs is significantly easier and efficient.

3. Joint Responsibilities

Both COC and CBA agree to:

- Collaborate in good faith to achieve the goals outlined in this MOU.
- Share relevant data, information, and resources as needed for the success of the collaborative projects.
- Share additional joint responsibilities, such as funding arrangements, travel expenses, and resource allocation

4. Communication

The parties agree to maintain open and regular communication regarding the progress and status of the collaborative projects or ventures. Both Boards will be updated on challenges, progress, and next steps in joint ventures.

Primary points of contact:

- **For CALIFORNIA OLIVE COMMITTEE:**
  Name: Michael Silveira
  Title: Chairman
  Email: silveiraolive@hotmail.com
  Phone: 559-456-9096

  Or

Name: Todd Sanders
Title: CEO – California Olive Committee
Email: Tsanders@calolive.org
Phone: 559-456-9096

- **For California Blueberry Association**

  Name: Jon Marthedal
  Title: Chairman
  Email: jon@marthedalfarms.com
  Phone: 559-834-2844

  Or

  Name: Todd Sanders
  Title: CEO – California Blueberry Association
  Email: tsanders@calblueberry.org
  Phone: 559-5788438

5. Duration

This MOU is effective upon the date of signing and will remain in effect for one year, unless terminated by either party as outlined below.

6. Amendments

This MOU may be amended by mutual written consent of both parties. Any amendments shall be signed and attached to this original MOU.

7. Termination

Either party may terminate this MOU by providing 90 days' written notice to the other party. Upon termination, both parties agree to work in good faith to conclude or transition any ongoing projects. The Committee, as well as the Secretary of Agriculture, may terminate the agreement and be relieved of payment obligations. The Committee and USDA reserve the right, at their discretion and for any reason deemed sufficient, to cancel or modify the agreement after the date of signature. In such event, it is agreed that the Committee is liable for all commitments made prior to cancellation or modification and shall reimburse the Agency for all reasonable amounts due or owing in accordance with this contract at the time of said termination.

8. Non-Binding Agreement

This MOU is a non-binding agreement and does not constitute a legally enforceable contract. It serves as a statement of the parties' intent to collaborate and does not obligate either party to a legal commitment.

9. Non-Discrimination/Civil Rights

The California Olive Committee and California Blueberry Association (CBA) agree that, during the performance of this Agreement, they will not discriminate against any employee or applicant for employment because of race, color, national origin, religion, sex, age, disability, protected genetic information, or reprisal. The California Olive Committee and California Blueberry Association further agree that they will fully comply with any and all applicable Federal, State, and local equal employment opportunity statutes, ordinances, and regulations, including, but not limited to, Title VII of the Civil Rights Act of 1964, the Americans with Disabilities Act of 1990, the Age Discrimination in Employment Act of 1967, Genetic Information Act of 2008, and the Equal Pay Act of 1963. Nothing in this section shall require the California Olive Committee and California Blueberry Association to comply

with or become liable under any law, ordinance, regulation, or rule that does not otherwise apply to the Committee.

10. Records

Accurate records, books, and documents must be kept involving transactions relating to this agreement. These records, books, and documents must be retained for three (3) years. These records, books, and documents may be subject to inspection and audit by a representative of the USDA, the California Olive Committee, or both.

11. Prohibited Activities

The California Blueberry Association (CBA) agrees it will not engage in lobbying efforts or other prohibited activities on behalf of the California Olive Committee. No funds paid by or to the California Olive Committee shall be used for the purpose of attempting to influence any government policy or any governmental action.

12. Confidentiality

California Blueberry Association (CBA) understands that the California Olive Committee is a federal marketing order subject to the Agricultural Marketing Agreement Act of 1937 (Act) and related regulations. Federal law and regulations require the California Olive Committee to maintain in confidence any and all proprietary and trade secret information. As such, California Blueberry Association agrees, represents, and warrants that all proprietary and trade secret information shall be received and handled only by California Blueberry Association. Any and all officers, employees, and agents of the California Olive Committee and California Blueberry Association shall each keep and maintain all information obtained as a result of this Agreement confidential to the extent required by the USDA.

13. Signatures

By signing below, both parties agree to the terms outlined in this MOU

Michael Silveira	Todd Sanders
Chairman – California Olive Committee	CEO – California Blueberry Association

Memorandum of Understanding (MOU)
Between
CALIFORNIA OLIVE COMMITTEE (COC)
And
OLIVE OIL COMMISSION OF CALIFORNIA (OOCC)

Effective Date: 11/1/2024

1. Purpose

This Memorandum of Understanding (MOU) sets forth the terms and understanding between COC and OOCC to collaborate on projects and programs that mutually benefit both organizations.

The purpose of this MOU is to increase the efficiency of their independent organizations, which engage in similar activities for the California olive and olive oil industries, respectively. Ultimately, this MOU will establish a partnership that will pool resources and lower cost for each individual organization. Through this collaboration, both organizations aim to lower costs and achieve intended results or impact with each individual program. Each organization, shall take all reasonable steps to ensure that COC expenses are paid directly from COC funds and OOCC expenses are paid directly from OOCC funds. However, to the extent any expenses are incurred each respective organization (OOCC and COC) shall reimburse each other for all actual expenses incurred by one another on the others behalf.

2. Background

Being that both the COC and OOCC have similar missions to promote, research, and educate on behalf of their respective commodities, collaboration is important and prudent from a cost sharing perspective. Due to both the COC and OOCC being managed by the California Apple Commission (CAC), ease and coordination between the programs is significantly easier and efficient.

3. Joint Responsibilities

Both COC and OOCC agree to:

- Collaborate in good faith to achieve the goals outlined in this MOU.
- Share relevant data, information, and resources as needed for the success of the collaborative projects.
- Share additional joint responsibilities, such as funding arrangements, travel expenses, and resource allocation

4. Communication

The parties agree to maintain open and regular communication regarding the progress and status of the collaborative projects or ventures. Both Boards will be updated on challenges, progress, and next steps in joint ventures.

Primary points of contact:

- **For CALIFORNIA OLIVE COMMITTEE:**
  Name: Michael Silveira
  Title: Chairman
  Email: silveiraolive@hotmail.com
  Phone: 559-456-9096

  Or

Name: Todd Sanders
Title: CEO – California Olive Committee
Email: Tsanders@calolive.org
Phone: 559-456-9096

- **For Olive Oil Commission of California**

  Name: Michael Fox
  Title: Chairman
  Email: mfox@cal-olive.com
  Phone: 530-846-8000

  Or

  Name: Todd Sanders
  Title: CEO – Olive Oil Commission of California
  Email: tsanders@oocc.org
  Phone: 559-573-8014

5. Duration

This MOU is effective upon the date of signing and will remain in effect for one year, unless terminated by either party as outlined below.

6. Amendments

This MOU may be amended by mutual written consent of both parties. Any amendments shall be signed and attached to this original MOU.

7. Termination
Either party may terminate this MOU by providing 90 days' written notice to the other party. Upon termination, both parties agree to work in good faith to conclude or transition any ongoing projects. The Committee, as well as the Secretary of Agriculture, may terminate the agreement and be relieved of payment obligations. The Committee and USDA reserve the right, at their discretion and for any reason deemed sufficient, to cancel or modify the agreement after the date of signature. In such event, it is agreed that the Committee is liable for all commitments made prior to cancellation or modification and shall reimburse the Agency for all reasonable amounts due or owing in accordance with this contract at the time of said termination.

8. Non-Binding Agreement
This MOU is a non-binding agreement and does not constitute a legally enforceable contract. It serves as a statement of the parties' intent to collaborate and does not obligate either party to a legal commitment.

9. Non-Discrimination/Civil Rights
The California Olive Committee and Olive Oil Commission of California (OOCC) agree that, during the performance of this Agreement, they will not discriminate against any employee or applicant for employment because of race, color, national origin, religion, sex, age, disability, protected genetic information, or reprisal. The California Olive Committee and Olive Oil Commission of California further agree that they will fully comply with any and all applicable Federal, State, and local equal employment opportunity statutes, ordinances, and regulations, including, but not limited to, Title VII of the Civil Rights Act of 1964, the Americans with Disabilities Act of 1990, the Age Discrimination in Employment Act of 1967, Genetic Information Act of 2008, and the Equal Pay Act of 1963. Nothing in this section shall require the California Olive Committee and Olive Oil Commission of California to comply with or become liable under any law, ordinance, regulation, or rule that does not otherwise apply to the Committee.

10. Records
Accurate records, books, and documents must be kept involving transactions relating to this agreement. These records, books, and documents must be retained for three (3) years. These records, books, and documents may be subject to inspection and audit by a representative of the USDA, the California Olive Committee, or both.

11. Prohibited Activities
The Olive Oil Commission of California (OOCC) agrees it will not engage in lobbying efforts or other prohibited activities on behalf of the California Olive Committee. No funds paid by or to the California Olive Committee shall be used for the purpose of attempting to influence any government policy or any governmental action.

12. Confidentiality
Olive Oil Commission of California (OOCC) understands that the California Olive Committee is a federal marketing order subject to the Agricultural Marketing Agreement Act of 1937 (Act) and related regulations. Federal law and regulations require the California Olive Committee to maintain in confidence any and all proprietary and trade secret information. As such, Olive Oil Commission of California agrees, represents, and warrants that all proprietary and trade secret information shall be received and handled only by Olive Oil Commission of California. Any and all officers, employees, and agents of the California Olive Committee and Olive Oil Commission of California shall each keep and maintain all information obtained as a result of this Agreement confidential to the extent required by the USDA.

13. Signatures
By signing below, both parties agree to the terms outlined in this MOU.

Michael Silveira	Todd Sanders
Chairman – California Olive Committee	CEO – Olive Oil Commission of California

Memorandum of Understanding (MOU)
Between
CALIFORNIA OLIVE COMMITTEE (COC)
And
CALIFORNIA BLUEBERRY COMMISSION (CBC)

Effective Date: 11/1/2024

1. Purpose

This Memorandum of Understanding (MOU) sets forth the terms and understanding between COC and CBC to collaborate on projects and programs that mutually benefit both organizations.

The purpose of this MOU is to increase the efficiency of their independent organizations, which engage in similar activities for the California olive and blueberry industries, respectively. Ultimately, this MOU will establish a partnership that will pool resources and lower cost for each individual organization. Through this collaboration, both organizations aim to lower costs and achieve intended results or impact with each individual program. Each organization, shall take all reasonable steps to ensure that COC expenses are paid directly from COC funds and CBC expenses are paid directly from CBC funds. However, to the extent any expenses are incurred each respective organization (CBC and COC) shall reimburse each other for all actual expenses incurred by one another on the others behalf.

2. Background

Being that both the COC and CBC have similar missions to promote, research, and educate on behalf of their respective commodities, collaboration is important and prudent from a cost sharing perspective. Due to both the COC and CBC being managed by the California Apple Commission (CAC), ease and coordination between the programs is significantly easier and efficient.

3. Joint Responsibilities

Both COC and CBC agree to:

- Collaborate in good faith to achieve the goals outlined in this MOU.
- Share relevant data, information, and resources as needed for the success of the collaborative projects.
- Share additional joint responsibilities, such as funding arrangements, travel expenses, and resource allocation

4. Communication

The parties agree to maintain open and regular communication regarding the progress and status of the collaborative projects or ventures. Both Boards will be updated on challenges, progress, and next steps in joint ventures.

Primary points of contact:

- **For CALIFORNIA OLIVE COMMITTEE:**
  Name: Michael Silveira
  Title: Chairman
  Email: silveiraolive@hotmail.com
  Phone: 559-456-9096

  Or

Name: Todd Sanders
Title: CEO – California Olive Committee
Email: Tsanders@calolive.org
Phone: 559-456-9096

- **For CALIFORNIA BLUEBERRY COMMISSION**

  Name: Briana Lagomarsino
  Title: Chairwoman
  Email: Briana@lagomarsino.com
  Phone: 559-221-1800

  Or

  Name: Todd Sanders
  Title: CEO – California Blueberry Commission
  Email: tsanders@calblueberry.org
  Phone: 559-221-1800

5. Duration

This MOU is effective upon the date of signing and will remain in effect for one year, unless terminated by either party as outlined below.

6. Amendments

This MOU may be amended by mutual written consent of both parties. Any amendments shall be signed and attached to this original MOU.

7. Termination

Either party may terminate this MOU by providing 90 days' written notice to the other party. Upon termination, both parties agree to work in good faith to conclude or transition any ongoing projects. The Committee, as well as the Secretary of Agriculture, may terminate the agreement and be relieved of payment obligations. The Committee and USDA reserve the right, at their discretion and for any reason deemed sufficient, to cancel or modify the agreement after the date of signature. In such event, it is agreed that the Committee is liable for all commitments made prior to cancellation or modification and shall reimburse the Agency for all reasonable amounts due or owing in accordance with this contract at the time of said termination.

8. Non-Binding Agreement

This MOU is a non-binding agreement and does not constitute a legally enforceable contract. It serves as a statement of the parties' intent to collaborate and does not obligate either party to a legal commitment.

9. Non-Discrimination/Civil Rights

The California Olive Committee and California Blueberry Association (CBA) agree that, during the performance of this Agreement, they will not discriminate against any employee or applicant for employment because of race, color, national origin, religion, sex, age, disability, protected genetic information, or reprisal. The California Olive Committee and California Blueberry Association further agree that they will fully comply with any and all applicable Federal, State, and local equal employment opportunity statutes, ordinances, and regulations, including, but not limited to, Title VII of the Civil Rights Act of 1964, the Americans with Disabilities Act of 1990, the Age Discrimination in Employment Act of 1967, Genetic Information Act of 2008, and the Equal Pay Act of 1963. Nothing in this section shall require the California Olive Committee and California Blueberry Association to comply with or become liable under any law, ordinance, regulation, or rule that does not otherwise apply to the Committee.

10. Records
Accurate records, books, and documents must be kept involving transactions relating to this agreement. These records, books, and documents must be retained for three (3) years. These records, books, and documents may be subject to inspection and audit by a representative of the USDA, the California Olive Committee, or both.

11. Prohibited Activities
The California Blueberry Association (CBA) agrees it will not engage in lobbying efforts or other prohibited activities on behalf of the California Olive Committee. No funds paid by or to the California Olive Committee shall be used for the purpose of attempting to influence any government policy or any governmental action.

12. Confidentiality
California Blueberry Association (CBA) understands that the California Olive Committee is a federal marketing order subject to the Agricultural Marketing Agreement Act of 1937 (Act) and related regulations. Federal law and regulations require the California Olive Committee to maintain in confidence any and all proprietary and trade secret information. As such, California Blueberry Association agrees, represents, and warrants that all proprietary and trade secret information shall be received and handled only by California Blueberry Association. Any and all officers, employees, and agents of the California Olive Committee and California Blueberry Association shall each keep and maintain all information obtained as a result of this Agreement confidential to the extent required by the USDA.

13. Signatures
By signing below, both parties agree to the terms outlined in this MOU.

Michael Silveira	Todd Sanders
Chairman – California Olive Committee	CEO - California Blueberry Commission

Memorandum of Understanding (MOU)
Between
CALIFORNIA OLIVE COMMITTEE (COC)
And
CALIFORNIA WILD RICE ADVISORY BOARD (CWRAB)

Effective Date: 11/1/2024

1. Purpose

This Memorandum of Understanding (MOU) sets forth the terms and understanding between COC and CWRAB to collaborate on projects and programs that mutually benefit both organizations.

The purpose of this MOU is to increase the efficiency of their independent organizations which engage in similar activities for the California olive and wild rice industries, respectively. Ultimately, this MOU will establish a partnership that will pool resources and lower cost for each individual organization. Through this collaboration, both organizations aim to lower costs and achieve intended results or impact with each individual program. Each organization, shall take all reasonable steps to ensure that COC expenses are paid directly from COC funds and CWRAB expenses are paid directly from CWRAB funds. However, to the extent any expenses are incurred each respective organization (CWRAB and COC) shall reimburse each other for all actual expenses incurred by one another on the others behalf.

2. Background

Being the both the COC and CWRAB have similar missions to promote, research, and educate on behalf of their respective commodities, collaboration is important and prudent from a cost sharing perspective. Due to both the COC and CWRAB being managed by the California Apple Commission (CAC), ease and coordination between the programs is significantly easier and efficient.

3. Joint Responsibilities

Both COC and CWRAB agree to:

- Collaborate in good faith to achieve the goals outlined in this MOU.
- Share relevant data, information, and resources as needed for the success of the collaborative projects.
- Share additional joint responsibilities, such as funding arrangements, travel expenses, and resource allocation

4. Communication

The parties agree to maintain open and regular communication regarding the progress and status of the collaborative projects or ventures. Both Boards will be updated on challenges, progress, and next steps in joint ventures.

Primary points of contact:

- **For CALIFORNIA OLIVE COMMITTEE:**
  Name: Michael Silveira
  Title: Chairman
  Email: silveiraolive@hotmail.com
  Phone: 559-456-9096

  Or

Name: Todd Sanders
Title: CEO – California Olive Committee
Email: Tsanders@calolive.org
Phone: 559-456-9096

- **For CALIFORNIA WILD RICE ADVISORY BOARD**

  Name: Leslie Boyle
  Title: Chairwoman
  Email: leslie@alturasranches.com
  Phone: 559-578-8073

  Or

  Name: Todd Sanders
  Title: CEO – California Wild Rice Advisory Board
  Email: tsanders@calwildrice.org
  Phone: 559-578-8073

5. Duration

This MOU is effective upon the date of signing and will remain in effect for one year, unless terminated by either party as outlined below.

6. Amendments

This MOU may be amended by mutual written consent of both parties. Any amendments shall be signed and attached to this original MOU.

7. Termination

Either party may terminate this MOU by providing 90 days' written notice to the other party. Upon termination, both parties agree to work in good faith to conclude or transition any ongoing projects. The Committee, as well as the Secretary of Agriculture, may terminate the agreement and be relieved of payment obligations. The Committee and USDA reserve the right, at their discretion and for any reason deemed sufficient, to cancel or modify the agreement after the date of signature. In such event, it is agreed that the Committee is liable for all commitments made prior to cancellation or modification and shall reimburse the Agency for all reasonable amounts due or owing in accordance with this contract at the time of said termination.

8. Non-Binding Agreement

This MOU is a non-binding agreement and does not constitute a legally enforceable contract. It serves as a statement of the parties' intent to collaborate and does not obligate either party to a legal commitment.

9. Non-Discrimination/Civil Rights

The California Olive Committee and California Wild Rice Advisory Board (CWRAB) agree that, during the performance of this Agreement, they will not discriminate against any employee or applicant for employment because of race, color, national origin, religion, sex, age, disability, protected genetic information, or reprisal. The California Olive Committee and California Wild Rice Advisory Board further agree that they will fully comply with any and all applicable Federal, State, and local equal employment opportunity statutes, ordinances, and regulations, including, but not limited to, Title VII of the Civil Rights Act of 1964, the Americans with Disabilities Act of 1990, the Age Discrimination in Employment Act of 1967, Genetic Information Act of 2008, and the Equal Pay Act of 1963. Nothing in this section shall require the California Olive Committee and California Wild Rice Advisory Board to comply with or become liable under any law, ordinance, regulation, or rule that does not otherwise apply to the Committee.

10. Records
Accurate records, books, and documents must be kept involving transactions relating to this agreement. These records, books, and documents must be retained for three (3) years. These records, books, and documents may be subject to inspection and audit by a representative of the USDA, the California Olive Committee, or both.

11. Prohibited Activities
The California Wild Rice Advisory Board (CWRAB) agrees it will not engage in lobbying efforts or other prohibited activities on behalf of the California Olive Committee. No funds paid by or to the California Olive Committee shall be used for the purpose of attempting to influence any government policy or any governmental action.

12. Confidentiality
California Wild Rice Advisory Board (CWRAB) understands that the California Olive Committee is a federal marketing order subject to the Agricultural Marketing Agreement Act of 1937 (Act) and related regulations. Federal law and regulations require the California Olive Committee to maintain in confidence any and all proprietary and trade secret information. As such, California Wild Rice Advisory Board agrees, represents, and warrants that all proprietary and trade secret information shall be received and handled only by California Wild Rice Advisory Board. Any and all officers, employees, and agents of the California Olive Committee and California Wild Rice Advisory Board shall each keep and maintain all information obtained as a result of this Agreement confidential to the extent required by the USDA.

13. Signatures
By signing below, both parties agree to the terms outlined in this MOU.

Michael Silveira	Todd Sanders
Chairman – California Olive Committee	CEO – CA Wild Rice Advisory Board

****ACTION REQUIRED****

FROM: COC EXECUTIVE SUBCOMMITTEE

SUBJECT: APPROVAL OF 2025 ADMINISTRATIVE BUDGET

RECOMMENDATION: THAT the Committee adopt the General Administration 2025 FY Budget.

BACKGROUND: The following is the General Administration Budget for the California Olive Committee. Exports are separated.

Staff has put together a history of previous Executive Committee Budgets.

FISCAL YEAR	*2025*	*2024*	*2023*	*2022*	*2021*
ADMIN	$344,450	$350,250	$399,700	$390,700	$357,800
$ Change	$(6,800)	$(49,450)	$9,000	$32,000	$(100,000)
Exports	$165,650	$164,650	$148,000	$148,000	$173,500
$ Change	$1,000	$16,650	-	$(25,500)	-
MAP/EMP/RAPP	$4,387,883**	$1,021,656	$380,480	$422,325	$318,529
$ Change	$3,366,227	$641,176	$(41,845)	$103,796	$(48,870)

**This total reflects the amount of MAP/EMP/RAPP funds applied for the 2025 fiscal year through USDA-FAS. The actual allocations will be announced until passage of a Farm Bill. 2024 allocations will carry over into 2025.

The Sub-Committee must decide:

1) Approval of the 2025 Fiscal Budget

FISCAL IMPACT: $510,100 for FY 2025

GENERAL ADMINISTRATION BUDGET	Budget 2024	Budget 2025	Diff.
California Apple Commission	$ 240,000.00	$ 240,000.00	$ -
Bookkeeper	$ 12,500.00	$ 12,500.00	$ -
Audit Fee	$ 8,500.00	$ 9,000.00	$ 500
Travel-Office	$ 12,000.00	$ 12,000.00	$ -
Crop Estimate (NASS)	$ 7,800.00	$ 10,000.00	$ 2,200
Travel - Committee	$ 20,000.00	$ 15,000.00	$ (5,000)
Insurance - General	$ 3,000.00	$ 3,000.00	$ -
Printing - Admin	$ 6,500.00	$ 4,500.00	$ (2,000)
Travel Insurance	$ 1,500.00	$ 1,500.00	$ -
Office supplies	$ 2,000.00	$ 2,000.00	$ -
Postage/Shipping	$ 4,500.00	$ 3,000.00	$ (1,500)
Equipment, Software,Furniture	$ 1,200.00	$ 1,200.00	$ -
Misc. Admin Expense	$ 1,500.00	$ 1,500.00	$ -
Storage	$ 750.00	$ 750.00	$ -
Insurance - Members/Management	$ 3,000.00	$ 3,000.00	$ -
Maintenance	$ 500.00	$ 500.00	$ -
Attorney/Crisis Comm	$ 25,000.00	$ 25,000.00	$ -
Education Training	$ -	$ -	$ -
Strat Plan/Contingency Fund	$ -	$ -	$ -
TOTAL	$ 350,250.00	$ 344,450.00	$ (5,800)

TOTAL FOR G&A =
Total for Exports =
TOTAL =

	Budget 2024	Budget 2025	DIFF
EXPORTS:			
Asia Logistica	$ 9,000.00	$ 7,500.00	$ (1,500)
Industry Relations	$ 8,000.00	$ 3,000.00	$ (5,000)
BCI	$ 53,000.00	$ 53,000.00	$ -
Misc.	$ 2,000.00	$ 2,000.00	$ -
FAS/USADEC	$ 3,500.00	$ 5,000.00	$ 1,500
Japan	$ 14,000.00	$ 10,000.00	$ (4,000)
RAPP Markets	$ 10,000.00	$ 10,000.00	$ -
Canada	$ 11,500.00	$ 9,000.00	$ (2,500)
Fruit Attraction	$ 12,000.00	$ 12,000.00	$ -
GBI	$ 7,000.00	$ 7,150.00	$ 150
Management	$ 35,000.00	$ 35,000.00	$ -
RAPP Management	$ -	$ 12,000.00	$ 12,000
			$ -
TOTAL	$ 165,000.00	$ 165,650.00	$ 650

MAP DOLLARS

CANADA	$ -	$ -
MEXICO	$ -	$ -
JAPAN	$ -	$ -
SE ASIA	$ -	$ -
TOTAL	$ -	$ -

EMP

India	$ -	$ -
China	$ -	$ -
Mexico	$ -	$ -
Canada	$ -	$ -
TOTAL	$ -	$ -

ATP

UK	$ -	$ -
SE ASIA	$ -	$ -
TOTAL	$ -	$ -

TOTAL MAP/EMP/ATP/TASC $ - $ -

MAP/EMP/ATP/TASC are all reimbursable dollars

****ACTION REQUIRED****

FROM: COC EXECUTIVE SUBCOMMITTEE

SUBJECT: INTER-ITEM TRANSFERS OF THE EXECUTIVE BUDGET

RECOMMENDATION: THAT the Committee grant authority to the Executive Director and Chairman for inter-item transfers of the Executive Budget.

****ACTION REQUIRED*****

FROM: COC INSPECTION SUBCOMMITTEE

SUBJECT: APPROVAL OF 2025 INSPECTION BUDGET

RECOMMENDATION: THAT the Committee adopt the Inspection Budget for the 2025 FY and delegate the authority to the Subcommittee to utilize the contingency fund.

BACKGROUND:

For the 2025 FY, the following items are expenditures for the Inspection program.

1. Travel - $3,000
2. OERS Maintenance - $25,000
3. Optical Sizer (Misc. as needed) - $15,000
4. 2025 Weekly Receipts - $2,000
5. Contingency - $20,000

Staff has put together a history of previous Inspection Subcommittee Budgets.

2024 FY Line-Item Budget Breakout:

1. Travel - $3,000
2. OERS Maintenance - $25,000
3. Optical Sizer (misc. as needed) - $15,000
4. 2024 Weekly Receipts - $2,000
5. Contingency - $40,000

FISCAL YEAR	*2025*	*2024*	*2023*	*2022*	*2021*
Inspect	$65,000	$85,000	$88,000	$42,900	$48,000
Differ	$(20,000)	$(3,000)	$45,100	$(5,100)	$(7,000)

The Subcommittee must decide:

1) Approval of the 2025 Inspection Budget

FISCAL IMPACT: $65,000 for FY 2025

******ACTION REQUIRED******

FROM: COC INSPECTION SUBCOMMITTEE

SUBJECT: INTER-ITEM TRANSFERS OF THE INSPECTION BUDGET

RECOMMENDATION: THAT the Committee grant authority to the Executive Director and Chairman for inter-item transfers of the Inspection Budget.

****ACTION REQUIRED*****

FROM: COC MARKETING SUBCOMMITTEE

SUBJECT: APPROVAL OF 2025 MARKETING PLAN AND BUDGET

RECOMMENDATION: THAT the Committee adopt the Marketing Budget for the 2025 FY and delegate authority to the Subcommittee to utilize the contingency.

BACKGROUND: Each year, the Marketing Subcommittee approves a marketing plan.

The Committee needs to approve Internal Marketing Programs totaled at $57,500.00.

1. Internal Marketing Programs - $57,500.00
    a. CA Grown
    b. Partnerships
    c. Travel
    d. Olive Day
    e. Trade Show IFPA
    f. Social Media Promotions
    g. Website Maintenance

Additionally, the Committee can decide to approve additional external marketing programs to conduct further marketing and promotional activities in 2025. The following pages contains an updated plan for the contingency funds.

	Budget
CA Grown Opt Ins	$75,000.00
Contingency	$75,000.00
Total:	**$150,000.00**

FISCAL YEAR	**2025**	**2024**	**2023**	**2022**	**2021**
MARKETING	$207,500	$197,500	$193,000	$200,000	$238,000
Difference	$10,000	$4,500	$(7,000)	$(38,000)	$114,500

FISCAL IMPACT: $207,500 for the 2025 FY.

Marketing Contingency

- Budget: **$75,000**
- Proposed Activity: Cal Ripe Olive Educational Seminar
  - Audience: Retail Buyers
  - Objective: Promote Cal Ripe Olives to a selected audience of retail buyers to show the versatility and quality, through an interactive educational seminar which will include a tasting experience and will incorporate olives into a three course meal.
  - Grower Members can attend to speak about our product!
  - The COC will conduct at least two events in Northern CA and Southern CA to attract as many retail buyers as possible. Events can be coordinated in conjunction with conferences/tradeshows like California Grocers Association in Palm Springs or The Global Floral and Produce Show in Anaheim.


Marcum Olive
BOCCABELLA

****ACTION REQUIRED****

FROM: COC MARKETING SUBCOMMITTEE

SUBJECT: INTER-ITEM TRANSFERS OF THE MARKETING BUDGET

RECOMMENDATION: THAT the Committee grant authority to the Executive Director and Chairman for inter-item transfers of the Marketing Budget.

****ACTION REQUIRED****

FROM: COC RESEARCH SUBCOMMITTEE

SUBJECT: APPROVAL OF 2025 BUDGET

RECOMMENDATION: THAT the Subcommittee approve various research projects for 2025.

BACKGROUND:

Each year the Research Subcommittee approves various research projects funded by the Full Committee. The Subcommittee must determine which proposed projects to recommend to the Full Committee for funding. An estimated budget of **$392,097** (with no-cost extensions) is proposed based on the submitted projects.

#	Researcher	Project	11.13.24 Amount	12.19.24 Amount
1	Dr. Jim Adaskaveg*	Epidemiology and management of olive knot caused by Pseudomonas savastanoi pv. Savastanoi (year 1)	$15,490	$15,490
2	Rodrigo Almeida Franklin Lewis	Survey of Xylella fastidiosa genetic diversity within California olive trees (year 2)	$30,361	**$31,151**
3	Georgia Drakakaki and Becky Wheeler-Dykes**	Evaluation of effects of Accede® (ACC) at two different application rates on enhancing horticultural maturity and abscission zone development and commercial trunk shaking efficiency in table olives (year 3)	$115,129.20	$115,129.20
4	Dr. Carol Lovatt and Elizabeth Fichtner	Integrating Alternate Bearing Mitigation Strategies in a Commercial Table Olive Orchard (year 3)	$29,156	**$34,984**
5	Elizabeth Fichtner	Designing a web app for predicting risk of olive fruit fly—a tool for California olive growers and pest control advisors	$19,860	$19,860
6	Franklin Lewis	Development of screening tools to determine Xylella fastidiosa tolerance in olives	$10,443	-
8	Nicholas Manoukis	New prospects for the control of black scale in California olive groves	$73,000	$73,000
10	Ernie Simpson	Sacramento Valley Olive Fruit Fly Monitoring Project	$12,500	$12,500
11	Jim Stewart	Southern San Joaquin Valley Olive Fruit Fly Monitoring Project	$12,000	$12,000
	2024 NCE-Carol Lovatt	Integrating Alternate Bearing Mitigation Strategies in a Commercial Table Olive Orchard	$13,530	$13,530
	2024 NCE-Drakakaki	Evaluation of effects of Acceede (ACC) on tree architecture, and harvester type on enhancing horticultural maturity and abcission zone development and commercial trunk shaking efficiency in table olives	$52,552	$52,552

	2024 NCE-Rodrigo Almeida	Survey of Xylella fastidiosa diversity within California olive trees	$11,900.80	$11,900.80
		Contingency Fund	$0	$0
		Total with No-Cost Extensions	**$395,742**	**$392,097**
		Total without No-Cost Extensions	**$317,939.20**	**$314,114.20**

*The COC traditionally co-funds this project with the OOCC.
**The COC will ask Valent if they are able to contribute any funds to reduce the fiscal impact as they did in 2024.

Project title
Survey of *Xylella fastidiosa* genetic diversity within California olive trees

Principal Investigator (PI)
Rodrigo P.P. Almeida
Professor & Hildebrand-Laumeister Chair in Plant Pathology
Department of Environmental Science, Policy and Management, 130 Mulford Hall
Rausser College of Natural Resources, University of California, Berkeley; Berkeley, CA, 94720
e-mail: rodrigoalmeida@berkeley.edu

Co-Principal Investigators (co-PIs)
Franklin Lewis
Assistant Specialist
Plant Sciences, UC Davis
One Shields Ave, Davis CA 95616
e-mail: flewis@ucdavis.edu

Pat J Brown
Associate Professor
Plant Sciences, UC Davis
One Shields Ave, Davis CA 95616
e-mail: pjbrown@ucdavis.edu

Objective(s) of Proposed Research:
This proposed project directly addresses the research priorities associated with the risks of *Xylella fastidiosa* disease to California olive production. Our objectives are as follows:

Objective 1 - Evaluate *X. fastidiosa* genetic diversity in olive trees in Southern California.

Objective 2 - Identify environmental variables associated with high *X. fastidiosa* diversity to inform future risk assessments.

Objective 3- Establish *in vitro* cultures of putatively resistant and susceptible olive varieties

This research was initiated in 2024 with COC funding for one year. Field work started in the summer as pathogen populations within plants are higher at that time of the year, and disease symptoms are more severe. We collected more samples from olive trees for testing than originally proposed, and over one-third of those were positive for *X. fastidiosa*. We are now working on genotyping the positive samples, as described in the original proposal; the project is moving forward as proposed. The goal for this second year is to expand the area sampled so that a representative sampling of the *X.* fastidiosa-olive disease problem in California is obtained, and to initiate work on possible biotic and abiotic correlates that may relate to disease. Objective 3 is a new objective led by the UC Davis research group.

Justification and Importance of Proposed Research:
Ornamental olive trees in Southern California urban forests may be incubators for novel pathogenic strains of *X. fastidiosa*. The goal of this study is to survey the genetic diversity of *X. fastidiosa* strains that are currently present in urban olive trees and assess their risk to California's commercial olive industry. Additionally, non-olive plant hosts house an extensive reservoir of *X. fastidiosa* genotypic and phenotypic diversity, which represent an unquantified threat to the emerging olive oil industry in California. Very little known about *X. fastidiosa* infecting plants outside of commercial agriculture settings, especially for trees in Southern California where the pathogen is abundant throughout the landscape (Lee & Almeida, unpublished data). Current *X. fastidiosa* infections in ornamental olives in urban and suburban landscapes may be the source of future spillover onto commercial olive orchards. In 2024 *X. fastidiosa* was frequently detected in olive trees throughout San Diego and Los Angeles counties, suggesting that the pathogen's distribution is broader than previously described. Pervasive infections of olive trees may select for more virulent genotypes of *X. fastidiosa*, posing an even greater risk to California's olive production. This project will be the first to provide a robust assessment of *X. fastidiosa* strains causing disease in ornamental olives. This work will critically evaluate the risk *X. fastidiosa* in urban forests poses to California olive production.

In vitro screening tools have been utilized for other pathogens such as *Erwinia amylovora* (Viseur et al 1986), *Phytophthora pini* (Zaini et al 2021), *Fusarium oxysporum* (Parris et al 2024) and especially challenging to evaluate field pathogens such as *Armillaria mellea* (Baumgartner et al 2013, Adelberg et al 2021), and on curative controls of phytoplasma (Tanno et al 2018). Based on the growing number of *in vitro* assays for rapid pathogen tolerance screening, we expect that protocols to screen olive germplasm and cultivars for tolerance to *X. fastidiosa* should be possible. There is a lack of domestic expertise in propagating olive cultivars in vitro which has limited the ability to generate in vitro screening and tolerance tools and inhibited the ability of partners such as Foundation Plant Services (FPS) to import new cultivars or perform virus elimination. Optimizing protocols for maintaining cultivars important to California would be shared with FPS. This should facilitate the development of protocols in the future to create clean, virus-free, plant materials of currently inaccessible varieties of table olives such as Manzanilla Cacereña which are currently unable to be released from quarantine due to the presence of detectable viral particles.

Previous work
Xylella fastidiosa is a vector-borne plant pathogenic bacterium that infects over 720 plant species. There are three well-established subspecies of *X. fastidiosa*, and within each subspecies there are many genotypes of the pathogen associated with different plant diseases (Kahn et al. 2022). *X. fastidiosa* outbreaks are threatening the health of olive trees across the globe. The emergence of olive quick decline syndrome (OQDS) in Italy serves as the most severe example of a *X. fastidiosa* epidemic seriously disrupting agricultural olive production. Olive orchards in the Apulia region have been devastated following the introduction of *X. fastidiosa* subspecies *pauca* and the first report of disease just one decade ago (Sicard et al. 2021). Subsequent detections and accounts of olive disease have also been reported in Spain and France (Amandine et al. 2022, Landa et al. 2018). Although the outbreak in Italy was caused by a single genotype of *X. fastidiosa* subsp. *pauca* and resulted in severe disease emergence, the detection of *X. fastidiosa* subsp. *multiplex* in Spain and France is associated with only mild symptoms (Amandine et al. 2022, Landa et al. 2018). The complex ecology of *X. fastidiosa* in Europe

illustrates the need to identify potentially pathogenic strains of *X. fastidiosa* in the landscape before they generate devastating outbreaks.

The emergence of disease in South American olives also demonstrates the necessity of this approach. Phylogenetic analysis revealed genetically distinct *X. fastidiosa* subsp. *pauca* strains causing disease in olive in Argentina and Brazil (Haelterman et al. 2015, Tolocka et al. 2022, Donegan et al. 2023). Analysis in Argentina has revealed two distinct genetic varieties (ST78 and ST69), whereas only one has been described in Brazil so far (ST16; although more are known but have not been published yet) (Haelterman et al. 2015, Tolocka et al. 2022, Donegan et al. 2023). The symptoms caused by the strains isolated in Brazil also closely resemble those reported in Italy (Coletta-Filho et al. 2016), although the strains infecting olive in Italy (ST53) and in Brazil are not closely related. In summary, there are currently numerous genetic groups of *X. fastidiosa* causing disease in olive trees across the globe. Without timely monitoring of *X. fastidiosa* outbreaks and the knowledge of the genetic diversity present in a region, it will be impossible to assess the threat it poses to future olive production.

The effect of *X. fastidiosa* in California olive trees is a generally understudied phenomenon, particularly at the landscape scale. *X. fastidiosa* became abundant throughout Southern California as a result of the introduction of the glassy-winged sharpshooter (*Homalodisca vitripennis*) in the late 1990s (Blua & Morgan 2003). The glassy-winged sharpshooter is the main vector for Pierce's disease of grapevines in Southern California, oleander leaf scorch, and disease in a variety of ornamental hosts (Almeida & Purcell. 2003, Purcell et al. 1999, Wong et al. 2006). The meadow spittlebug (*Philaenus spumarius*) - a naturalized insect vector - has also been identified as an important vector in California (Beal et al. 2021). The broad proliferation of *X. fastidiosa* throughout Southern California now poses an unknown risk to California olive producers.

Olive trees remain as an understudied host species despite frequent reports of disease in the urban forests of major cities; ornamental olive trees used in urban and suburban landscaping have been known hosts of *X. fastidiosa* for years. Most of the isolates from olive in Southern California so far belong to *X. fastidiosa* subsp. *multiplex* (O'Leary et al. 2020, Krugner et al. 2014, Nunney et al. 2019), a different subspecies than what is responsible for the outbreak in Apulia, but the same as those in Spain and France. A second subspecies (subsp. *sandyi*) was also recovered from an olive tree in Irvine (O'Leary & Burbank 2022). In fact, the varieties of subsp. *multiplex* in Spain and France are closely related to those present in California, where they originated from (Landa et al. 2020, Kahn et al. 2022). Greenhouse inoculation studies have demonstrated that the established strains from Southern California only exhibit mild pathogenicity over a one-year study period (Krugner et al. 2014). However, our research group observed severe leaf scorch, stunting, and branch disease in *X. fastidiosa*-positive olives during both our 2023 pilot study and subsequent follow-up work in 2024. It is also clear that only a fraction of the *X. fastidiosa* strains in Southern California have been adequately described.

In addition to unknown levels of genetic diversity, it is unclear what role that climate conditions and landscape features play in the proliferation of *X. fastidiosa* in Southern California olive trees. *X. fastidiosa* appears to respond to a number of environmental variables. Increasing the temperature of insect vector enclosures in greenhouse conditions led to a higher proportion of diseased grapevines in one study (Daugherty et al. 2017). Our lab group has also demonstrated that some strains of *X. fastidiosa* are adapted to local climate conditions - specifically their tolerance to low winter temperatures (Almeida, unpublished data). The effect of environmental

variables on *X. fastidiosa'*s disease progression in California olive trees has gone completely untested, and could be vital for predicting high-risk areas for olive production.

In Europe, remote sensing technologies (GIS, Google Earth Engine, etc.) are being used to quantify the incidence of *X. fastidiosa* infections on the landscape (Hornero et al. 2018, Maggiore et al. 2019). This approach could be expanded to elucidate environmental variables that are correlated with specific *X. fastidiosa* genotypes. At a minimum, remote sensing technologies can be used to annotate the landscape into relevant cover types (e.g. riparian, forest, desert). This can be overlaid with *X. fastidiosa* diversity data to identify correlations between specific ecosystem types and high strain diversity, which could help identify high-risk areas for olive growers in the future. Quantifying broad ecosystem variables using remote sensing technologies will help identify landscape features that increase *X. fastidiosa* strain diversity.

This study will be the first systematic evaluation of the genetic diversity of olive-associated *X. fastidiosa* strains in California. This work can be used to generate more accurate risk assessments for the California olive industry, as well as to guide future research on this problem.

Work completed 2024:

Although the genetic typing of these *X. fastidiosa* strains is still in progress, our data suggest that urban forests may be an even greater reservoir of olive-associated *X. fastidiosa* strains than previously thought. While diagnostic testing of this field season's samples has not concluded, over one-third of all olive trees screened for *X. fastidiosa* thus far have tested positive. This is approximately 2-3 times the incidence reported in similar studies with *X. fastidiosa* conducted in urban forests (Harris et al. 2014) and semi-rural landscapes (Olmo et al. 2021). Symptomatic olive trees were observed throughout wide ranging climates in San Diego County and were also abundant in a preliminary collection effort in Los Angeles in 2024 (Figure 1). The prolific incidence and widespread geographic range of *X. fastidiosa*-olive disease in Southern California reinforces the urgency of our proposed study.

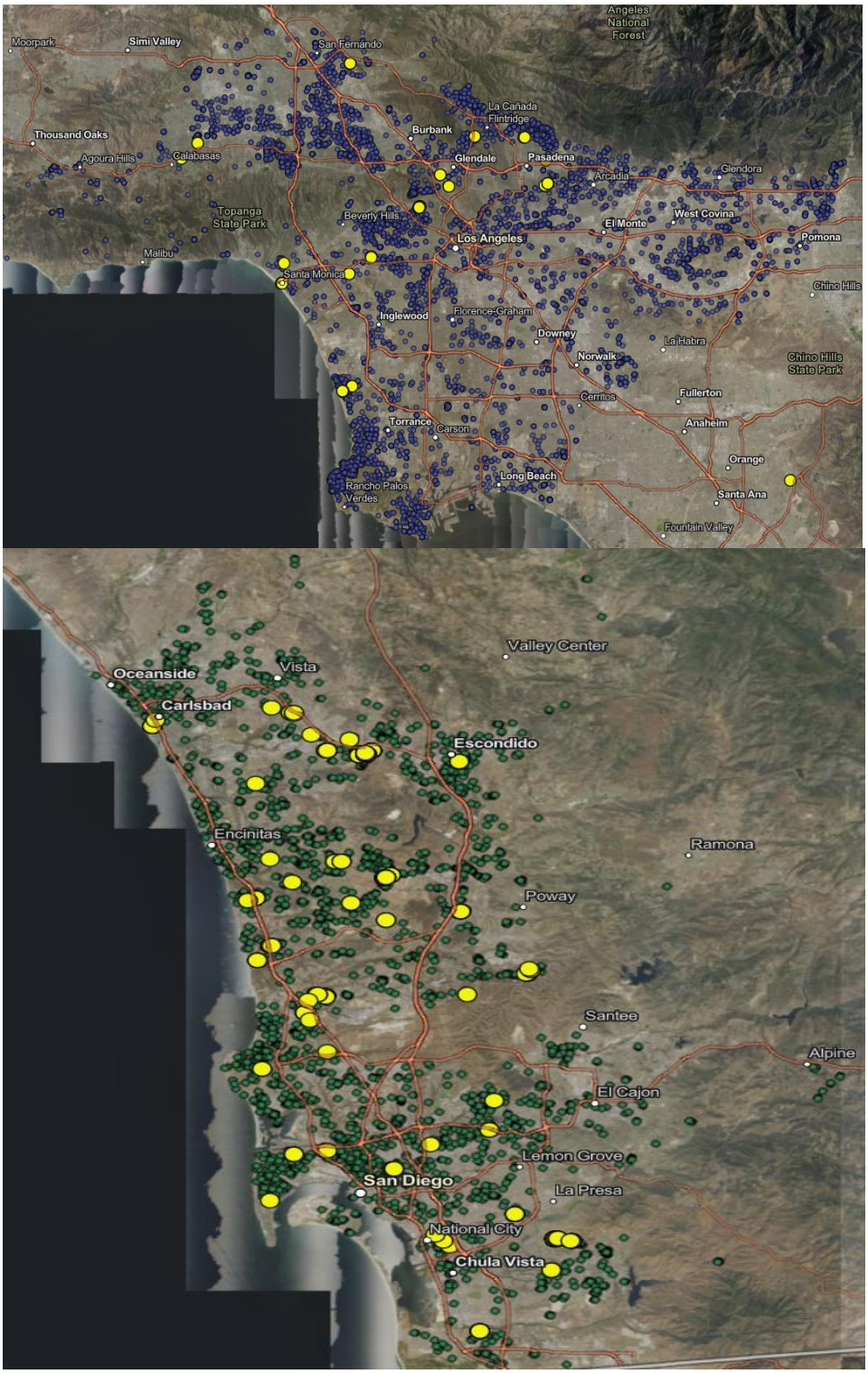

Figure 1: Distribution of samples collected in 2024. Yellow dots represent individual olive tree sampled. Blue dots represent the locations of olive trees in Los Angeles County (top) and green dots represent the locations of olive trees in San Diego County (bottom).

Procedures to Accomplish Objective(s)

Aim 1: Collect field samples from trees throughout Southern California

Symptomatic olive trees will be sampled following established protocols widely used in the surveillance of *X. fastidiosa* outbreaks in Europe (EPPO 2018). Additionally, precise location of each tree will be recorded through GIS platform Survey123 (ESRI). Site selection will be determined by expert knowledge of commercial arborists in Southern California, and UC Cooperative Extension specialists working locally. Sites will have a strong emphasis on areas with dense olive plantings and/or are adjacent to commercial olive orchards. Our lab group recently acquired the precise GPS location of all urban olive trees in Southern California (Love et al. 2022), which in turn has made sampling efforts more precise and efficient. We expect to collect over 300 samples in 2025.

Samples will be shipped to our lab facilities at UC Berkeley for their immediate processing. Non-olive tree species growing in proximity to diseased olives may be sampled to provide a more comprehensive understanding of the genetic diversity of *X. fastidiosa* throughout the landscape. Novel strains that could potentially infect olive trees may be detected by this approach.

Aim 2: Genetic typing of *X. fastidiosa* strains

Samples will undergo DNA extraction and purification from plant petioles using DNeasy plant mini kits (Qiagen) upon their arrival at UC Berkeley. A universal primer set as described in Harper et al. (2010) will be used to detect positive *X. fastidiosa* isolates via real-time quantitative PCR. Live *X. fastidiosa* colonies will also be cultured on PWG media following established protocols (Hill and Purcell 1995). We propose to use two methods to genotype *X. fastidiosa* from olive trees. If we are able to culture cells in the laboratory, we will sequence the complete genome of those strains. Our group has sequenced and analyzed the genomes of several hundred *X. fastidiosa* strains (e.g. Vanhove et al. 2020, Kahn et al. 2022, Donegan et al. 2023), and we do not expect issues, other than the fact that we do not know how many strains we will obtain in pure cultures. The alternative method is to use multi-locus sequence typing by obtaining *X. fastidiosa* genotype information from total DNA extractions, which is widely used for the identification and typing of this pathogen in quarantine situations (e.g. Loconsole et al. 2016). MLST uses the sequence information from seven house-keeping genes, and it will distinguish genotypes of *X. fastidiosa* successfully. We also have experience generating and analyzing MLST data (e.g. Almeida et al. 2008, Kahn et al. 2022). Whole-genome sequences are more informative, but are limited by the number of live *X. fastidiosa* isolates we are able to obtain. Either approach will allow us to untangle the evolutionary relationships between *X. fastidiosa* strains in Southern California with a high degree of specificity, and neither whole-genome sequencing or MLST has been systematically conducted for *X. fastidiosa* in olives in Southern California before this study.

Aim 3: Remote sensing analysis

Various remote sensing and spatial ecology methods will be used to map the distribution of positive *X. fastidiosa* cases and determine associations between environmental variables and pathogen genotype. Widely available satellite imagery datasets such as Landsat 8 platform use infrared sensors to directly measure surface temperature and other wavelengths of light that can be used to calculate key bioclimatic variables without the need to deploy individual weather

stations. A series of raster images will be generated from this dataset using Google Earth Engine, a powerful open-source remote sensing analysis platform. These raster images will map the variation in key bioclimatic (annual mean temperature, precipitation, etc.) and spectral (greenness, amount of developed space) variables across Southern California. Remote sensing technologies have been used to explore the links between climate and *X. fastidiosa* infections even at fine spatial scales (Hornero et al. 2018).

The raster values at GPS coordinates for symptomatic trees will be extracted to determine the specific microclimatic conditions at each site. A robust series of R packages (Terra, Raster, etc.) are available to manipulate raster data and calculate these values. Statistical analysis will then be performed to examine if bioclimatic variables are highly correlated with pathogen incidence and specific *X. fastidiosa* genotypes. The climate conditions of areas where olive trees are currently affected by *X. fastidiosa* can then be compared to regions of California where olive production is projected to increase to generate risk assessments. GIS and other geospatial analysis software can also be used to divide regional maps up into relevant subclasses (farmland, riparian, developed, etc.). *X. fastidiosa* diversity data could be then overlaid with these maps to demonstrate associations between specific ecosystem types and higher *X. fastidiosa* strain diversity. Such an approach is already being used to infer the range and population dynamics of *X. fastidiosa* insect vectors (Santoiemma et al. 2019) Implementing this analysis in the urban context - where the landscape use often is highly variable and spatially fragmented – will help identify ecosystems that retain higher numbers of distinct *X. fastidiosa* strains. Once this is complete, the urban forestry inventory data aggregated through the method of Love et al. (2022) could be used to identify areas where high *X. fastidiosa* diversity may be predicted based on both ecosystem type and olive abundance. In summary, remote sensing tools would help elucidate potential *X. fastidiosa* hotspots where olive production should be avoided.

Aim 4: Establish clean in vitro cultures of olives from disinfested field and/or greenhouse material

Field and greenhouse materials sourced from germplasm and commercial partners will be disinfested with either sodium hypochlorite bleach or sodium dichloroisocyanurate (NaDCC) and introduced to in vitro conditions. Our collaborators in the lab of Cristian Silvestri, at the University of Tuscia Viterbo, IT, have developed protocols for introducing and maintaining olive shoot cultures in vitro and will be a primary consultation source for troubleshooting. They have previously had success creating repetitively embryogenic cultures of olive from various tissue types, a pathway that may be suitable for future non-transgenic molecular tools or transgenic approaches should they be desired by the industry to address X. fastidiosa or other problems.

Summary

The proposed project will be the first to systematically quantify the genetic diversity of olive-associated *X. fastidiosa* strains in Southern California. A greater number of olive isolates will be described with a higher degree of genetic fidelity than previous studies. The novel application of remote sensing technology will also help establish existing links between climate and genetic diversity/incidence of *X. fastidiosa* in olive trees. The project will also initiate efforts to propagate economically important olive varieties in vitro. Taken together, these approaches will help generate biologically-informed risk assessments for California olive production.

Timetable for Project

Sample collection for Objective 1 will occur in the Summer and Fall of 2025, while sample processing and analyses will take place in subsequent Winter and Spring months. This is the same schedule we used in 2024; we have recently finished our sample collection trips and subsequently tested most samples for *X. fastidiosa*. The genotyping component of the work initiated recently. This schedule will provide us with two years to collect samples (2024 already done, and 2025), and the focus in 2025 will be under sampled areas or areas where more genetic diversity was detected in 2024. The landscape analysis components of the work require the availability of some of the data, so that computational pipelines can be developed. This work will likely start in Spring 2025, although we expect to focus on Objective 2 towards the end of the project when most/all the data have already been collected. Work on Objective 3 will be perform throughout the duration of the project.

	Spring 2025	Fall 2025	Spring 2026
Obj. 1. Genetic survey		**X**	**X**
Obj. 2. Landscape analyses		**X**	**X**
Obj. 3. Establish *in vitro* cultures	**X**	**X**	**X**
Data analyses, reports		**X**	**X**

Present Outlook and Estimated Success in Accomplishing Objective(s)

Our research group has three decades of experience working on the biology, ecology, and management of *X. fastidiosa* diseases in California and globally, including olive disease in Europe and Brazil. We have done extensive research on the diversity of *X. fastidiosa* using the tools and approaches proposed here, including performing MLST and whole-genome sequence analyses. We previously acknowledged possible difficulties in obtaining cultures from olive trees in California as this has been challenging to colleagues that have pursued similar research; we have found this difficult as well. We are reaching out to colleagues in the US and Europe that have had success obtaining isolates from olive trees, hoping to adapt and improve our protocols.

In 2023 we started working with arborists in San Diego Co. and we were able to sample from that region. Our initial estimates were to collect between 100-200 samples each year. In 2024, as part of our ongoing COC-funded project, we sampled 246 olive trees in southern California, focusing on San Diego County and Los Angeles County. Our lab group got access to the locations of urban olive trees (see Love et al. 2022) midway through our sampling season. This greatly expedited the pace of sampling; thus, we anticipate that we will be able to gather an equal (if not greater) number of samples next year. Approximately 1/3 of all sampled plants were PCR-positive for *X. fastidiosa*, and our group is now genotyping those samples. We attempted to culture live *X. fastidiosa* cells from about 1/3 of olive samples collected (n = 77) but were not successful. *X. fastidiosa* is notoriously challenging to isolate from olive trees. We are leveraging our international network of *X. fastidiosa* specialists to amend our protocols and improve our future success in isolating *X. fastidiosa* cells from olive. Our group is confident that we will be able to expand the scope and success of this research in 2025.

Rodrigo Almeida's brief CV can be found here:
https://nature.berkeley.edu/almeidalab/wp-content/uploads/2023/03/Almeida_2_page_CV.pdf
The publication record of Rodrigo Almeida's group is listed here:
https://nature.berkeley.edu/almeidalab/publications/

Budget Support Summary by Objective(s):

This project proposal, and related work, has not been submitted to any other funding source.

Personnel (~$12,500/year)
The research will be performed by a graduate student that is funded by a National Science Foundation (NSF) fellowship. These are prestigious fellowships that cover stipend, tuition, and fees for the student during the academic year. We request funding to support this student for one month (100% appointment) during each Summer of this project. The student will work on the project throughout the year, not only the one month in the Summer. Student salary and benefits follow required University of California rates.

The tissue culture portion of this research will be performed by an assistant specialist at UC Davis (5% appointment) for the duration of this project. Salary and benefits follow required University of California rates.

Tissue Culture Supplies ($500)
Funds will cover the cost of media salts, hormones, and gelling agents used throughout the duration of the project.

Laboratory supplies and sequencing costs ($10,000/year)
We hope to generate data for 150-200 samples per year: more if technically feasible. The cost of DNA extractions and other materials and reagents is estimated to be $5/sample. Costs for culturing *X. fastidiosa* are estimated to be $2,000/year. The cost of genotyping one sample using MLST is $62 (7 genes, both strands - 14 reads); the cost of genotyping one sample using WGS is ~$140 (Illumina, 100-200x depth of coverage). Ideally we would only use WGS for each sample, but shipped samples may no longer have live cells when we receive them, or culturing we may be very challenging (based on the experience of others). Our estimate of $15,000/year for reagents/sequencing assumes a balance of 150-200 samples genotyped using MLST and/or WGS, in addition to other lab costs. Only after one season will we be able to provide a more accurate estimate of the breakdown of samples typed using MLST and/or WGS.

Travel costs ($4,500/year)
In addition to processing samples mailed to Berkeley, we will also perform three trips annually to collect samples. These trips will allow us to close geographical and landscape gaps in sampling. We estimate travel costs for one week as: flights: $200 per trip (x3) = $600; motel: ~$800 per week (x3) = $2,400; rental car: $500 per week (x3) = $1,500.

GAEL costs
The General, Automobile, and Employment Liability (GAEL) charge was instituted in 1998 to fund the campus's share of expenses associated with claims and lawsuits defended by the University; the GAEL charge is $1.75 per $100 of payroll. This applies to all funds, including gifts and grants, with the exception of direct federal contracts, grants, and flow-throughs. (https://riskservices.berkeley.edu/insurance-programs/liability)

Indirect costs

The program allows for indirect costs not exceeding 11% of the budget, as described in the RFP.

Total Budget Request:

	2025-2026
Personnel (UC Berkeley*)*	$7,373
Personnel (UC Davis)	$5,543
Lab reagents/sequencing costs	$10,000
Tissue culture supplies	$500
Travel expenses	$4,500
GAEL costs	$148
Total direct cost	$28,064
Indirect cost (11%)	$3,087
Total cost	**$31,151**

Literature Cited:Adelberg, J., Naylor-Adelberg, J., Miller, S., Gasic, K., Schnabel, G., Bryson, P., ... & Reighard, G. (2021). In vitro co-culture system for Prunus spp. and Armillaria mellea in phenolic foam rooting matric. *In Vitro Cellular & Developmental Biology-Plant*, *57*, 387-397.

Almeida, R. P. P., & Purcell, A. H. (2003). Transmission of Xylella fastidiosa to Grapevines by Homalodisca coagulata (Hemiptera: Cicadellidae). *Journal of Economic Entomology*, *96*(2), 264–271. https://doi.org/10.1093/jee/96.2.264

Almeida, R. P. P., Nascimento, F. E., Chau, J., Prado, S. S., Tsai, C.-W., Lopes, S. A., & Lopes, J. R. S. (2008). Genetic Structure and Biology of Xylella fastidiosa Strains Causing Disease in Citrus and Coffee in Brazil. *Applied and Environmental Microbiology*, *74*(12), 3690–3701. https://doi.org/10.1128/AEM.02388-07

Beal, D. J., Cooper, M., Daugherty, M. P., Purcell, A. H., & Almeida, R. P. P. (2021). Seasonal Abundance and Infectivity of Philaenus spumarius (Hemiptera: Aphrophoridae), a Vector of Xylella fastidiosa in California Vineyards. *Environmental Entomology*, *50*(2), 467–476. https://doi.org/10.1093/ee/nvaa178

Blua, M. J., & Morgan, D. J. W. (2003). Dispersion of Homalodisca coagulata (Hemiptera: Cicadellidae), a Vector of Xylella fastidiosa, into Vineyards in Southern California. *Journal of Economic Entomology*, *96*(5), 1369–1374. https://doi.org/10.1093/jee/96.5.1369

Baumgartner, K., Fujiyoshi, P., Browne, G. T., Leslie, C., & Kluepfel, D. A. (2013). Evaluating paradox walnut rootstocks for resistance to armillaria root disease. *HortScience*, *48*(1), 68-72.

Coletta-Filho, H. D., Francisco, C. S., Lopes, J. R. S., De Oliveira, A. F., & Da Silva, L. F. D. O. (2016). First report of olive leaf scorch in Brazil, associated with Xylella fastidiosa subsp. Pauca. *Phytopathologia Mediterranea*, *55*(1), 130–135. https://doi.org/10.14601/Phytopathol_Mediterr-17259

Costa, H. S., Raetz, E., Pinckard, T. R., Gispert, C., Hernandez-Martinez, R., Dumenyo, C. K., & Cooksey, D. A. (2004). Plant Hosts of Xylella fastidiosa In and Near Southern California Vineyards. *Plant Disease*, *88*(11), 1255–1261. https://doi.org/10.1094/PDIS.2004.88.11.1255

Donegan, M. A., Coletta-Filho, H. D., & Almeida, R. P. P. (2023). Parallel host shifts in a bacterial plant pathogen suggest independent genetic solutions. *Molecular Plant Pathology*, *24*(6), 527–535. https://doi.org/10.1111/mpp.13316

EPPO PM 7/24(4) *Xylella fastidiosa*. (2019). *EPPO Bulletin*, *49*(2), 175–227. https://doi.org/10.1111/epp.12575

Haelterman, R. M., Tolocka, P. A., Roca, M. E., Guzmán, F. A., Fernández, F. D., & Otero, M. L. (2015). First Presumptive Diagnosis of Xylella Fastidiosa Causing Olive Scorch in Argentina. *Journal of Plant Pathology*, *97*(2), 393–393.

Kahn, A. K., & Almeida, R. P. P. (2022). Phylogenetics of Historical Host Switches in a Bacterial Plant Pathogen. *Applied and Environmental Microbiology*, *88*(7), e02356-21. https://doi.org/10.1128/aem.02356-21

Harper, S. J., Ward, L. I., & Clover, G. R. G. (2010). Development of LAMP and Real-Time PCR Methods for the Rapid Detection of Xylella fastidiosa for Quarantine and Field Applications. *Phytopathology*®, *100*(12), 1282–1288. https://doi.org/10.1094/PHYTO-06-10-0168

Hornero, A., Hernández-Clemente, R., Beck, P. S. A., Navas-Cortés, J. A., & Zarco-Tejada, P. J. (2018). Using Sentinel-2 Imagery to Track Changes Produced by Xylella Fastidiosa in Olive Trees. *IGARSS 2018 - 2018 IEEE International Geoscience and Remote Sensing Symposium*, 9060–9062. https://doi.org/10.1109/IGARSS.2018.8517697

Hill, B.L. & Purcell, A.H. (1995). Acquisition and retention of *Xylella fastidiosa* by an efficient vector, *Graphocephala atropunctata*. *Phytopathology*. *85*(2), 209-212.

Krugner, R., Sisterson, M. S., Chen, J., Stenger, D. C., & Johnson, M. W. (2014). Evaluation of Olive as a Host of Xylella fastidiosa and Associated Sharpshooter Vectors. *Plant Disease*, *98*(9), 1186–1193. https://doi.org/10.1094/PDIS-01-14-0014-RE

Landa, B. B., Velasco-Amo, M. P., Marco-Noales, E., Olmo, D., López, M. M., Navarro, I., Monterde, A., Barbé, S., Montes-Borrego, M., Román-Écija, M., Saponari, M., & Giampetruzzi, A. (2018). Draft Genome Sequence of Xylella fastidiosa subsp. Fastidiosa Strain IVIA5235, Isolated from Prunus avium in Mallorca Island, Spain. *Microbiology Resource Announcements*, *7*(14), 10.1128/mra.01222-18. https://doi.org/10.1128/mra.01222-18

Loconsole, G., Saponari, M., Boscia, D., D'Attoma, G., Morelli, M., Martelli, G. P., & Almeida, R. P. P. (2016). Intercepted isolates of Xylella fastidiosa in Europe reveal novel genetic diversity. *European Journal of Plant Pathology*, *146*(1), 85–94. https://doi.org/10.1007/s10658-016-0894-x

Maggiore, G., Semeraro, T., Aretano, R., De Bellis, L. & Luvisi, A.(2019). GIS Analysis of Land-Use Change in Threatened Landscapes by Xylella fastidiosa. *Sustainability*, *11*(1), 253. https://doi.org/10.3390/su11010253

Nunney, L., Azad, H., & Stouthamer, R. (2019). An Experimental Test of the Host-Plant Range of Nonrecombinant Strains of North American Xylella fastidiosa subsp. Multiplex. *Phytopathology*®, *109*(2), 294–300. https://doi.org/10.1094/PHYTO-07-18-0252-FI

O'Leary, M. L., Burbank, L. P., Krugner, R., & Stenger, D. C. (2020). Complete Genome Sequence Data of Three Xylella fastidiosa subsp. Multiplex Strains Isolated from Olive Trees in California, U.S.A. *Phytopathology*®, *110*(11), 1759–1762. https://doi.org/10.1094/PHYTO-05-20-0167-A

Parris, S. M., Jeffers, S. N., Olvey, J. M., Olvey, J. M., Adelberg, J. W., Wen, L., ... & Saski, C. A. (2022). An in vitro co-culture system for rapid differential response to Fusarium oxysporum f. sp. vasinfectum race 4 in three cotton cultivars. *Plant Disease*, *106*(3), 990-995.

Purcell, A. H., Saunders, S. R., Hendson, M., Grebus, M. E., & Henry, M. J. (1999). Causal Role of Xylella fastidiosa in Oleander Leaf Scorch Disease. *Phytopathology*, *89*(1), 53–58. https://doi.org/10.1094/PHYTO.1999.89.1.53

Sicard, A., Saponari, M., Vanhove, M., Castillo, A. I., Giampetruzzi, A., Loconsole, G., Saldarelli, P., Boscia, D., Neema, C., & Almeida, R. P. P. (2021). Introduction and adaptation of an emerging pathogen to olive trees in Italy. *Microbial Genomics*, *7*(12), 000735. https://doi.org/10.1099/mgen.0.000735

Tanno, K., Maejima, K., Miyazaki, A., Koinuma, H., Iwabuchi, N., Kitazawa, Y., ... & Namba, S. (2018). Comprehensive screening of antimicrobials to control phytoplasma diseases using an in vitro plant–phytoplasma co-culture system. *Microbiology*, *164*(8), 1048-1058.

Tolocka, P.A. , Guzmán, F.A. , Paccioretti, M.D. , Roca, M.E. , Otero, M.L. & Haelterman, R.M. (2021) Identificación de la secuencia tipo ST78 de *Xylella fastidosa* en olivo de Argentina [poster]. *5 th Congreso Argentino de Fitopatologia*. Available at: https://repositorio.inta.gob.ar/xmlui/handle/20.500.12123/10519 [Accessed 28th February 2023].

Vanhove, M., Sicard, A., Ezennia, J., Leviten, N., & Almeida, R. P. P. (2020). Population structure and adaptation of a bacterial pathogen in California grapevines. *Environmental Microbiology*, *22*(7), 2625–2638. https://doi.org/10.1111/1462-2920.14965

Viseur, J., & Figueroa, T. M. (1986, June). In vitro co-culture as a tool for the evaluation of fire blight resistance in pears and apples. In *IV International Workshop on Fire Blight 217* (pp. 273-282).

Harris, Jordan L., Patrick L. Di Bello, Monica Lear, and Yilmaz Balci. "Bacterial Leaf Scorch in the District of Columbia: Distribution, Host Range, and Presence of *Xylella Fastidiosa* Among Urban Trees." *Plant Disease* 98, no. 12 (December 2014): 1611–18. https://doi.org/10.1094/PDIS-02-14-0158-SR.

Olmo, Diego, this link will open in a new tab Link to external site, Alicia Nieto, David Borràs, Marina Montesinos, Francesc Adrover, Aura Pascual, et al. "Landscape Epidemiology of Xylella Fastidiosa in the Balearic Islands." *Agronomy* 11, no. 3 (2021): 473. https://doi.org/10.3390/agronomy11030473.

Love, Natalie L.R., Viet Nguyen, Camille Pawlak, Andrew Pineda, Jeff L. Reimer, Jennifer M. Yost, G. Andrew Fricker, et al. "Diversity and Structure in California's Urban Forest: What over Six Million Data Points Tell Us about One of the World's Largest Urban Forests." *Urban Forestry & Urban Greening* 74 (August 2022): 127679. https://doi.org/10.1016/j.ufug.2022.127679.

Santoiemma, Giacomo, Giovanni Tamburini, Francesco Sanna, Nicola Mori, and Lorenzo Marini. “Landscape Composition Predicts the Distribution of Philaenus Spumarius, Vector of Xylella Fastidiosa, in Olive Groves.” *Journal of Pest Science* 92, no. 3 (June 2019): 1101–9. https://doi.org/10.1007/s10340-019-01095-8.

Zaini, P. A., Lee, S. H., Leslie, C. A., Walawage, S. L., Jiang, C. Z., Browne, G. T., ... & Kasuga, T. (2021). A rapid in vitro phenotypic assay of walnut shoots for prescreening resistance to Phytophthora pini. Plant Health Progress, 22(3), 235-239.

CALIFORNIA OLIVE COMMITTEE

RESEARCH PROPOSAL

Project Year: 2025 **Project Period:** Year 3 of our 2023-2025 project

Project Title: Integrating Alternate Bearing Mitigation Strategies in a Commercial Table Olive Orchard

Project Investigators: Elizabeth Fichtner and Carol Lovatt

EF-Farm Advisor, Orchard Systems, Cooperative Extension, 4437 S. Laspina St., Tulare, CA 93274; Phone: 559-684-3310; Fax: 559-685-3319; Email: ejfichtner@ucanr.edu

CL-Professor of Plant Physiology, Emeritus & Professor in the Graduate Division, Botany and Plant Sciences-072, UC Riverside, CA 92521-0124; Phone: 951-660-6730; Fax: 951-827-4437; Email: carol.lovatt@ucr.edu

Collaborator:
Kent Daane, Professor and Cooperative Extension Specialist, Department of Environmental Science, Policy, and Management, UC-Berkeley, CA, and Kearney Research and Education Center (REC), 9240 S. Riverbend Ave., Parlier, CA 93648: Phone: 559-646-6522; Fax: 559-646-6593; E-mail: kdaane@ucanr.edu

KD-has offered to continue sharing his expertise and advice during year 2 of our research (1) to quantify black scale populations at important stages in their life cycle, honeydew produced by black scale, and sooty molds that grow on the honeydew, (2) to rate the impact on fruit quality, and (3) to assist the PIs in statistically analyzing the data interpreting the results.

Cooperators:
Ismael Gutierrez, I.G. Harvesting, 113 E. Hickory St., Lindsay, CA 93247; Phone: 559-805-8181; E-mail: Gutierrezismael559@gmail.com

Donald Cleek, Agricultural Supervisor, UC Lindcove REC, 22963 Carson Avenue, Exeter, CA 93221; Phone: 559-592-2408, Ext 1157; Email: dlcleek@ucanr.edu

IG will provide the new olive orchard, with black scale present, for the research project.

DC will apply the foliar treatments (approval for DC to spray off the Lindcove REC and on the cooperators property has been secured).

Year Initiated: 2023 Anticipated Duration of Project**:** 3 crop years 2025 request: **$34,984**

Objectives of Proposed Research:

The research proposed has four objectives and goals:

(1) to test the results of our prior COC-funded research in a second commercial 'Manzanillo' table olive orchard to confirm that (*i*.) foliar-applied NAA at full bloom (FB) or (*ii*.) pruning (hedging and topping) 28 days after full bloom (DAFB) to one side of the tree and then the other side of the tree every other year (*biennially*) are the best crop reduction strategies for reducing the severity of alternate bearing for total yield and yield of medium + larges (M+L) size fruit (based on alternate bearing index, ABI) and increasing yields of M+L size fruit compared to each of the following treatments: (*iii*.) ON-/OFF alternate bearing (untreated) control trees; (*iv.*) Foliar applied NAA @ FB to one side of the tree then the other side of the tree the following year – *annually* (Treatment 4 will be deleted, see justification later in the proposal); (*v*., *vi.*, *vii.*, and *viii*.) trees treated with urea at FB or 10 DAFB on one side of the tree and then the other side *annually* or *biennially;* (*ix*, *x*., *and xi*.) trees treated with 200 ppm, 400 ppm, or 800 ppm Accede at FB; or (*xii*) trees pruned on two sides of the tree in winter *annually* (grower standard practice). Note: all pruning treatments include topping at the time of pruning. In addition, in a second orchard, our on-going research compares the efficacy of our strategy of pruning (hedging and topping) 28 DAFB to one side of the tree and then the other side every other year (*biennially*) with this pruning applied to two sides of the trees in every other row every other year. The goal is to determine the management strategy that mitigates alternate bearing (AB) and maximizes yield of commercially valuable size fruit;

(2) to use the sum of the bloom estimates on two sides of an olive tree to decide when to use a crop reduction strategy in a 'Manzanillo' olive orchard to maintain high yields of commercially valuable size M+L fruit and thereby, test how well the relationships among estimated bloom, total yield and yield of M+L size fruit from our previous COC-funded research hold up in a second orchard and to make needed adjustments. The goal is to develop a decision support tool that growers will find easy, rapid and valuable to use annually across multiple acres of table olive trees to determine whether a crop reduction strategy is required to maintain yields of M+L size fruit;

(3) to quantify the effects of crop reduction strategies, which range from pruning both sides of the tree annually, pruning one side every other year, to no pruning (alternate bearing control) on the resurgence of black scale populations, honeydew, associated sooty mold, and fruit quality in a table olive orchard. The goal is to determine, to the degree climatic conditions during the 3-year experiment permit, whether the integration of specific alternate bearing mitigation strategies in a commercial table olive orchard has the potential to positively or negatively affect black scale pest management, e.g., pesticide use, and table olive fruit quality.

Justification and Importance of the Proposed research:

Alternate bearing (AB), production of a heavy, high yield "on crop" followed by a light, low yield "off crop", is a significant economic problem. In ON-crop years, trees produce numerous small size fruit with reduced commercial value. In OFF-crop years, trees produce large fruit, in some cases too large, but there are too few fruit to provide growers with a good income. In addition, our earlier research documented that fruit quality is also reduced in OFF-crop years. The large fruit of

OFF-crop trees turn black earlier in the season in some years, which can further exacerbate the problem of too few commercially valuable fruit. For olive, the ON-crop takes longer to mature, attain size, and accumulate oil. The delayed harvest further reduces floral intensity the following spring. Alternate bearing often occurs beyond the tree or orchard level, synchronizing across geographic regions, particularly when initiated by environmental conditions that reduce crop load (e. g., heat at bloom in 'Manzanillo' orchards). An industry-wide shortage of fruit in the OFF-crop year has a negative economic impact on every step in the production chain from farm to consumer, including orchard management, harvesting, packinghouse and processor operations, manufacture of value-added products, marketing, and consumer prices. Taken together, the negative effects of AB jeopardize the stability and sustainability of the table olive industry.

Climate is the major factor initiating AB. Adverse climate events, such as high or low temperatures, water-deficit stress or excessive winter rain causing soil hypoxia etc., that significantly reduce yield result in an OFF crop that is followed by an ON crop. Conversely, optimal climate conditions during flowering and fruit set, such that natural fruit thinning fails to occur result in an ON crop that is followed by an OFF crop. Climate events repeat in a random manner, creating a reoccurring need for a strategy to mitigate AB and the negative economic impact of AB on table olive growers and the industry.

Results of our prior COC-funded research confirmed the results first reported by Sibbett (2000) that the young developing fruit of the ON crop of 'Manzanillo' olive trees inhibit summer vegetative shoot growth and thereby reduce the number of nodes that bear floral (inflorescence) buds the following spring (Fichtner and Lovatt, 2018). The developing ON crop also inhibits the transcription of key genes required for inflorescence development and flower formation (Chao, 2014; Fichtner et al., 2021). The maturing fruit of the ON-crop significantly increase abscission of floral buds for next year's bloom starting in September, explaining reports that later harvests further reduce return bloom (Chao, 2014; Fichtner and Lovatt, 2018; Fitchner et al., 2021). For ON-crop olive trees, the negative effects of fruit set on a shoot (localized effect) are stronger than the effects of the total number of fruit (crop load) on the tree (whole tree effect) (Fitchner et al., 2021). Thus, it is the nonbearing shoots on ON-crop trees, which are in the minority, that produce the inflorescences at spring bloom following the ON-crop year (Fichtner and Lovatt, 2018). Further, a cytokinin-based strategy was only effective in stimulating summer vegetative shoot growth and increasing return bloom on nonbearing shoots of ON-crop trees (Fichtner and Lovatt 2018; Fichtner et al., 2021). Thus, a crop reduction strategy that increases the number of nonbearing shoots is necessary to mitigate the negative effects of the ON-crop in an AB olive orchard. Results of our COC-funded research identified two effective crop reduction strategies. Foliar-applied NAA at FB and pruning (hedging and topping) 28 DAFB to one side of the tree and then the other side of the tree every other year, *biennially, not annually,* evened out total annual yield, but more importantly increased the annual yield of M+L size fruit, with yields near equal in the years after the year treatment was initiated (Fitchner and Lovatt, 2023). The results documented the need for a rest period of approximately one year between treating the second side of an olive tree with NAA at FB or pruning 28 DAFB (Fichtner and Lovatt, 2023; 2024). However, it is important to note that these results were obtained in a single field experiment. Additionally, the success of these two treatments was due in part to not carrying out the scheduled crop reduction

strategy in the final year of the project due the low number of inflorescences at bloom based on the sum of the estimated bloom on the east and west sides of the trees in north-south running rows. Thus, it is not only important to know when to carry out crop reduction, but also to know when crop reduction should not be done in order to maintain high yields of M+L size fruit. Before this information is recommended for implementation by table olive growers, the results need to be validated in a second experiment conducted in a new commercial table olive orchard.

Crop reduction strategies reduce yield and are thus, economically viable in high yield ON-crop years only because they increase the yield of commercially valuable size fruit. Foliar application of NAA or pruning to low bloom/low yield trees can reduce yield of M+L size fruit below the profit margin. Pruning is critical to tree crop production to open the canopy for light penetration (no light, no flowers, not fruit), to increase canopy complexity, to create new fruiting shoots, and to balance the proportion of bearing vs. nonbearing shoots to maintain yield and fruit size on an annual basis, in addition to keeping rows open for orchard management, e.g., harvest, pesticide application. Pruning both sides of the tree in winter has the disadvantage that nonbearing and bearing shoots from the previous year, which have a high and low potential to flower the following spring, respectively, are not as easy to distinguish. Given the random reoccurrence of climate conditions that result in OFF or ON blooms, decisions about when, how many sides of the tree, and how frequently to use a crop reduction strategy in an orchard are critical and are best made based on a visual inspection of bloom, with knowledge of the potential impact that each decision has on the yield of M+L size fruit, not just in the ON year but in subsequent years also. Additionally, it is important to know whether the strategy selected to mitigate AB will impact table olive orchard pest management. Choices for crop reduction starting in an ON-crop year include pruning both sides of the tree *annually*, one side of the tree every other year (*biennially*) or eliminating pruning in favor of using foliar-applied NAA, urea or Accede. Thus, the crop reduction strategy selected to mitigate alternate bearing regulates the degree to which the canopy is open or closed at different times of the year and would thereby affect black scale survival, associated honeydew production and sooty mold growth, fruit quality and pesticide use.

Kent Daane, our collaborator, explained the following to us. Black scale population densities and damage has long been associated with temperatures in the olive canopy. More open canopies and more frequent pruning result in higher temperatures and drier conditions – both of which result in greater scale mortality. This relationship is also clearly associated with summer temperatures, but traditional pruning strategies are timed to post-harvest winter periods, when the scale population has already established and reached the second to third instar stages. Proposed herein are pruning strategies timed closer to June when the scale first instars have hatched and are most vulnerable to hot, dry conditions. Increasing black scale mortality at this critical period could logically reduce damage resulting from associated honeydew production and growth of sooty mold and reduce insecticide use targeting black scale.

Our on-going research project is perfect for addressing the new COC priority "Investigation of urea as a thinning agent. What is the cost and optimal application rate? Where is it currently being used?". It is also prefect for fulfilling the COC's request to test the efficacy of Accede as an olive fruit thinning agent. Our research includes all the appropriate comparisons to determine the efficacy of foliar-

applied urea and Accede to increase the yield of CVS M+L fruit and mitigate AB and to calculate the cost to benefit of successful strategies using pruning, NAA, urea or Accede. Furthermore, due to the low fruit set at our Woodlake site in 2023 and 2024, we decided in the summer of 2024 to select a new orchard and save part of our 2024 COC funds to fund part of our 2025 research. With the selection of a new research orchard, the added urea and Accede treatments will be correctly integrated and replicated when we lay out the new experiment and partially paid for with our 2024 funds.

The published literature reports that the use of urea at 2%, 4%, 6%, 8% and 10% at various times, including FB, and 5, 10, 15 and 20 DAFB, was effective for olive fruit thinning (crop reduction) of 'Manzanillo' olive and/or other table olive cultivars (Barratta et al., 1990; Hegazi et al., 2017; Osman, 2013). In two of three studies, urea was compared to 100 ppm and 150 ppm NAA (Hegazi et al., 2017; Osman, 2013). In both cases, the authors concluded that 4% urea applied 10 DAFB was an effective fruit thinning agent for 'Manzanillo' olive, but 150 ppm NAA was more effective for increasing fruit size (g/fruit). [In our research, we have consistently used 165 ppm NAA (label rate for flower removal).] In the 2-year study of NAA and urea on 'Manzanillo' olive, the various urea concentrations produced different results in years 1 and 2, but NAA was more effective than urea in both years for increasing fruit size (g/fruit) (Hegazi et al., 2017). For 'Dolce' table olive, 2% and 4% urea increased fruit size to medium, whereas 100 ppm and 150 ppm NAA increased fruit size to large; total yield was significantly greater in year 1 with 150 ppm NAA but in year 2, total yields for 150 ppm NAA and 4% urea were equal (Osman, 2013). Urea (4%) and NAA (150 ppm) equally increased percent oil content of fruit on both a fresh and dry weight basis (Osman, 2013). Urea (6%) applied 20 DAFB increased fruit size (g/fruit) but resulted in low yields and phytotoxic damage to 'Nocellara del Bolice' olive (Barratta, 1990). Treatment effects on AB and fruit size as kg/tree were not reported in these publications. The published literature provides evidence that NAA is commercially used as a fruit thinning agent to increase olive fruit size throughout the global olive industry; no similar reports were found for urea. Based on the published results, a concentration of 4% urea was chosen for the research with application times at FB and 10 DAFB to one side of the tree and then the other *annually* and *biennially*. Urea will be applied to only one side of an olive tree, rather than the whole tree, because, like NAA, urea could result in over-thinning and leaf drop due to ammonia toxicity in response to high temperature. The cost of low-biuret urea ($40/50 lbs) applied at 4% in 100 gallons of water/acre is only $26.70/acre compared to $102.14 for NAA (Liqui-Stik $326.853/gallon) applied at the label rate (165 ppm) in 100 gallons of water/acre (Source for the commercial cost of products: Nutrien Ag Solutions, San Jacinto, CA). Investigation of urea as a fruit thinning agent to increase fruit size and mitigate AB is warranted based on the published results and lower cost of urea relative to NAA.

We found no published research articles on the use of AccedeSG® (Valent USA) as an olive fruit thinning agent to increase fruit size. The active ingredient in Accede is 1-aminocyclopropane-1-carboxylic acid (ACC), the immediate precursor of ethylene biosynthesis. The tree's enzyme ACC oxidase converts ACC to ethylene. ACC oxidase activity is not significantly accelerated by high temperature, reducing the potential for over-thinning in a heat wave. Accede is registered for use as a thinning agent to increase fruit size for apple and stone fruit, including nectarines and peaches rates (at 300-600 ppm/100 gallons/acre) and apricots, cherries and plums (at 100-600 ppm/100

gallons/acre). There is published literature to support the efficacy of Accede to increase fruit size through fruit thinning of these crops. For stone fruit, the application time is early to late bloom with a second spray 3 to 10 days later, if required. In 2016, at the request of Rob Fritts, Valent USA, we tested Accede applied to 'Manzanillo' olive trees at the requested rates of 500 ppm and 1000 ppm @ FB to one side of the tree and achieved a promising 36% and 31% fruit reduction, respectively, but the number of trees tested was too small to reveal a significant effect on total yield or fruit size (g/fruit). Valent's interest moved to use of Accede for pre-harvest olive fruit loosening with Drs. Louise Ferguson, Georgia Drakakaki and Becky Wheeler-Dykes. Based on the research experience of Joszef Rascko, Valent USA, and to keep the cost of using Accede commercially viable, we propose to test the efficacy of three concentrations of Accede, 200 ppm, 400 ppm and 800 ppm (in 100 gallons/acre) @ FB to one side of the tree and then the other side *biennially*. The Accede label specifies not to exceed 600 ppm in a single application. However, if a higher rate is required to effectively thin olive fruit to increase the yield of CVS M+L fruit, we will test higher concentrations in subsequent years. Valent USA was opposed to using a second application 3-10 DAFB. The cost of AccedeSG (soluble granules) ($564.60/20 oz. per Nutrien Ag Solutions, Tulare, CA) is $182.20, $364.40 and $728.80/100 gallons/acre at 200 ppm, 400 or 800 ppm/100 gallons/acre as a single application at FB. Thus, the cost of using AccedeSG as a fruit thinning agent is greater than using NAA. The goal is to increase fruit size by maximizing yield of CVS fruit as kg and number per tree to increase grower income and maintain this benefit across years by mitigating AB. Note: Olive will need to be added the Accede label might, but this might only require efficacy data as the material is already registered as a fruit thinning agent for stone fruit (J. Rascko, personal communication). If Accede has to be registered as a fruit thinning agent for use on olive, the cost of registering Accede for this use might be reduced considerably if Valent USA registers Accede as an olive pre-harvest fruit loosening agent. For example, an MRL might not be required for the earlier application(s) and possibly lower concentrations of Accede used for fruit thinning.

Our logic for testing the efficacy of biennial applications of NAA and Accede, and not annual applications, is that a PGR fruit thinning agent (e.g., NAA or Accede) to increase fruit size would be used in an ON-crop year but not the following OFF-crop year, when we need all the fruit set on the tree to have sufficient yield of M+L size fruit for a good grower income. Further, there is no need for the strength of a PGR fruit thinning agent in a moderate yield year when fruit size is good and the number of M+L size fruit is also good. Thus, we deleted treatment 4, Foliar applied NAA @ FB to one side of the tree then the other side of the tree the following year – *annually* to reduce the cost of adding Accede to the project. Urea, on the other hand, might be beneficial for increasing fruit size in the year following the ON crop by increasing N availability. Treating one side of the tree only is justified because this approach reduces the risk of over thinning. In our approach, we want all the flowers or fruit to be removed on the treated side of the tree. Treating only one side of the tree and only biennially reduces the overall cost of managing an orchard to mitigate AB and maximizing yields of M+L size fruit annually.

Procedures to Accomplish Objectives:

To meet objective 1, we will conduct a field experiment in a commercial 'Manzanillo' olive orchard going into an ON bloom/ON-crop year. The experiment will be a randomized complete

block design with 14 individual tree replications per treatment and 12 treatments that specifically meet the three objectives of the proposed research. The treatments include:

1) Untreated ON-crop control (last pruned and topped in winter 2023), e.g., alternate bearing control
2) Pruning (hedging and topping) @ 28 DAFB to one side of the tree then the other side of the tree every other year - *biennially*
3) Foliar-applied NAA @ FB to one side of the tree then the other side of the tree every other year - *biennially*
4) ~~Foliar-applied NAA @ FB to one side of the tree then the other side of the tree the following year – *annually*~~* *(Treatment 4 will be deleted)
5) Foliar-applied urea @ FB to one side of the tree then the other side of the tree the following year - *annually*
6) Foliar-applied urea @ FB to one side of the tree then the other side of the tree every other year - *biennially*
7) Foliar-applied urea @ 10 DAFB to one side of the tree then the other side of the tree the following year - *annually*
8) Foliar-applied urea @ 10 DAFB to one side of the tree then the other side of the tree every other year - *biennially*
9) Foliar-applied Accede (200 ppm) @ FB to one side of the tree then the other side of the tree every other year - *biennially*
10) Foliar-applied Accede (400 ppm) @ FB to one side of the tree then the other side of the tree every other year – *biennially*
11) Foliar-applied Accede (800 ppm) @ FB to one side of the tree then the other side of the tree every other year - *biennially*
12) Pruning (hedging and topping) @ 28 days after full bloom to one side of the tree then the other side on a flexible schedule, using a decision support tool based on estimated sum of the bloom on the two opposing sides of the tree – *flexible schedule*
13) Control – grower standard practice of pruning two sides of the tree and topping in winter - *annually*.

The NAA, urea and Accede treatments will be applied by our cooperator D. Cleek in the equivalent of 100 gallons of water/acre as described above. Liqui-Stik Concentrate® NAA (Loveland Products) will be applied according to the label directions (165 ppm for flower removal), which is identical to and has the exact same label and application rate as AMVAC's Olive Stop®, which we used in our previous research. Low-biuret urea (46% N, 0.25% biuret) will be applied at 4%/100 gallons/acre. Additionally, we will treat a subset of trees with 6% and 8% low-biuret urea at 10 DAFB to determine if these concentrations of urea cause phytotoxicity and/or da mage the young developing fruit. If the results in year 1 demonstrate that 4% low-biuret urea does not cause thinning sufficient to increase the yield of CVS M+L fruit (kg/tree) relative to NAA or pruning and 6% (or 8%) low-biuret urea are demonstrated to be nonphytotoxic, in subsequent years we will increase the urea concentration to 6% (or 8% if required). Accede will be applied at 200 ppm, 400 ppm, and 800 ppm in 100 gallons/acre, which are the near the low end and above the high ends of the label rates for stone fruit. If 800 ppm Accede at FB does result in sufficient thinning to

increase the yield of CVS M+L fruit (kg/tree) relative to NAA or pruning, we will increase the concentration applied at FB in subsequent years. Joszef Rasko advised us that Valent prefers not to apply a second application of Accede 10 DAFB. Accede is not phytotoxic at concentrations as high as 1500 ppm/100 gallons/acre. Trees will be pruned as scheduled and harvested in October of each year by our cooperator I.G. Harvesting.

To meet Objective 1 and to address grower questions, in year 1 we added two additional treatments in a 'Manzanillo' olive orchard in Exeter (Lindcove REC) to compare the efficacy of pruning one side of the tree 28 DAFB and then the other side *biennially* to pruning both sides of the trees in every other row every other year, e. g., both sides of trees in rows 1 and 3 pruned in years 1 and 3, with both sides of trees in rows 2 and 4 pruned in years 2 and 4. There were not enough trees to include this comparison at our Woodlake site. This research is on schedule. Moreover, this orchard was added to serve as a control for testing our estimated bloom model. We know our bloom model works with Lindcove REC orchard. If it doesn't work at Woodlake and continues to work at Lindcove, then we learn that modification is required to expand its use across orchards. If the model doesn't work at either site in one year, then we learn that the model's efficacy is influenced by post-bloom climate.

In all cases, total yield and fruit size distribution (kg/tree) will be determined and used to calculate yield and fruit size distribution as number of fruit per tree. Starting with harvest in Year 2, alternate bearing index (ABI) will be calculated for total yield and yield of M+L size fruit. ABI = (year 1 yield – year 2 yield)/ (year 1 yield + year 2 yield), in which yield is in kilograms of fruit per tree and the difference in yield between years 1 and 2 is expressed as an absolute number. An ABI of zero means no alternate bearing, whereas an ABI of one is complete alternate bearing, i.e., crop one year, no crop the other year (Pearce and Dobersek-Urbanc, 1967). Analysis of variance (ANOVA) will be used to test for treatment effects on bloom estimates, total yield, yield of M+L size fruit, fruit quality parameters, and ABI using the General Linear Model procedure of SAS (version 9.3; SAS Institute, Cary, NC). When ANOVA testing indicates significant differences, post-hoc comparisons will be run utilizing Fisher's protected least significant difference (LSD) test. Pearson's product moment correlation coefficients will be calculated to identify significant relationships ($r > 0.5$, $P \leq 0.05$). Significant correlations will be subjected to regression analyses, using the least squares method for the generalized linear model. The experiment is designed to determine the management strategy that maximizes yield of commercially valuable size fruit both during and after mitigation of alternate bearing, the goal of objective 1.

To meet objective 2, we will estimate the bloom on two opposing sides of the tree on a scale from 0, no bloom, to 3, heavy bloom, and calculate the sum of the bloom. The estimated sum of the bloom, based on the relationships with total yield and yield of M+L size fruit observed in our previous COC-funded research, will be used to determine when and when not to prune the trees in treatment 12. We are currently testing a threshold value of 4.5 ± 0.25. Trees with an estimated bloom sum above this value would require crop reduction, trees with an estimated sum of the bloom below this value would not be treated. Data collected annually will be used to analyze the relationships among bloom estimates, total yield and yield of M+L size fruit by calculating Pearson's product moment correlation coefficients to identify significant relationships ($r > 0.5$, P

≤ 0.05) to determine how well the new data fit our earlier results. Significant correlations will be subjected to regression analyses, using the least squares method for the generalized linear model, and more sophisticated analyses as warranted. Prior results suggest that the variability in the relationship between the range in total yields that result in high yields of M+L size fruit is narrow. If the yield data from this second experiment prove this to be the case, the sum of bloom estimates on two opposing sides of the tree should be able predict when and when not to impose a crop reduction strategy to better maintain yields of M+L size fruit from one year to the next across orchards of similar size trees pruned similarly; a new relationship will likely need to be established for trees in high-density plantings. In addition, the model will indicate poor crop years when the yield of commercially valuable size fruit is best maintained by eliminating the application of a crop reduction treatment.

The second part of objective 2 is to work with our grower cooperator and the COC to determine how to collect the data and implement the results in a manner acceptable to a grower with extensive commercial olive acreage to meet the goal of objective 2, which is to develop a decision support tool that growers will find easy, rapid and valuable to use annually across multiple acres of table olive trees to maintain yields of M+L size fruit.

To meet objective 3, in addition to selecting a new orchard going into an ON-crop year, we will select an orchard with a history of black scale, which has not been treated in recent years, and with visual proof of black scale presence. Black scale population numbers were monitored in Years 1 and 2 and will be monitored in the spring and fall of each year in the new orchard. The presence of honeydew droplets on olive leaves in March and April, which correspond to a rapid increase in scale size, is often the earliest signal of increased scale density in the orchard. In April, the terminal ends [20 inches long (about 50 cm)] of four branches will be monitored on eight trees (replications) per treatment and honeydew and sooty mold accumulation will be rated on a 0-3 scale (0 = no honeydew, 1 = presence of honeydew, 2 = honeydew and sooty mold on < 30% of the branch, and 3 = honeydew and sooty mold on > 30% of the branch. In April and October, the scale density will be evaluated by counting the number of mature scales (third instar to adult) on the terminal ends of the four branches on eight trees (replications) per treatment. For categorical ratings of scale number, and honeydew and sooty mold accumulation, treatment effects will be compared in a 2 by 2 contingency table with treatments separated using Pearson's Chi-square test. Scale densities will be compared using the General Linear Model function, with treatments separated using Tukey or Dunnett Pairwise comparison. We also calculated the net change in honeydew and sooty mold ratings and black scale numbers from April to October and year to year and will do this in the new research orchard.

The treatments in our experiment provide a range in canopy openness and closure and pruning times, which combined with our detailed analyses of black scale at two periods in the life cycle, plus honeydew and sooty mold accumulation will enable us to determine whether the integration of specific AB mitigation strategies in a commercial table olive orchard have the potential to positively or negatively affect black scale pest management, e.g., pesticide use, and table olive fruit quality (goal 3).

An analysis of the cost of each treatment versus the increase in yield of CVS M+L fruit, with and without savings in black scale management, will be completed at the end of the research project.

Timetable for Project:

The research proposed addresses the economic problem of alternate bearing. The goal is to document that the putative best crop reduction strategies are ones applied every other year. The orchard we selected in Woodlake, despite having an ON bloom in 2023 and 2024, produced low yields in 2023 and 2024. Observing the poor set in summer of 2024, we decided to obtain a new 'Manzanillo' olive orchard to complete our research, rather than risk a third year with limited results. Thus, we did not spend all of the 2024 budget allocated to UCR, which has enabled us to reduce UCR's year 3 (2025) budget. Due to the cost of establishing the research, which now includes four treatments to test the efficacy of urea and three treatments to test the efficacy of Accede, in the new orchard, the ANR budget has increased. Two additional years of funding will be required to complete the research in the new orchard to address both the new COC priority using foliar-applied urea and the COC's request to test Accede as a fruit-thinning agents to increase fruit size and mitigate AB. We added three treatments to test the efficacy of Accede and deleted treated treatment 4 as explained above. Our original 2025 proposal budgeted for 140 trees. The project has expanded 20% to 168 trees. Due to person-hours required to lay out the current experiment and tag the shoots to quantify honey dew, sooty mold and black sale, thus, the current budget for 2025 has increased approximately 20% over our earlier submission. Subsequent budgets for 2026 and 2027, should be approximately $32,000 to $36,000 per year, depending on ANR salary increases and cost increases for pruning and harvest by I.G. Harvesting and spraying by the Lindcove REC. No problem was encountered with the research being conducted at the Lindcove REC, which compares pruning one side of the tree and then the other side *biennially* with pruning both sides of the trees in every other row every other year. This research is anticipated to be completed in June 2026 with a no cost extension through June 2026, contributing to budget reductions in 2026 and 2027. All treatments will be applied in 2025 in the new orchard going into an ON bloom (with a known black scale problem) beginning in February with the winter pruning treatment (control – standard grower practice). NAA will be applied at FB, low-biuret urea will be applied at FB and 10 DAFB. Accede will be applied at FB. Pruning treatments will be applied 28 DAFB. The pruning treatments at Lindcove will also be applied 28 DAFB. If the results in year 1 demonstrate that 4% low-biuret urea or 800 ppm Accede do not cause thinning sufficient to increase the yield of M+L size fruit (kg/tree) relative to NAA or pruning and 6% (or 8%) low-biuret urea are not phytotoxic, then in year 2 we will increase the urea concentration to 6% (or 8% if required) and Accede to 1,000 ppm or 1,200 ppm for the remaining 2 years of the research. The treatment application times will remain the same for each year that they are applied. Bloom estimates will be completed each year just prior to full bloom, statistically analyzed, and then used to evaluate whether a treatment should be applied or not, but the decision will be implemented only in treatment 12. Harvests will be in October each year with fruit samples collected one to two days before harvest for the analysis of fruit size and quality. All yield data will be statistically analyzed to determine the significance of treatment effects on all yield parameters (as described

above). After harvest each year, the relationships among the sum of the bloom estimate, total yield and yield of M+L size fruit will be analyzed (as described above). A decision support tool will be evaluated across commercial table olive acreage for speed and accuracy, using the current or refined model, based on data obtained from the new orchard compared with current and prior results obtained at Lindcove. Each year in April and October, the presence of honeydew droplets and sooty mold, and the number of mature scales (third instar to adult) will be quantified on four branches on eight trees (replications) per treatment. All results, with the possible exception of the yield and fruit quality data and final black scale data which are collected in October, will be presented in the Interim Progress Report in October. final black scale results, yield and fruit quality data, and statistical analysis of the relationships among sum of the bloom estimates, total yield and yield of M+L size fruit will be included in the final report in June the following year (with approval of a no cost extension).

Present Outlook and Estimated Success in Accomplishing the Objectives:
Objective 1. The present outlook is that we will secure a new orchard going into an ON-bloom year that will produce an ON crop and has a history and visual presence of black scale to successfully complete objective 1 (and objective 3), which includes the COC's new priority, "Investigation of urea as a thinning agent. What is the cost and optimal application rate? Where is it currently being used?" and the COC's request to test Accede as a fruit thinning agent to increase fruit size (as kg M+L size fruit/tree).

Research at Lindcove, which compares pruning one side of the tree and then the other side *biennially* with pruning both sides of the trees in every other row every other year is on schedule. At Lindcove, the 2023 ON-bloom (sum of the 2 sides of the trees > 5.1-6.1) resulted in an OFF-crop and the sum of the bloom was not correlated with total yield or yield of M+L size fruit; whereas in 2024, the sum of the bloom, which was less than 4.5 ± 0.25, resulted in a greater crop than in 2023, and was significantly correlated with both total yield ($r = 0.72$, $P = < 0.0001$) and yield of M+L size fruit ($r = 0.58$, $P = < 0.0001$), consistent with a post-bloom climate event in 2023. Total yield was predictive of the yield of M+L size fruit in both years (2023 $r = 0.74$, $P = < 0.0001$; 2024 $r = 0.73$, $P = < 0.0001$). There was a slight trend towards greater annual and 2-year cumulative total yields and yields of M+L size fruit for trees pruned on one side and then the other *biennially* compared to pruning both sides of the trees in every other row every other year. However, at the end of 2 years, the yield differences were not statistically significant (Table 1). Over the 2 years of the experiment, there were no treatment effects on the severity of alternate bearing based on ABI. At harvest in 2024, there were no significant effects due to pruning strategy on the percentage of green fruit per tree; green fruit comprised 86% and 82% of the crop on trees pruned on one side and then the other *biennially* compared to pruning both sides of the trees in every other row every other year, respectively. Logically, it is less costly to prune only one side of the tree and then the other side *biennially*, with no pruning expense every other year, compared to pruning both sides of half the trees in an orchard annually. For the research at Lindcove, we will be able to report the best pruning strategy for mitigating AB and improving yield of M+L size fruit. In the new orchard, we will be able to report the best management strategy (among NAA, urea, Accede and pruning treatments) for mitigating AB and increasing and sustaining the yield of

CVS M+L fruit and to compare the cost of each treatment relative to annual and cumulative yields of CVS M+L fruit and the uniformity of these yields across years based on ABI. Two additional years of funding will be required to support the research initiated in 2025 in the new replacement orchard.

Objective 2. Our present outlook is that our current approach of using the sum of estimated bloom to decide whether or not to implement a crop reduction strategy will work effectively in the new orchard. In our previous research, trees with sum of the bloom estimates on opposing sides of the tree between 4.5 ± 2.5 resulted in higher yields of M+L size fruit than trees with lower or higher sum of the bloom estimates (Fichtner and Lovatt, 2023). We anticipate comparable results and that the additional bloom and yield data will enable us to better define this range and improve our efforts to develop a reliable decision support tool. The more difficult aspects of objective 2 are (i) the development of a sampling method that can be used to rapidly evaluate the bloom status for a large portion of a block that is sufficient to make a decision about crop reduction for that area, and (ii) how large a portion of the orchard needs to be represented by an evaluation procedure and how much time a grower is willing to allocate to doing the evaluation to use the decision support tool. The addition of the second orchard at Lindcove provides a control for testing our estimated bloom model that ensures our success. We know our bloom model works in the Lindcove REC orchard. If it doesn't work in a new orchard but continues to work at Lindcove, then we learn that modification is required to expand its use across orchards. If the model doesn't work at a site in a specific year, then we learn that the model's efficacy is influenced by post-bloom climate as observed at the Lindcove orchard for 2023 *vs*. 2024.

Objective 3. Our ability to successfully meet objective 3 depends on climate conditions being conducive to black scale development early in the season and sufficiently hot to cause scale mortality on trees with open canopies in summer. We will select an orchard with a history of black scale that has not been treated for black scale in recent years and with black scale visibly present. We think this objective addresses an aspect of importance when deciding which, if any, crop reduction strategy to implement in an alternate bearing orchard where black scale is a potential problem. This objective adds minimal additional cost to the proposed research. The treatments necessary to meet objective 1 provide a progression from open to closed canopies that are perfect for meeting objective 3. Moreover, our collaborator Kent Daane, Professor and Cooperative Extension Specialist, is an expert on black scale. Dr. Daane has agreed to continue to provide his expertise and advice (1) to quantify black scale populations at two stages in their life cycle based honeydew produced by black scale and sooty molds that grow on the honeydew in April and again in October along with quantifying the number of mature black scale, (2) to rate the impact on fruit quality, and (3) to assist us in analyzing the data and interpreting the results, i.e., economic impact. Thus, the only additional cost is the additional salary hours for the technical staff.

Budget summary by Objectives: Note that the Year 3 budget requested by UCR is less than for Year 2, because we did not expend our full budget in year 2 at Woodlake. Despite an ON bloom, the trees set too few fruit to warrant harvesting the experiment in 2024. We also did not collect honeydew, sooty mold or black scale data at harvest due to low values in April of Year 2. Residual funds from 2024 are sufficient to partially cover the costs of treatment applications, data entry,

statistical analyses, and bloom model testing in 2025. The ANR budget increased for 2025 due to the person-hours needed to layout the expanded experiment (urea and Accede) in a new orchard (tagging trees by treatment and replication, and tagging shoots for honeydew, sooty mold and black scale evaluation). This expense occurs in 2025 only.

Objective 1 accounts for the majority of the budget needs for each PI in each year of the project as follows:

Year 1 (2023)

119 trees were tagged and harvested in Woodlake; 64 trees at Lindcove
34 trees had foliar treatments applied at two separate application times in Woodlake
68 trees were pruned in Woodlake, 64 trees in Lindcove
4 shoots on 56 trees were evaluated for honeydew, sooty mold, and black scale in April and October in Woodlake
100% of salaries for technical assistants were used for objectives 1, 2 and 3 divided as 75%, 0% and 25%, respectively; 100% of G. Klein's contract hours were used for data entry, management, statistical analyses, model testing, and data presentation divided as 50% to meet Objective 1, 40% to meet Objective 2, and 10% to meet Objective 3.

Year 2 (2024)

119 trees were NOT harvested in Woodlake; 64 trees were harvested at Lindcove
34 trees had foliar treatments applied at two separate application times at Woodlake
68 trees were pruned in Woodlake; 64 trees were pruned in Lindcove
4 shoots on 56 trees are evaluated for honeydew, sooty mold, and black scale in April, but NOT in October, at Woodlake
100% of salaries for technical assistants were used for objectives 1, 2 and 3 divided as 50%, 25% and 25%, respectively; 50% of G. Klein's contract hours were used for data entry, management, statistical analyses, model testing and data presentation divided as 50% to meet Objective 1, 40% to meet Objective 2, and 10% to meet Objective 3.

Year 3 (2025)

168 trees will be tagged, treated and harvested in a new orchard plus 30 trees to evaluate foliar-applied urea at 6% and 8%; 64 trees will be pruned
84 trees (total) will have foliar treatments applied at FB and 28 trees will be sprayed 10 DAFB in the new orchard
42 trees will be pruned in the new orchard and 64 trees will be pruned at Lindcove
4 shoots on 70 trees will be evaluated for honeydew, sooty mold, and black scale in April and October in the new orchard
168 trees will be harvest and fruit size and quality analyzed in the new orchard; 64 trees will be harvested and fruit size and quality determined at Lindcove
100% of Salaries for technical assistants will be used for objectives 1, 2 and 3 divided as 50%, 25% and 25%, respectively; 100% of G. Klein's contract hours will be used for data entry, management, statistical analyses, model testing and data presentation divided as 50% to meet Objective 1, 40% to meet Objective 2, and 10% to meet Objective 3.

Literature Cited:

Barratta, B., Caruso, T., Crescimanno, P.L, Inglese, P. 1990. Using urea as thinning agent in olive: the influence of concentration and time of application. Acta Hort. 286:163-166.

Chao, Y.Y. 2014. Alternate Bearing in Olive (*Olea europaea* L.). MS Thesis. University of California, Riverside, CA.

Fichtner, E., Lovatt, C.J. 2018. Alternate bearing in olive. Acta Hortic. 1199:103-108. doi:10.17660/ActaHortic.2018.1199.17and PGRs

Fichtner, E., Lovatt, C.J. 2023. Alternate bearing in olive - *Mitigation with properly timed foliar-applied naphthaleneacetic acid or pruning.* Acta Hortic., In review.

Fichtner, E. and Lovatt, C. 2024. Yield benefits from a new strategy using naphthaleneacetic acid to manage olive crop load. Progressive Crop Consultant, Topics in Subtropics Newsletter; UCCE SJV Website. https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=60638.

Fichtner, E.J., Y.Y. Chao, L. Ferguson, J.S. Verreynne, L. Tang and C.J. Lovatt. 2021. Repeating cycles of ON and OFF yields in alternate bearing olive, pistachio, and citrus trees — *Different mechanisms, common solutions*. Acta Hortic. 1315. DOI 10.17660.

Hegazi, E.S., Hegazi, A.A., El Kholly, D.M. 2017. Effect of some chemical thinning agents on fruit quality and oil content of Manzanillo and Eggizi Shami olive cultivars. J. Plant Production, 8(2):315-320.

Osman, I.M.S. 2013. Effect of different concentrations of foliar applications of urea, NAA and ethrel on fruit thinning of 'Dolce' olive cv. Egypt. J. Hort. 40(1):133-142.

Pearce, S.C. and S. Dobersek-Urbanc. 1967. The measurements of irregularity in growth and cropping. J. Hort. Sci. 42(3):295–305.

Sibbett, S. 2000. Alternate bearing in olive trees. California Olive Oil News. 3(12),1

Table 1. Effect of pruning (hedging and topping to 14 feet) 28 days after full bloom (DAFB) to one side of the tree and then the other side *biennially versus* pruning 28 (DAFB) on both sides of the trees in every other row every other year on annual and 2-year cumulative total yield and yield of commercially valuable medium plus large (M+L) size fruit as kg/tree averaged across treated and untreated rows as specified below for 2023 and 2024. Trees were harvested in October each year.

Treatments	2023 total yield (M+L size fruit) (kg/tree)	2024 total yield (M+L size fruit) (kg/tree)	2023-2024 cumulative total yield (M+L size fruit) (kg/tree)
Pruned 28 DAFB on west side of the tree in 2023; pruned on the east side in 2025 (no trees were pruned in 2024	56 a (7 a)	101 a (44 a)	158 a (52 a)
Pruned 28 DAFB on both sides of the tree in years 2023 and 2025 and the other row pruned 28 DAFB on both sides of the tree in 2024	46 a (4 a)	91 a (36 a)	142 a (40 a)
P-value	0.2916 (0.2861)	0.3521 (0.1847)	0.6335 (0.1295)

[z] In 2023, trees were pruned and topped on June 20, 2023, and harvested in October. In 2024 trees were pruned and topped on June 3, 2024, and harvested in October.

[y] Mean values within a vertical column followed by different letters are significantly different at the specified *P* level by Fisher's Protected LSD test.

University of California, Riverside Budget
Project Period: 01/01/25-12/31/25

ITEM	2025 Budget
PERSONNEL:	
Personnel Subtotal:	**0**
FRINGE BENEFITS:	
	0
	0
SUPPLY/SERVICES, OTHER	
Field work: Individual contractors: (1) Recharge to Lindcove REC – spraying off-site; I.G. Harvesting (billed through Lindcove REC - pruning treatments and harvesting data trees = $5,500; (3) Independent contractor-Grant Klein-statistician-data entry, statistical analyses, model design and testing, tables and figures $3,000.	8,500
Services Subtotal:	**8,500**
TRAVEL:	
Field Work: Vehicle Use: four roundtrips UCR to Woodlake and Lindcove (512 mi x 4 = 2,048 mi x $0.677/mi) = $1,387	1,387
Lodging; $187 x 3 nights = $561	561
Meals: $79/day x 3 days = $237	237
Travel Subtotal:	**2,185**
CONTRACTUAL	
Subaward to Elizabeth Fichtner	23,124
Contractual Subtotal:	**23,124**
UCR TOTAL DIRECT COSTS w/o exclusions (figure out IDC):	**10,685**
UCR INDIRECT COSTS @ 11% TDC:	**1,175**
UCR TOTAL DIRECT COSTS - to PI Carol Lovatt:	**11,860**
UCR + ANR Grant TOTAL:	**34,985**
UCANR	**23,124**
UCR Budget	**11,860**
UCANR + UCR	**34,984**

University of California, ANR Budget
Project Period: 01/01/25-12/31/25

ITEM	2025 Budget
PERSONNEL:	
Research assistant $61,300/year @ 21% time = $12,873	12,873
Personnel Subtotal:	**12,873**
FRINGE BENEFITS: 41% x $12,873 = $5,278	5,278
Fringe Benefits Subtotal:	**5,278**
SUPPLY/SERVICES, OTHER	2,275
Field work: Lindcove REC: Field assistants for tagging trees, collecting fruit samples, analyses of fruit size and quality, and harvest (61.5 person-hours x $37/person-hour) = $2,275	
Services Subtotal:	**2,275**
TRAVEL:	
COC work: Vehicle Use: Ten roundtrips to orchards in Woodlake and Lindcove (601 mi round trip @ $0.677/mi = $406)	406
Other Direct Costs (GAEL)	
Travel Subtotal:	**406**
CONTRACTUAL	
Contractual Subtotal:	**0**
ANR Total Direct Cost	**20,832**
Exclusion amount (Subs)	**0**
ANR TOTAL DIRECT COSTS w/o exclusions (figure out IDC):	**20,832**
ANR INDIRECT COSTS @ 11% TDC:	**2,292**
ANR to PI Elizabeth Fichtner Grant TOTAL:	**23,124**

University of California, Riverside Budget
Project Period: 01/01/23-12/31/25

ITEM		2023-25 Budget
PERSONNEL:		
		0
		0
		0
	Personnel Subtotal:	**0**
FRINGE BENEFITS:		
		0
		0
		0
	Fringe Benefits Subtotal:	**0**
SUPPLY/SERVICES, OTHER		
Yr 1 Field work		16,143
Yr 2 Field work		17,640
Yr 3 Field work		8,500
	Services Subtotal:	**42,283**
TRAVEL:		
Yr 1 Travel		5,864
Yr 2 Travel		3,006
Yr 3 Travel		2,185
	Travel Subtotal:	**11,055**
CONTRACTUAL		
Yr 1 Subaward to Elizabeth Fichtner		12,084
Yr 2 Subaward to Elizabeth Fichtner		10,908
Yr 3 Subaward to Elizabeth Fichtner		23,124
	Contractual Subtotal:	**46,116**
	UCR TOTAL DIRECT COSTS w/o exclusions (figure out IDC):	**53,338**
	UCR INDIRECT COSTS @ 11% TDC:	**5,867**
	UCR TOTAL DIRECT COSTS - to PI Carol Lovatt:	**59,205**
	UCR + ANR Grant TOTAL:	**105,321**
	UCANR	**46,116**
	UCR Budget	**59,205**
	UCANR + UCR	**105,321**

University of California, ANR Budget
Project Period: 01/01/23-12/31/25

ITEM	2023-25 Budget
PERSONNEL:	
Yr 1 Salary (Junior Specialist at 9% FTE)	4,495
Yr 2 Salary (Junior Specialist at 9% FTE)	7,731
Yr 3 Salary (Junior Specialist at 9% FTE)	12,873
Personnel Subtotal:	25,099
FRINGE BENEFITS:	
Yr 1 Benefits (38.9%)	1,748
Yr 2 Benefits (38.9%)	0
Yr 3 Benefits (38.9%)	5,278
Fringe Benefits Subtotal:	7,026
SUPPLY/SERVICES, OTHER	
Yr 1 Field work	1,440
Yr 2 Field work	1,440
Yr 3 Field work	2,275
Services Subtotal:	5,155
TRAVEL:	
Yr 1 Travel	3,203
Yr 2 Travel	656
Yr 3 Travel	406
Travel Subtotal:	4,265
CONTRACTUAL	
Contractual Subtotal:	0
ANR Total Direct Cost	41,545
Exclusion amount (Subs)	0
ANR TOTAL DIRECT COSTS w/o exclusions (figure out IDC):	41,545
ANR INDIRECT COSTS @ 11% TDC:	4,570
ANR To PI Elizabeth Fichtner Grant TOTAL:	46,115

Approved by:

PRIMARY PI SIGNATURE PAGE: UNIVERSITY OF CALIFORNIA

Originator's Signature	11/17/2024 Date
Department Chair/County Director	Date
Liaison Officer	12/3/2024 Date

Approved by:

PRIMARY PI SIGNATURE PAGE: UNIVERSITY OF CALIFORNIA

10/24/2024
Originator's Signature Date

11/18/24
Department Chair/County Director Date

11/18/2024
Liaison Officer Date

****ACTION REQUIRED****

FROM: COC RESEARCH SUBCOMMITTEE

SUBJECT: INTER-ITEM TRANSFERS OF THE RESEARCH BUDGET

RECOMMENDATION: THAT the Committee grant authority to the Executive Director and Chairman for inter-item transfers of the Research Budget.

****ACTION REQUIRED****

FROM: CALIFORNIA OLIVE COMMITTEE

SUBJECT: APPROVAL 2025 FISCAL BUDGET

RECOMMENDATION: THAT the Committee adopt the 2025 FY Budget.

BACKGROUND: The following is the proposed total 2025 FY Budget.

TOTAL 2025 BUDGET

BUDGETS	MARKETING	RESEARCH	INSPECTION	EXECUTIVE	TOTAL
2025	**$207,500**	**$392,097** **$314,114.20** **(w/o NCEs)**	**$65,000**	**$510,100**	**$1,174,697** **$1,096,714.20** **(w/o NCEs)**

FISCAL IMPACT: $1,096,714.20

TOTAL 2024 BUDGET

BUDGETS	MARKETING	RESEARCH	INSPECTION	EXECUTIVE	TOTAL
2024	**$197,500**	**$302,750.80** **$251,072** **(w/o NCEs)**	**$85,000**	**$514,900**	**$1,100,150.80** **$1,048,472** **(w/o NCEs)**

FISCAL IMPACT: $1,048,472

****ACTION REQUIRED****

FROM: CALIFORNIA OLIVE COMMITTEE

SUBJECT: APPROVAL OF 2025 ASSESSMENT RATE

RECOMMENDATION: THAT the Committee adopt the 2025 Assessment Rate.

BACKGROUND: The following is the proposed 2025 Assessment Rate.

HISTORIC BUDGET, TONNAGE & ASSESSMENT COMPARISON

FISCAL YEAR	*2024*	*2023*	*2022*	*2021*
Budget	$1,100,150.80 $1,048,472 (w/o NCEs)	$1,154,412.20 $1,096,665.30 (w/o NCEs)	$1,245,085.30 $1,176,980.10 (w/o NCEs)	$1,151,831.62 $1,135,660.42 (w/o NCEs)
$ Change	$(54,261.40)	$(90,673.10)	$93,253.68	$116,425.62
Tonnage	37,840.84	19,912.36	46,359.40	23,192.73
Assessment Rate	$28	$35	$16	$30

2025 (Proposed)	
Budget	$1,174,697 $1,096,714.20 (w/o NCEs)
$ Change	$74,546.20
Tonnage	48,560.34
Assessment Rate	Unknown

Form COC 2 CALIFORNIA OLIVE COMMITTEE OMB No. 0581-0178

Rev. 12/18

Claim for Expenses—Committee Members only

Type of Meeting_____ Meeting Date_____ Meeting Location_____

Fill out this Section 1: to claim PER DIEM: **(Per Diem: $100.00 per day in *6 hour increments)** FOR COC USE

Point of Departure_____

Time of Departure _____A.M._____P.M. Time Returned_____A.M._____P.M. $_____

Date Departed:_____Date Returned:_____PER DIEM CLAIMED_____ $_____

Fill out this section to claim TRANSPORTATION EXPENSES:

Auto_____ Auto Mileage _____**(at .67 per mile)** $_____ $_____

Fill out this section to claim ACTUAL ROOM & MEAL EXPENSES:

HOTEL: ATTACH RECEIPT $_____ $_____

MEALS: Date: _____ _____ _____

Breakfast: _____ _____ _____

Lunch: _____ _____ _____

Dinner: _____ _____ _____

TOTAL: _____ _____ _____ $_____

MISCELLANEOUS:

Explain: _____ $ _____

Explain: _____ $ _____

TOTAL EXPENSES: $_____ $_____

Date Submitted_____ Name (PLEASE PRINT):_____ Approved: _____

Signature:_____ Account#: _____

PROCEDURE FOR FILING CLAIM FOR EXPENSES- FORM COC-2
FOR COMMITTEE MEMBERS ONLY

General: Claims for reimbursement of reasonable expenses must be submitted on Form COC-2: **NO LATER THAN 30 DAYS FOLLOWING MEETING DATE WHEN EXPENSES INCURRED. Please email completed forms to Leslie Hovsepian at bookkeeper@calapple.org.**

FIRST SECTION
Per Diem: Fill out FIRST SECTION of Form COC-2.

TIME AND DATE OF DEPARTURE AND RETURN MUST BE FILLED OUT.
Per Diem may be claimed in quarter days/or by 6 hour increments = $25.00, not to exceed $100 per day.

SECOND SECTION
Transportation: Fill out SECOND SECTION of Form COC-2. **RENTAL CAR RECEIPTS MUST BE ATTACHED** for reimbursement**.**

THIRD SECTION
Meal & Hotel Expenses: Fill out THIRD SECTION of Form COC-2. **MEAL RECEIPTS/ HOTEL RECEIPTS MUST BE ATTACHED** for reimbursement**.**

Miscellaneous: List other out-of-pocket expenses. For example: taxi, supplies, bridge tolls

RECEIPTS MUST BE ATTACHED for reimbursement**.**