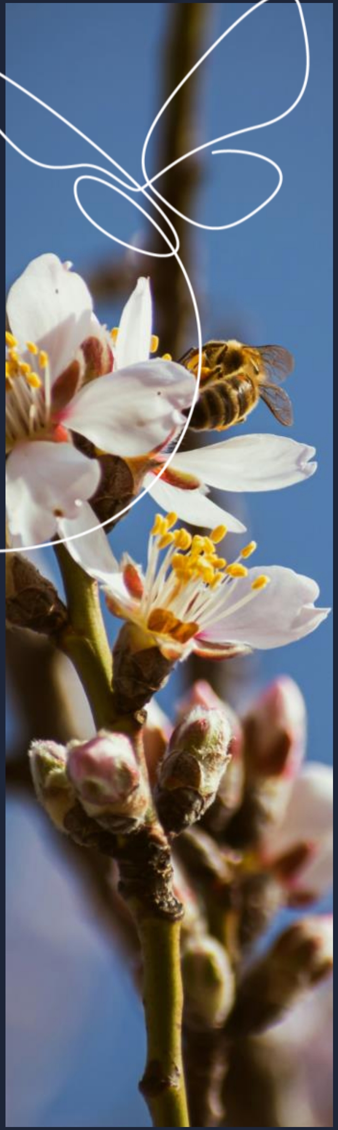
2024

ROOTED TOGETHER

THE ALMOND CONFERENCE



2024

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New Pests and the Prevention Against Future Invasions

Moderator: Lauren Fann (ABC)

Speakers: Florent Trouillas (UC Davis), Houston Wilson (UC Riverside), Joshua Kress (California Department of Food & Agriculture)

Red Leaf Blotch:

a new and invasive disease of almond in California

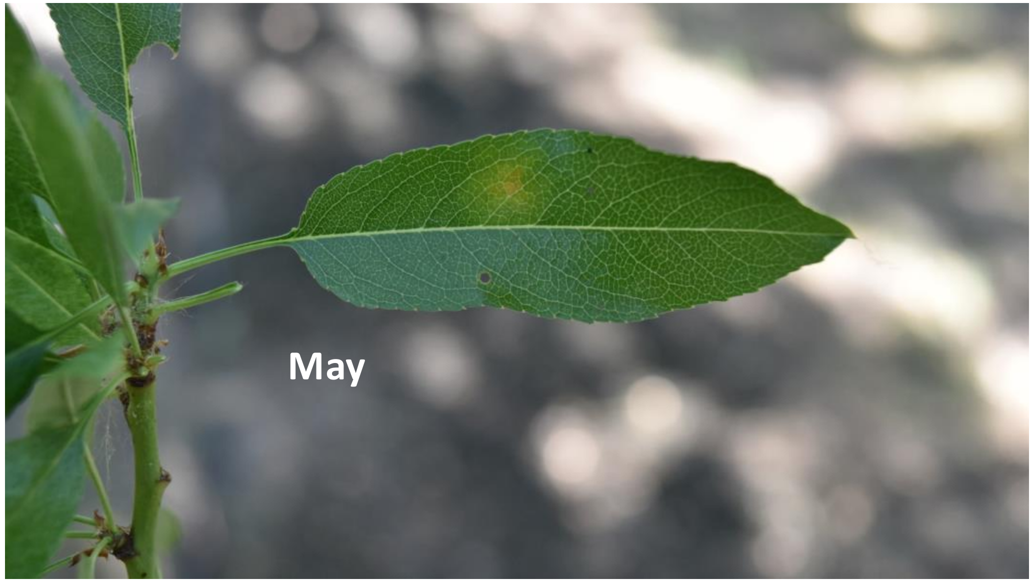
Florent P. Trouillas
Associate Professor of Cooperative Extension
University of California, Davis

ALMOND BOARD OF CALIFORNIA

Red leaf blotch

- ❑ Red leaf blotch (RLB) caused by the fungal pathogen ***Polystigma amygdalinum*** is one of the most important leaf diseases currently affecting almond trees in the **Mediterranean basin**, particularly in **Spain**, and regions of the Middle East
- ❑ First described in **1843 in France** from almond leaves
- ❑ **First detected May 29, 2024, in Merced County**
- ❑ A new, **invasive** disease of almond for California
- ❑ It only affect **leaves** of almond

Symptoms



Symptoms

All leaves and trees may be infected in an orchard

Trees defoliate by the end of August

- ❑ **Leaves on the ground (leaf litter) will serve as inoculum for next growing season**

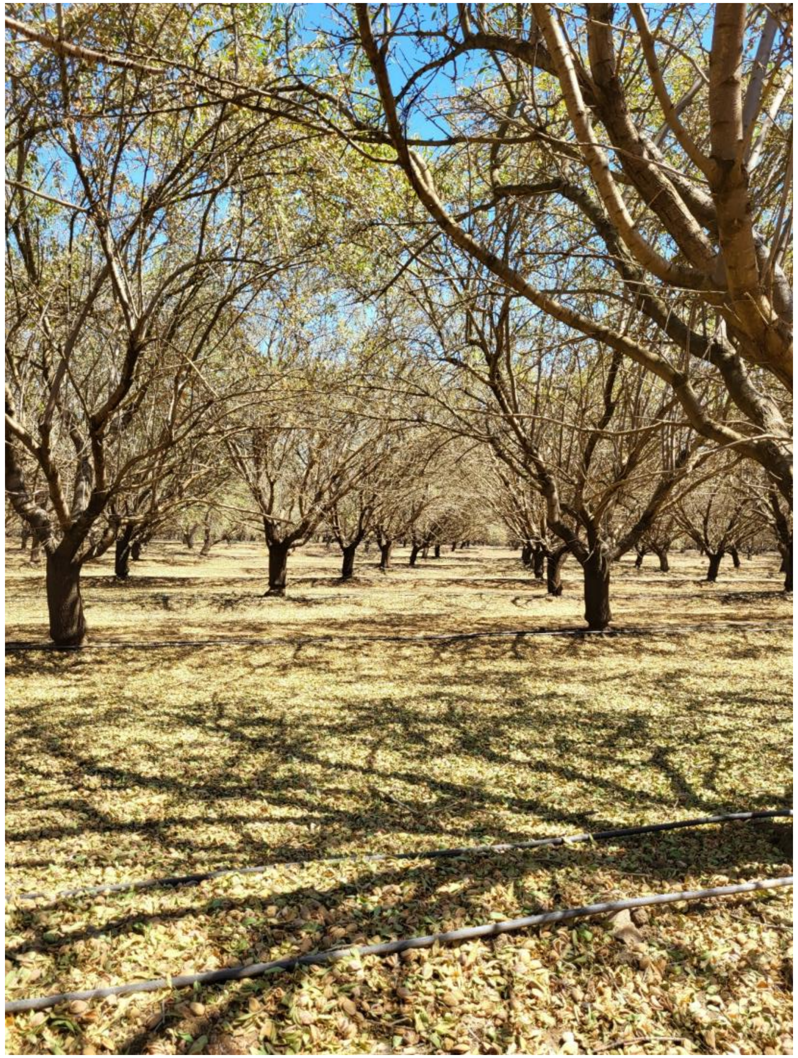
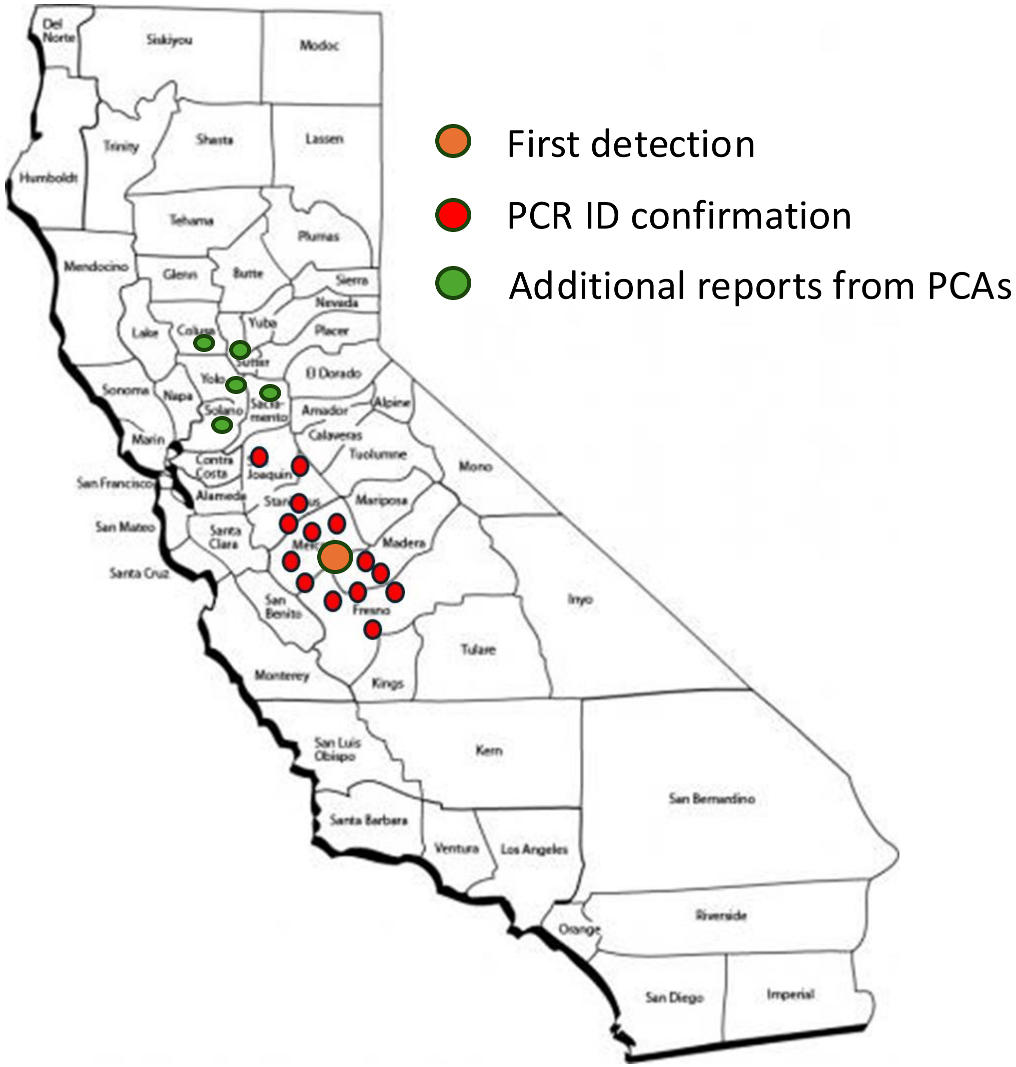




Photo credits Cameron Zuber

Current disease distribution

- ❑ First detection in May 2024 in Merced Co (CE advisor Cameron Zuber)
- ❑ Now detected in Madera, Merced, Fresno, San Joaquin, and Stanislaus Counties and Sacramento Valley
- ❑ Cultivars affected included Aldrich, Butte, Carmel, Fritz, Independence, Monterey, Nonpareil, Padre, Shasta, and Wood Colony



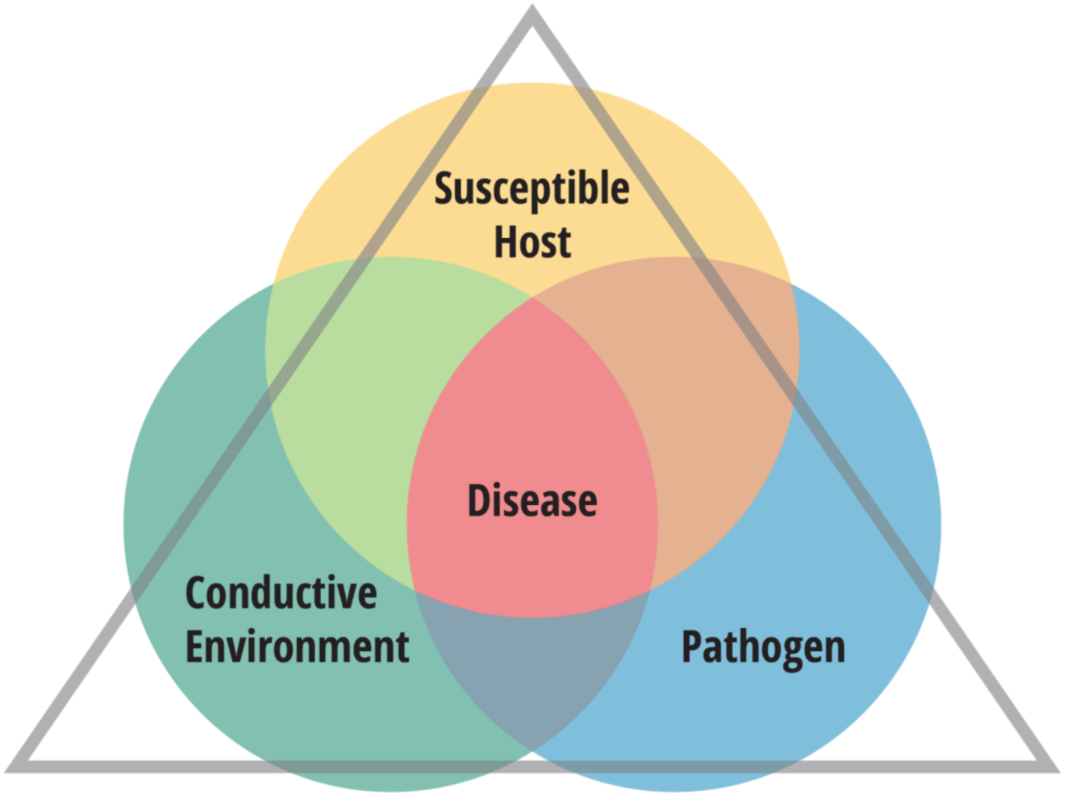
Disease emergence

- Intensification of agricultural practices
- Global warming and climate change, atmospheric rivers
- Expanded geographical distribution of the host
- **Movement of plant material into California**
- **Pathogen introduction**
- Reduced fungicide applications in orchards

Plant Disease Triangle

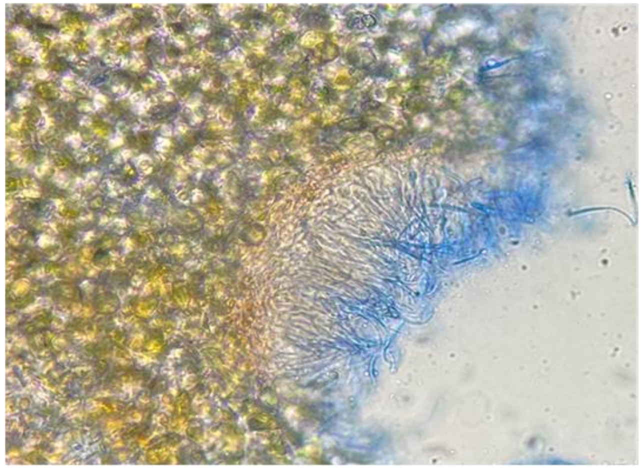
A plant disease and disease outbreaks results when three factors are in place:

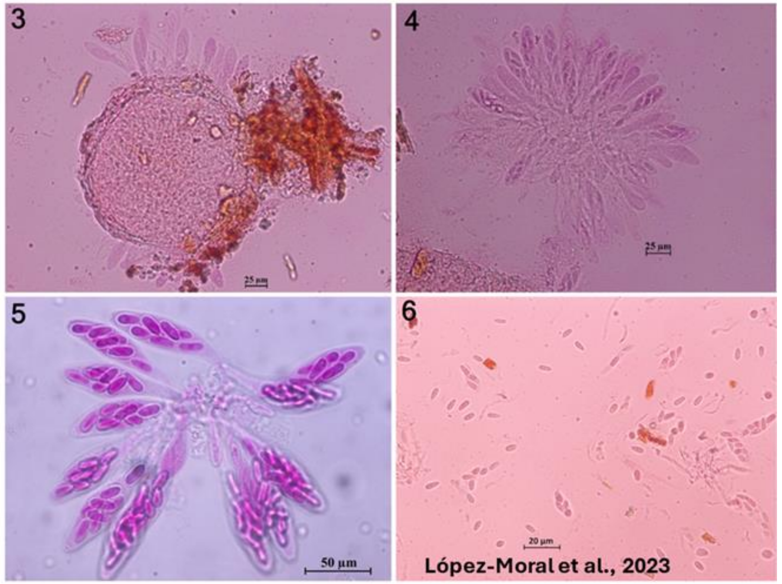
- **Host - A susceptible host plant is available**
- **Pathogen - A pathogen is present**
- **Environment - Environmental conditions that favor the host and pathogen to allow disease development**



The pathogen: *Polystigma amygdalinum*

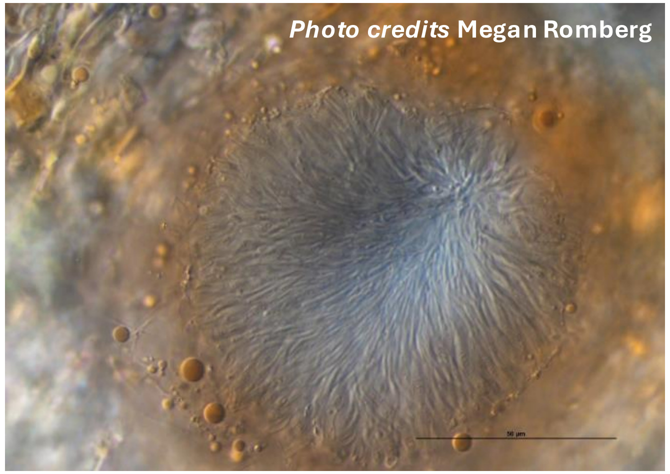
- *P. amygdalinum* is an **obligate biotrophic** fungal pathogen, and is dependent on living plant tissue for growth, reproduction, and feeding and cannot be grown on culture medium.





Disease cycle

- The disease only affect leaves of *Prunus dulcis*
- It is monocyclic, with only one primary infection cycle
- 35 to 40 days incubation period



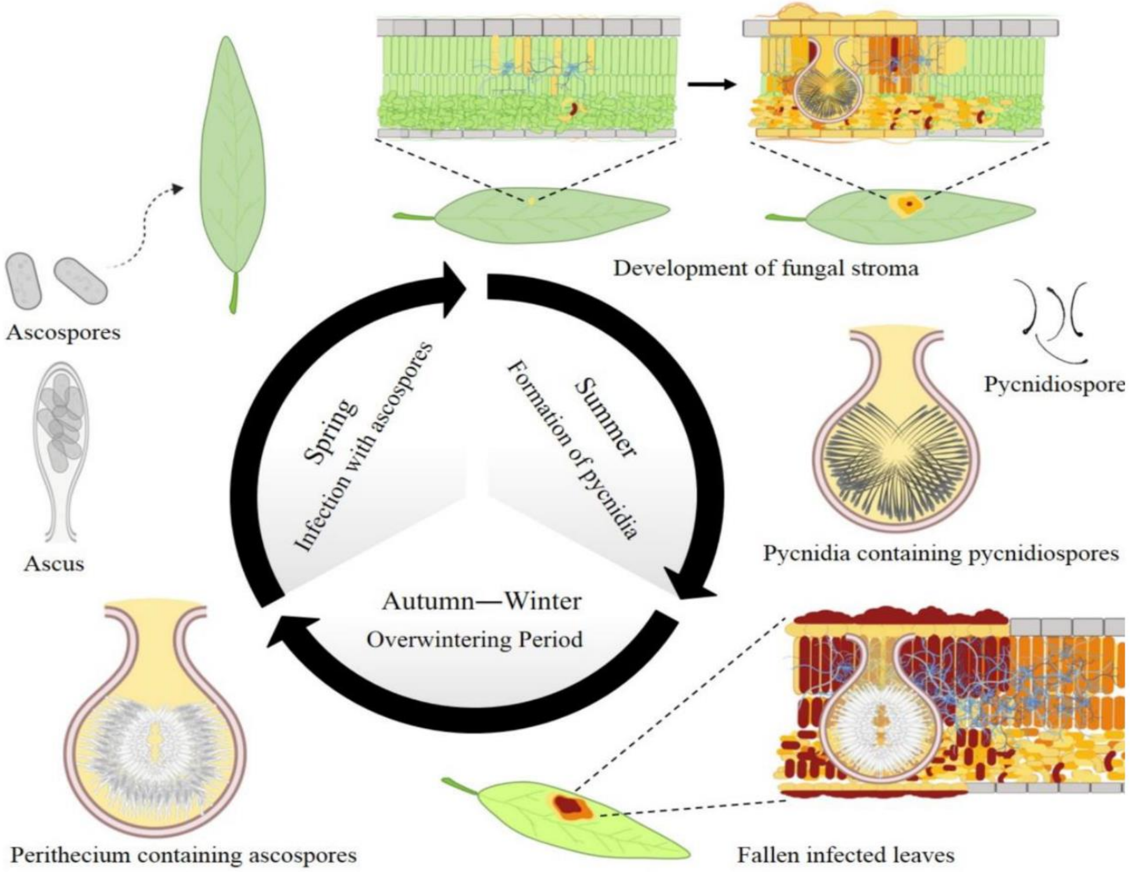


Figure 1.6 Schematic life cycle of *Polystigma amygdalinum* on *Prunus dulcis* leaves assumed by field observations. From: Erick Zúñiga, modified from Suzuki *et al.* (2008).

Disease cycle

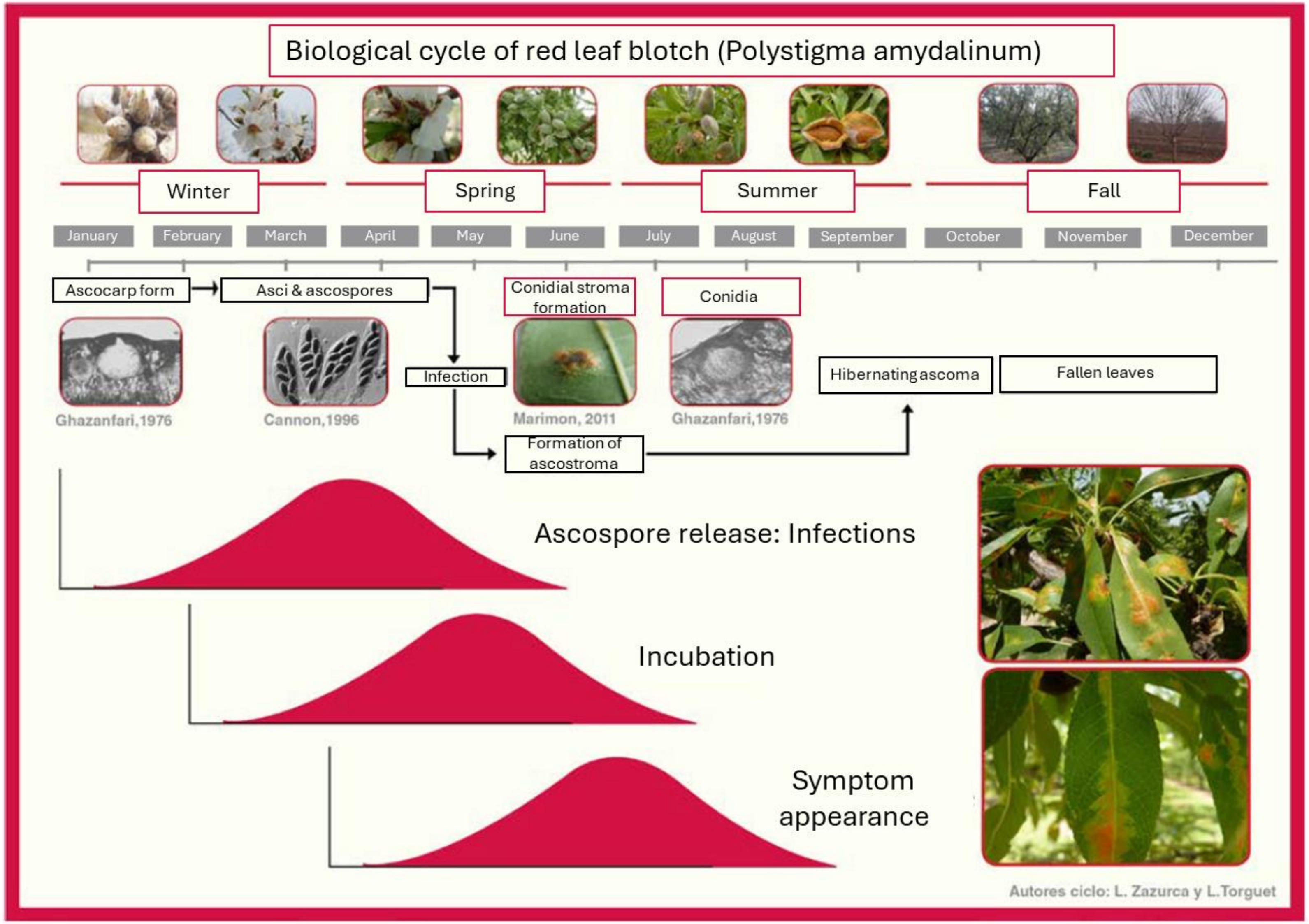
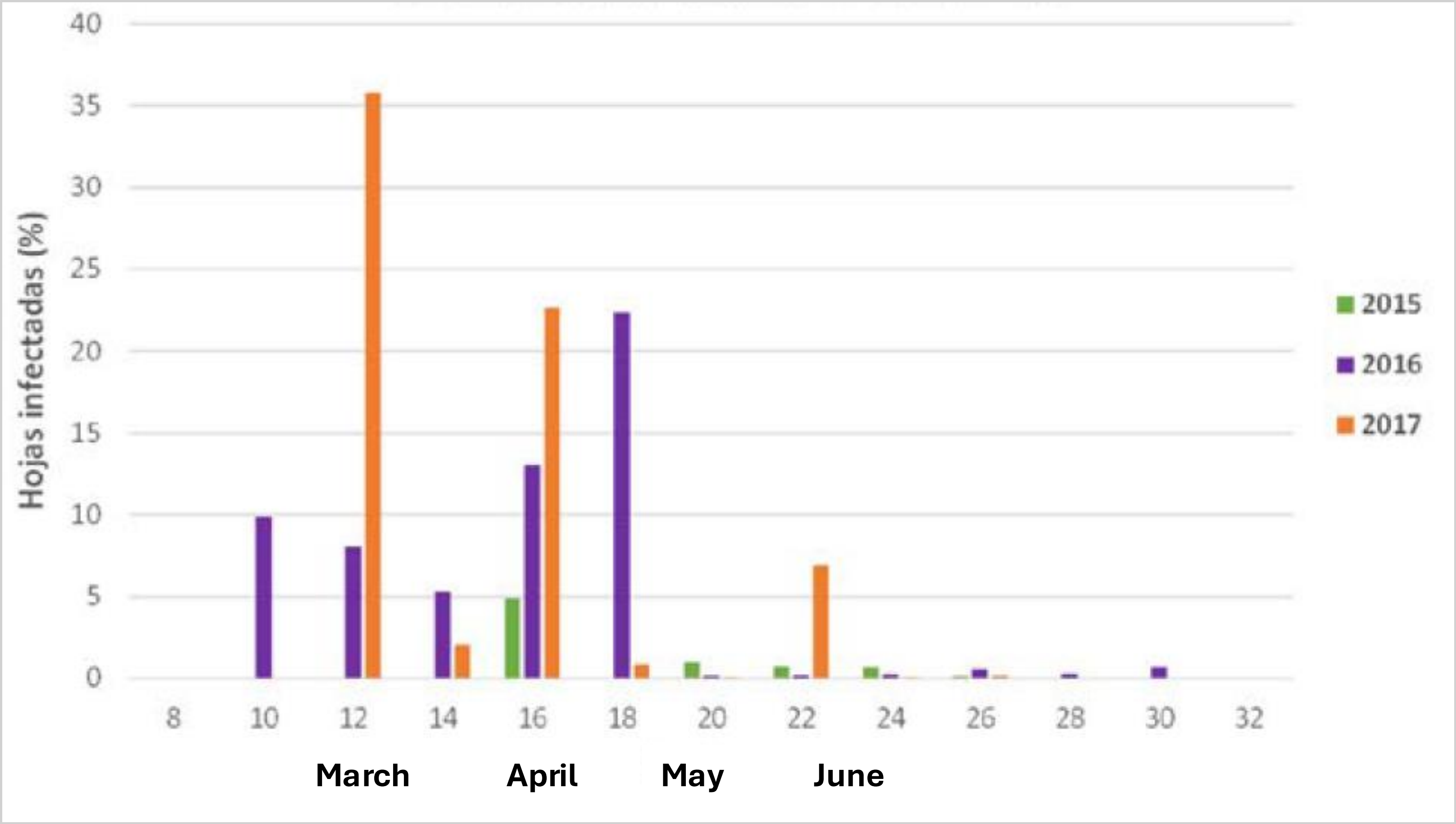


Figure credits: Gemma Pons-Solé, Xavier Miarnau, Laura Torguet, Lourdes Zazurca, Erick Zúñiga, Jordi Luque, IRTA Barcelona-Lleida.

Disease biology

Period of infection/host susceptibility (Spain)



Dynamic of spore inoculum (Spain)

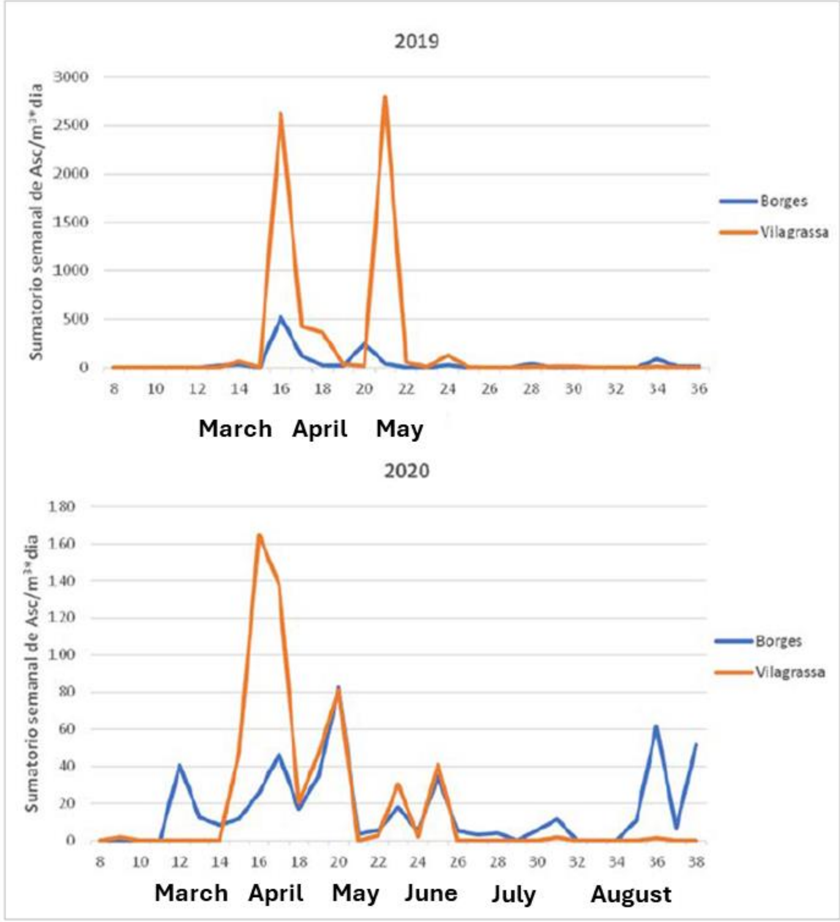
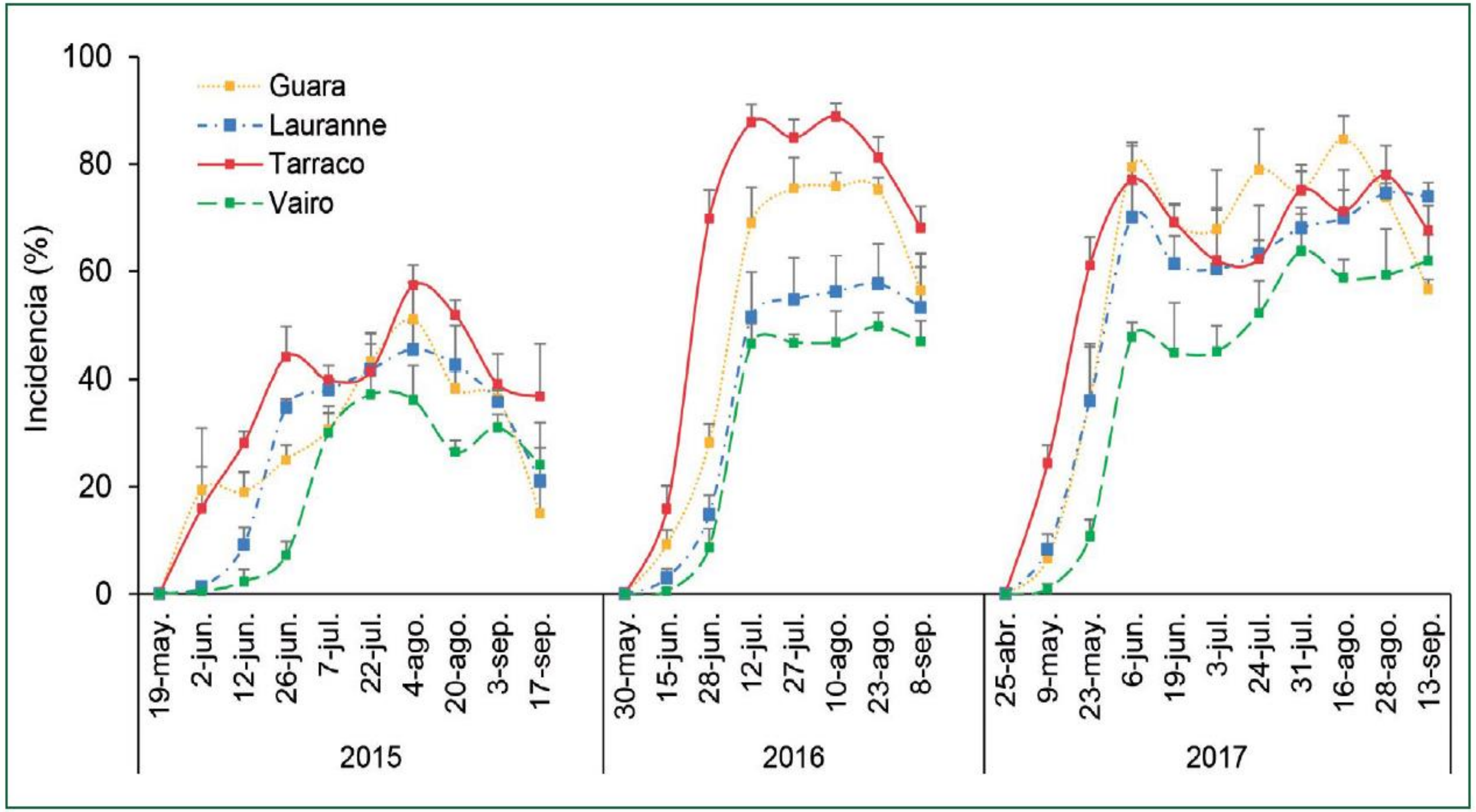


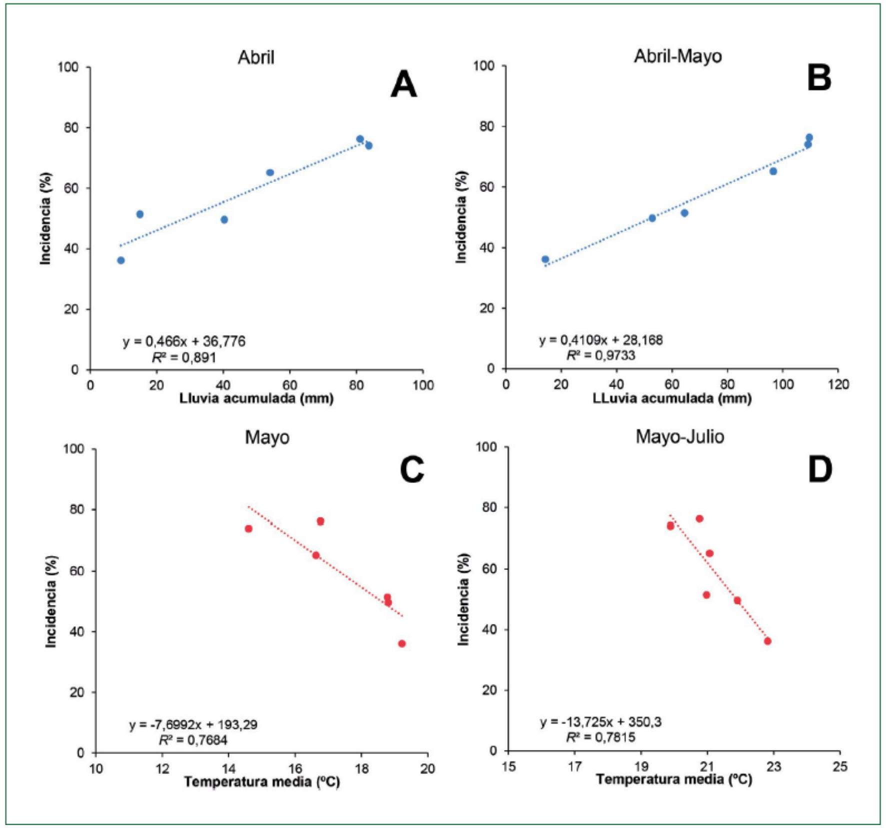
Figure credits: Gemma Pons-Solé, Xavier Miarnau, Laura Torguet, Lourdes Zazurca, Erick Zúñiga, Jordi Luque, IRTA Barcelona-Lleida.

Disease dynamic

- Seasonal progression of disease incidence (percentage of leaves with symptoms) from May to September (Spain)



- Linear regressions between the average annual incidence leaf spots and: A) the accumulated precipitation in April, (B) the precipitation of the April–May period, (C) the average temperature of May, and (D) the average temperature between May and July (Spain).



L. TORGUET, L. ZAZURCA, E. ZÚÑIGA, J. LUQUE, X. MIARNAU, **IRTA–Lleida and Cabrils.** *revista de Fruticultura • Nº83 septiembre | octubre 2021*

Disease detection

- We validated a PCR assay that uses species-specific primers following DNA extraction directly from plant tissues (leaves)

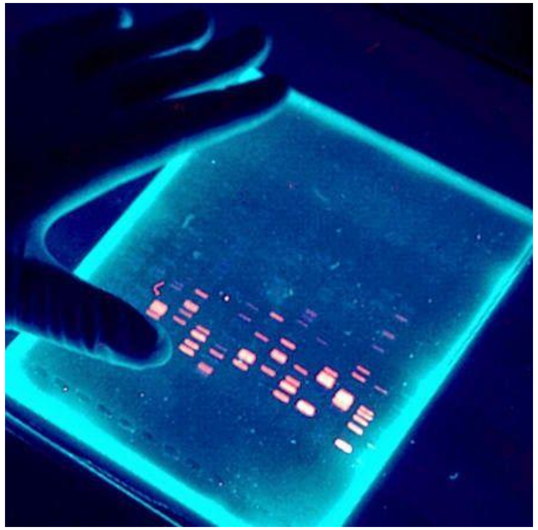
- Pathogen ID confirmed by CDFA and the USDA

RESEARCH PAPERS

A qPCR-based method for detection and quantification of *Polystigma amygdalinum*, the cause of red leaf blotch of almond

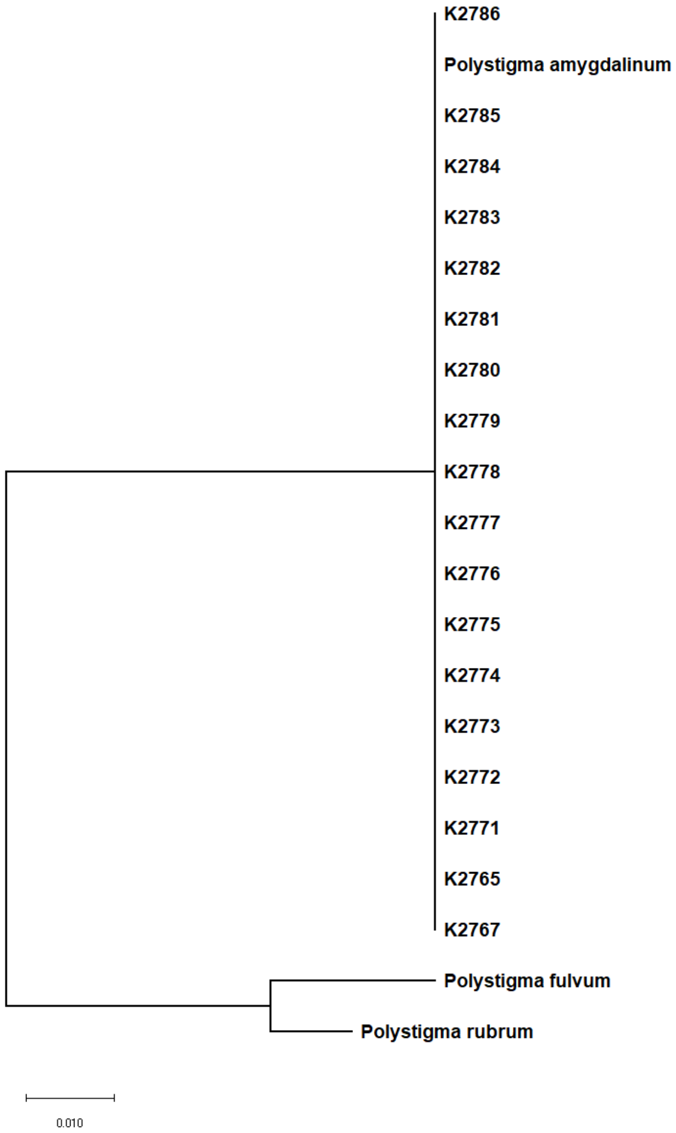
Erick Zúñiga[1,2], Maela León[3], Mónica Berbegal[3], Josep Armengol[3] and Jordi Luque[1]

[1] Plant Pathology, IRTA Cabrils. Carretera de Cabrils km 2, 08348 Cabrils, Spain
[2] Unitat de Fisiologia Vegetal, Facultat de Biociències, Universitat Autònoma de Barcelona, 08193 Bellaterra, Spain
[3] Instituto Agroforestal Mediterráneo, Universitat Politècnica de València. Camino de Vera s/n, 46022 València, Spain



Population genetic diversity

- Investigating *P. amygdalinum* population **genetic diversity**
- Our hypothesis is that the population is genetically poorly diverse due to the recent introduction of the pathogen and expected resulting genetic bottleneck
- Determine the existence of subpopulations (multiple introductions)
- Compare with European isolates



Multigene phylogeny using ITS and LSU gene regions

Disease control

<u>Cultural practices</u>:

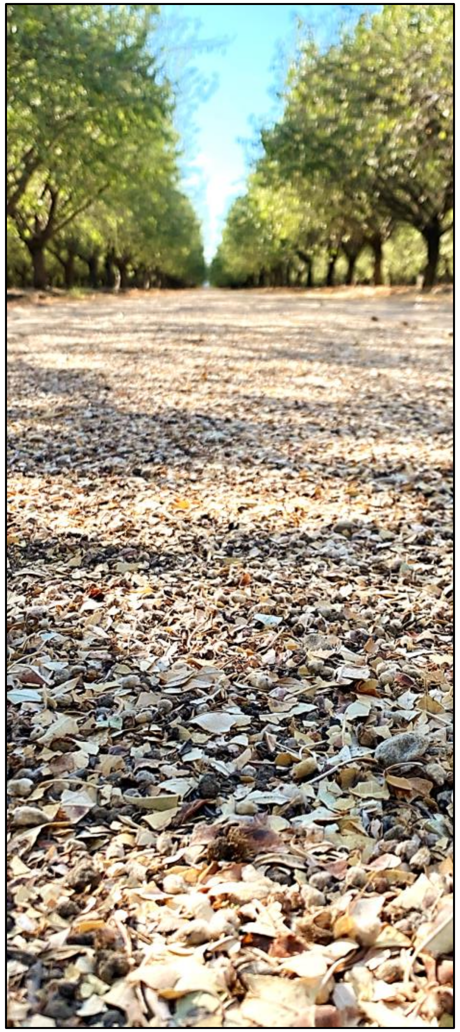
- ❑ Cultural practices focused on **eliminating the primary inoculum of infected fallen leaves** can help mitigate the disease

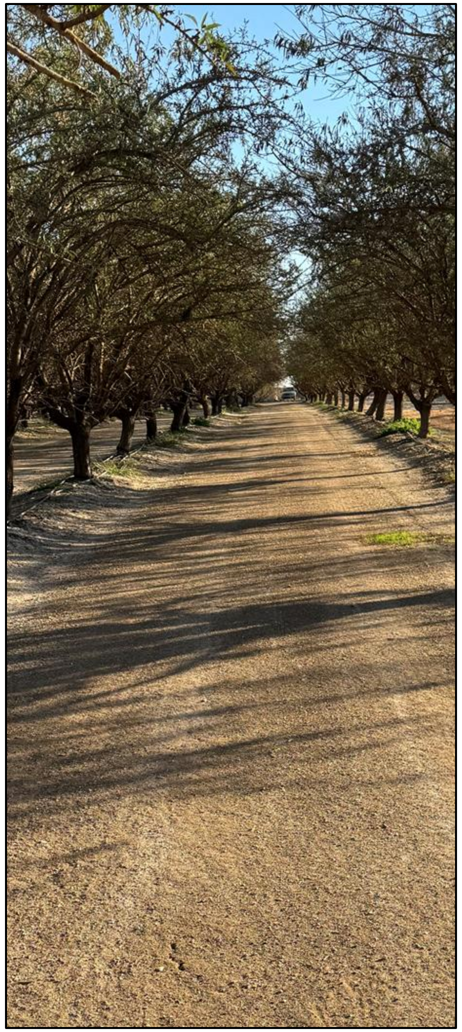
- ❑ **Zinc sulfate** to hasten leaf fall, removing leaf litter or applying urea to accelerate leaf decomposition

- ❑ However, such strategies are only effective **when applied over a wide area**

- ❑ **Cleaning harvest and spray equipment** between orchards

- ❑ **Fungicides applied during bloom and after symptoms are visible are not effective**





Diseases control

Timing of fungicide applications

- **Fungicides applied during bloom and after symptoms are visible are NOT effective**

Disease	Dormant	Bloom			Spring[1]		Summer	
		Pink bud	Full bloom	Petal fall	2 weeks	5 weeks	May	June
Red leaf blotch	----	----	----	+++	+++	+++	++	+
Anthracnose[2]	----	++	+++	+++	+++	+++	+++	++
Bacterial spot	+	----	++	+++	+++	++	+	----
Brown rot	----	++	+++	+	----	----	----	----
Green fruit rot	----	----	+++	++	----	----	----	----
Hull rot[7]	----	----	----	----	----	----	----	+++
Leaf blight	----	----	+++	++	+	----	----	----
Rust	----	----	----	----	----	+++	+++	+[6]
Scab[3]	++	---	---	++	+++	+++	+	---
Shot hole[4]	+[5]	+	++	+++	+++	++	----	----

Rating: +++ = most effective, ++ = moderately effective, + = least effective, and ---- = ineffective

Adaskaveg et al. 2017

Diseases control

Best timing of fungicide applications and best products

- FRAC **groups <u>7 (SDHI: fluopyram, boscalid), 11 (QoI: trifloxistrobin, pyraclostrobin), M3 (ziram, mancozeb), M4 (captan)</u>** and some FRAC3 (DMI, **fenbuconazole**) are most effective (*Torguet et al. 2022*)
- Mixed fungicides (7/11, 7/3) (*Torguet et al. 2022*)

Disease	Dormant	Bloom		Spring			Summer	
		Pink bud	Full bloom	Petal fall	2 weeks	5 weeks	May	June
Rust	----	----	----	----	----	3, 3/7, 3/11 3/33, 7, 7/11, 11, 19 M3	3, 3/7, 3/11 3/33, 7, 7/11, 11, 19	3, 3/7, 3/11 3/33, 7, 7/11, 11, 19
Scab[4]	M1+oil, M2[3], M5+oil	----	----	1[2], 3/7, 3/9, 3/11, 3/33, 7, 7/11[2] 11[2] M3 M4, M5	1[2], 3/7, 3/9, 3/11, 3/33, 7, 7/11[2] 11[2] M3 M4, M5	3, 3/7, 3/9, 3/11 3/33, 7, 7/11[2], 11[2] M2[3] M3, M4	M2[3] M4	----
Shot hole	M1	2 3, 3/7, 3/9, 3/11, 7, 9, 11	2 3, 3/7, 3/9, 3/11 7, 7/11 9, 11, 19	2 3, 3/7, 3/9, 3/11 7, 7/11 9 11, 19	7, 7/11 11, 19 M3 M4 M5	7, 7/11 11, 19 M3 M4 M5	----	----

Adaskaveg et al. 2022

Chemical control

CLASSIFICATION OF PRODUCTS BASED ON THEIR EFFICACY AGAINST RED LEAF BLOTCH (SPAIN)

Laura Torguet et al. 2022. *IRTA. Programa de Fruticultura. Parque de Gardeny-Edificio Fruitcentre. Lleida, Spain.*

Type of fungicide	Very high efficacy [1] >90%	High efficacy [2] 90-60%	Medium efficacy [3] 59-40%	Low efficacy 39-20%	Very low efficacy <20%
Systemic	Fluopyram (7) + trifloxystrobin (11) Fluopyram (7) Pyraclostrobin (11) + boscalid (7) Trifloxystrobin (11) Fluopyram (7) + tebuconazole (3)	Fenbuconazole (3) Isopyrazam (7) + difenoconazole (3) Tebuconazole (3) Cyproconazole (3) Penthiopyrad (7)	Cyprodinil (9) + fludioxonil (12) Fenpyrazamine (17) Myclobutanil (3)	Cyflufenamid (U6)	Pirimetanil (9)
Translaminar	-	Dodine (U12)	-	Folpet (M04)	
Contact	-	-	Captan (M04)	Copper compounds (M01)	

Disclaimer: All chemicals must be applied following the chemical label, local and federal regulations. Please check with your pest control adviser to confirm fungicide registration, rates and site-specific restrictions.

[1] e.g. Luna Sensation, Luna Experience, Luna Privilege, Pristine, Adament
[2] e.g. Indar, Enable, Inspire, Inspire Super, Elite, Miravis Duo, Fontelis
[3] e.g. Switch, Rally

Current Research

- ❑ **Objective 1:** Establish the current distribution of Red Leaf Blotch in California **(Summer 2025)**
- ❑ **Objective 2:** Validation of a PCR-based assay for fast and reliable detection and identification of the RLB pathogen from almond leaves and genetic diversity of *P. amygdalinum* **(On-going)**
- ❑ **Objective 3:** Complete Koch's postulates (pathogenicity studies) **(Spring 2025)**
- ❑ **Objective 4:** Determine the disease cycle in California, spore trapping studies **(Jan 2025)**
- ❑ **Objective 5:** Evaluate the efficacy of conventional and biological fungicides for the management of RLB **(Spring 2025)**
- ❑ **Objective 6:** Outreach and Education

Thank you!

<u>Cooperating personnel</u>:

<u>Alejandro Hernandez Rosas</u>, PhD student KARE-UC Davis
<u>Renaud Travadon</u>, Project Scientist, UC Davis
<u>Rosa Jaime-Frias</u>, Laboratory Assistant, KARE-UC Davis
<u>Tawanda Maguvu</u>, Postdoctoral scholar, KARE-UC Davis
<u>Cameron Zuber</u>, Farm advisor, UCCE Merced County
<u>Brent Holtz</u>, Farm advisor, UCCE San Joaquin County
<u>Roger Duncan</u>, Emeritus Farm advisor, UCCE San Joaquin County
<u>Phoebe Gordon</u>, Farm advisor, UCCE Tulare County
<u>Mae Culumber</u>, Farm advisor, UCCE Fresno County

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New Pests and the Prevention Against Future Invasions

Speaker: Houston Wilson (UC Riverside)

Carpophilus Beetle

A New Invasive Pest of Almonds in California

Houston Wilson - Assoc. Coop. Ext. Specialist, Kearney Ag. Research and Extension Center, Dept. Entomology, Univ. of California - Riverside

Jhalendra Rijal - IPM Advisor – N. San Joaquin Valley, UC Agriculture and Natural Resources

David Haviland - Entomology Farm Advisor, Kern Co., UC Agriculture and Natural Resources

Sudan Gyawaly - IPM Advisor – Sacramento Valley, UC Agriculture and Natural Resources

Raman Bansal - Research Entomologist, USDA Agricultural Research Service

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Carpophilus Beetle
First Detection and Initial Surveys in California

Carpophilus Beetle

Timeline of Events in CA - 2023

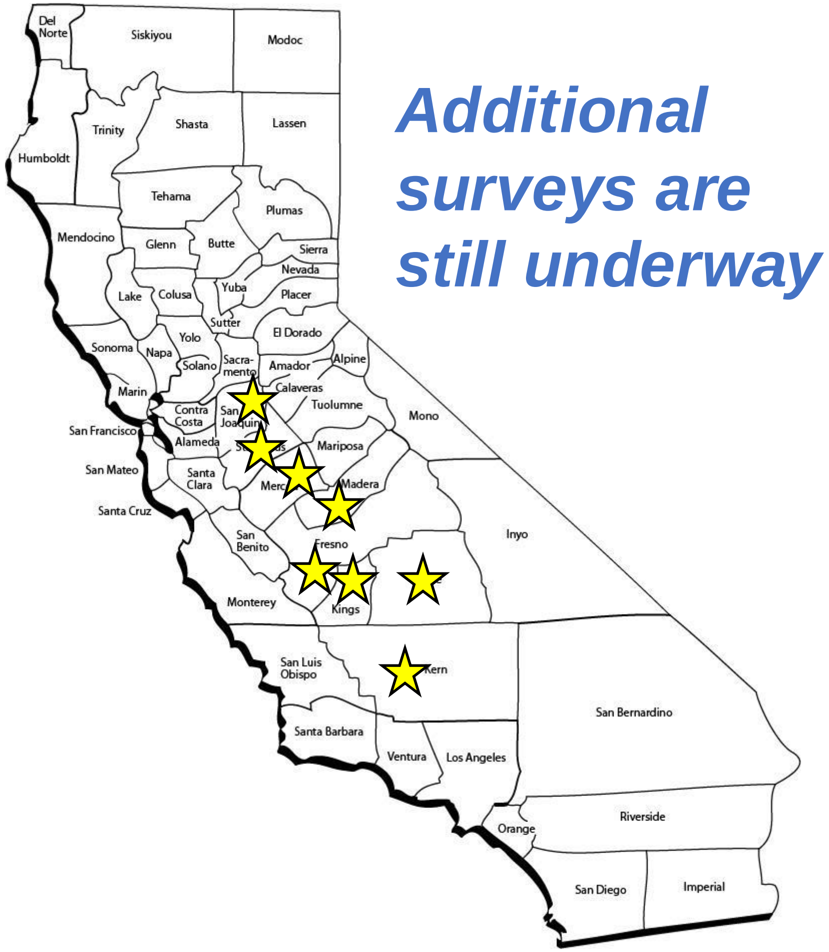
[Aug/Sept] - First Confirmed Find in Madera/Kings Counties

- **Almond – Madera Co.**
- **Pistachio – Kings Co.**

[Sept/Oct] - Launched Broader Survey

- **Current Range: Throughout San Joaquin Valley**
- **Confirmed Hosts: Almonds, Pistachios and Walnuts**





Additional surveys are still underway

Carpophilus Beetle

Timeline of Events in CA - 2023

[Oct/Nov] – Connected with Australian Researchers

- **Lots of great information on ecology and management**
- **Potential collaboration to test pheromone lures**

[Nov/Dec] – Put Together a Game Plan for 2024

- **Extension materials**
- **Proposals to CA Pistachio Research Board and Almond Board of CA**

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Carpophilus Beetle
Basic Biology and Pest Status

Carpophilus Beetle

Origins + Arrival in CA

Species/Common Names

Order: Coleoptera
Family: Nitidulidae
Species: *Carpophilus truncatus*
Common Name: Carpophilus beetle
(“car-pof-uh-lus”)

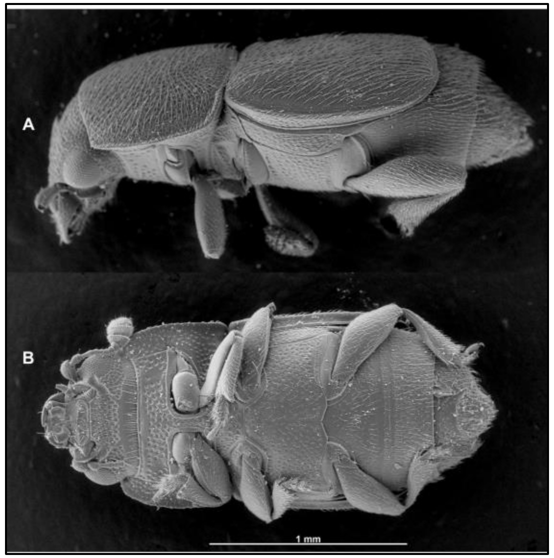


Image: Semararo et al. 2023

Geography and Origins

- >200 species of *Carpophilus* – much of their systematics remains unclear
- Center of origin is unclear – they are globally distributed

- 2010s – reported on almonds in Australia
- 2020s – reported on walnuts in Argentina and Italy
- 2023 – reported on almonds/pistachios in California

scientific reports

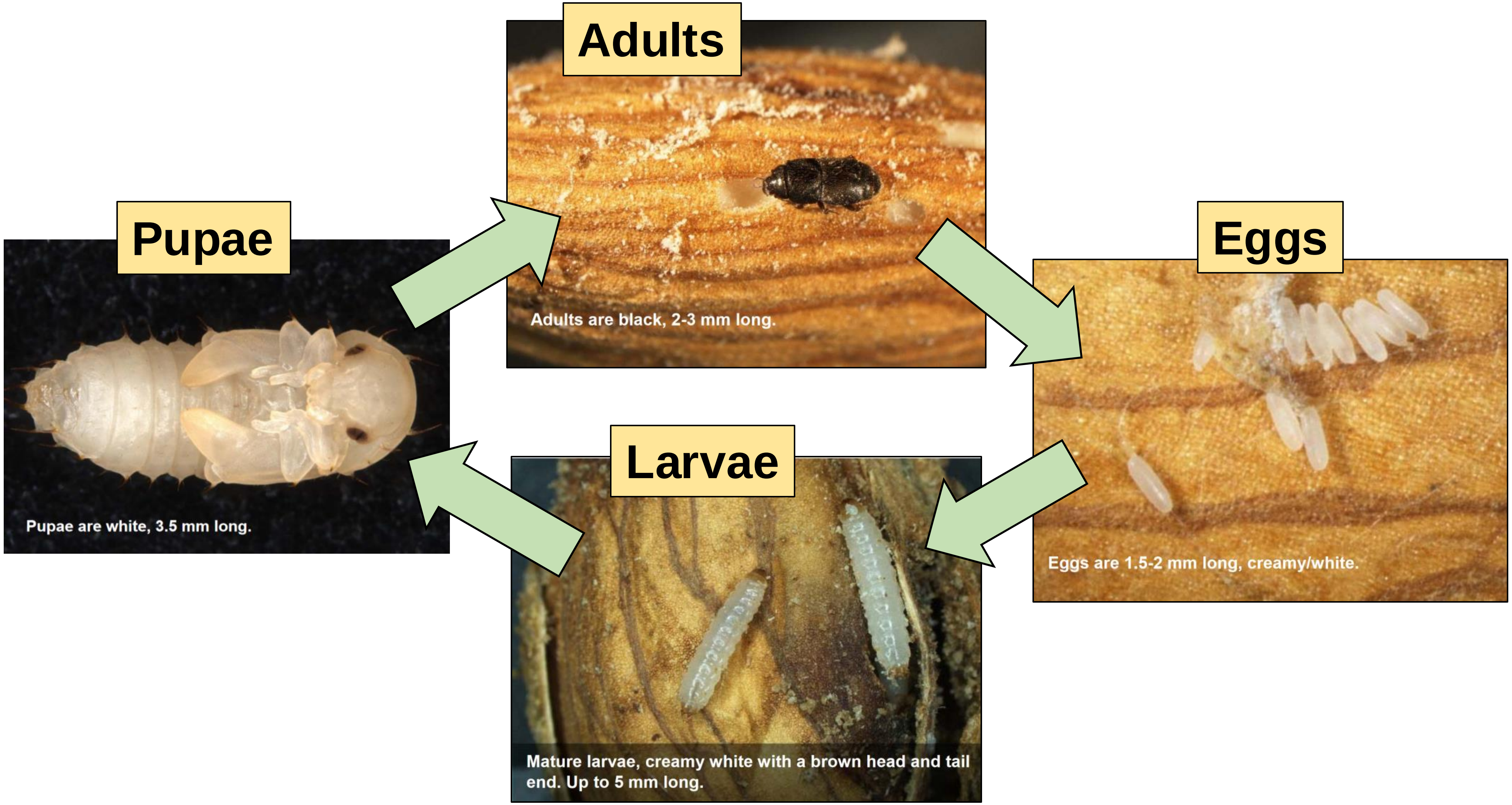
The spread of *Carpophilus truncatus* is on the razor’s edge between an outbreak and a pest invasion

Flavia de Benedetta[1,2], Simona Gargiulo[1], Fortuna Miele[1], Laura Figlioli[1], Michele Innangi[3], Paolo Audisio[4], Francesco Nugnes[1] & Umberto Bernardo[1]

https://www.nature.com/articles/s41598-022-23520-2

Carpophilus Beetle

Life Stages



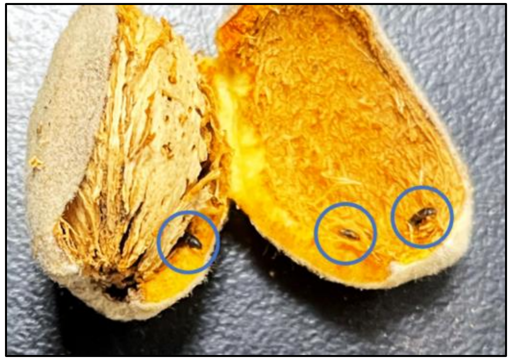
Images: Agriculture Victoria Research 2022

Carpophilus Beetle
Seasonal Phenology

Overview

- Overwinter in remnant mummy nuts
- Beetles become active on mummies in the spring
- Infest new crop nuts at hull-split
- Adults can chew through shell, then deposit eggs
- Larvae feed on the developing nuts – leaving frass and tunnels



Carpophilus Beetle

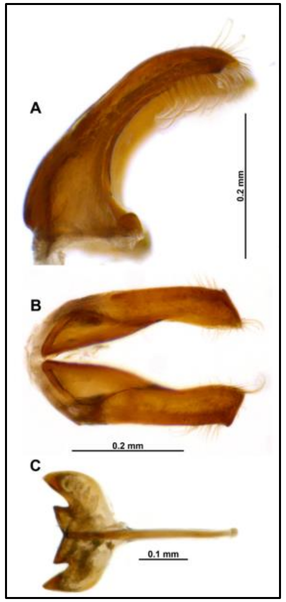
Identification is a Challenge

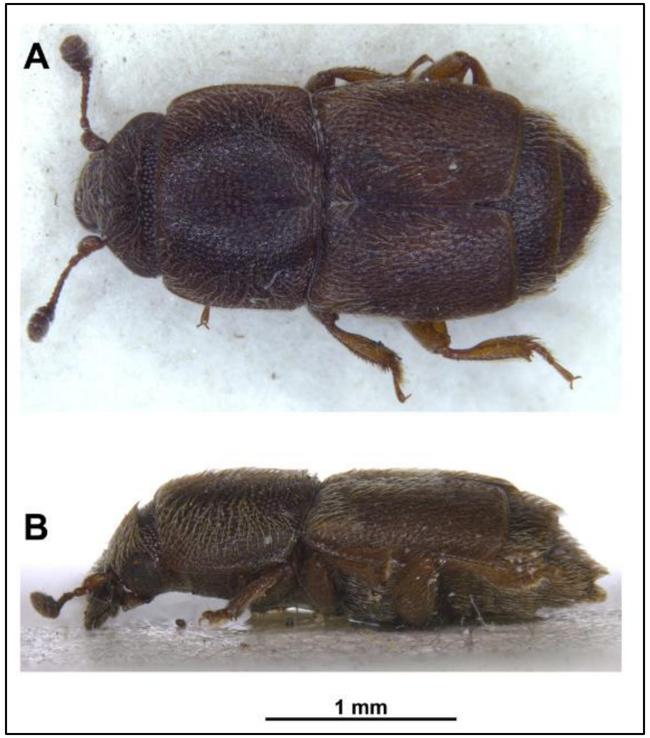
Carpophilus Beetle

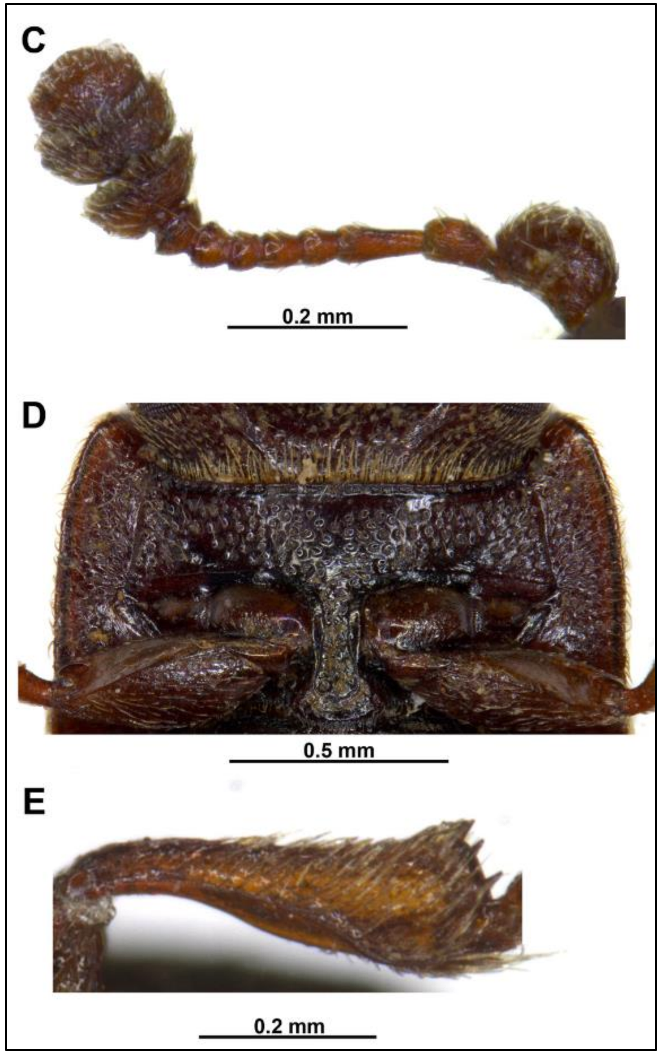
Identification is a Challenge

Adult Features

- Adult body length ranges 2.8-3.4 mm
- Morphological ID is based on male genitalia
- Clubbed antennae (not unique to this species though)
- Pitting on bottom side of thorax
- Changes in diameter of the hind leg







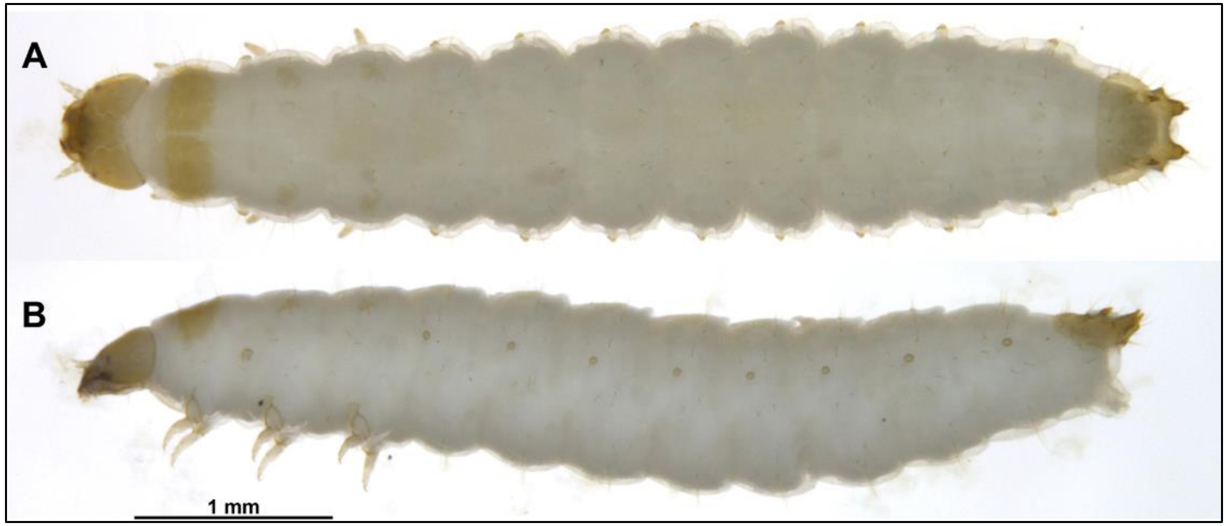
Images: Semeraro et al. 2023

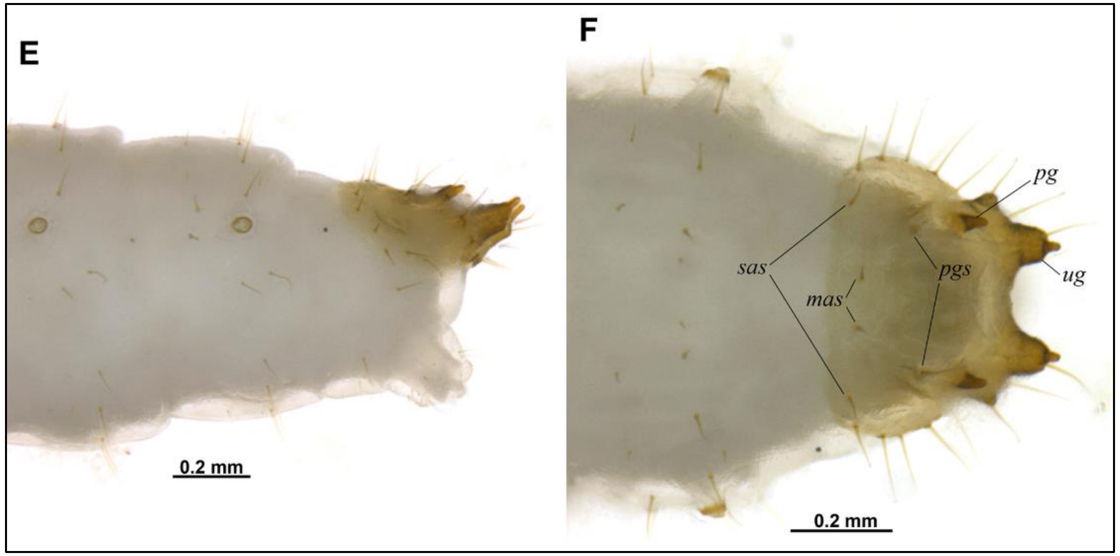
Carpophilus Beetle

Identification is a Challenge

Larval Features

- **Mature larva ranges 4.9-6.5 mm**
- **Larva is white/cream colored with light brown sclerotized head**
- **Two tail-like structure (urogomphi) at the end of the abdomen**



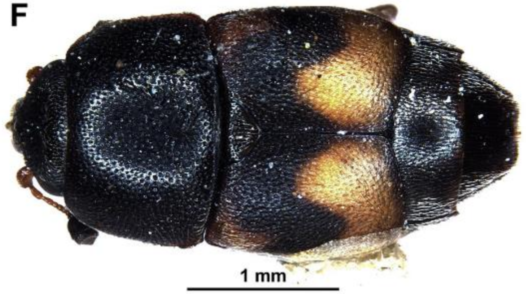


Images: Semeraro et al. 2023

Carpophilus Beetle

Other Common Species in California Orchards

Driedfruit Beetle
Carpophilus hemipterus

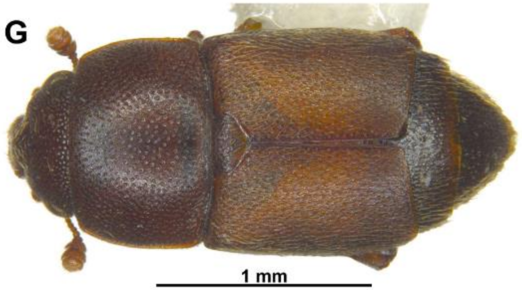


Semararo et al. 2023

UC IPM

Bugwood.org

Confused Sap Beetle
Carpophilus mutilatus



Semararo et al. 2023


U. Schmidt 2013

UC IPM

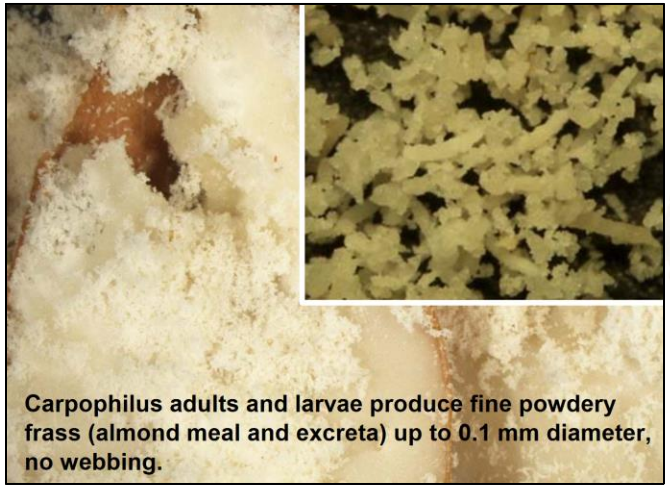
Carpophilus trunactus

Only species that feeds directly on the kernel!

Fairly distinct evidence of this damage

Produce a fine powdery frass

Carpophilus tend to consume the meat of the kernel and leave the brown skin.



Carpophilus adults and larvae produce fine powdery frass (almond meal and excreta) up to 0.1 mm diameter, no webbing.

Bugwood.org

Make oval shaped tunnels

Tunnels chewed by carpophilus larvae are often flattened in cross-section.

Entrance hole without any distinguishing external or internal features (frass, webbing, powder or insects).

UC IPM

Images: Agriculture Victoria Research 2022

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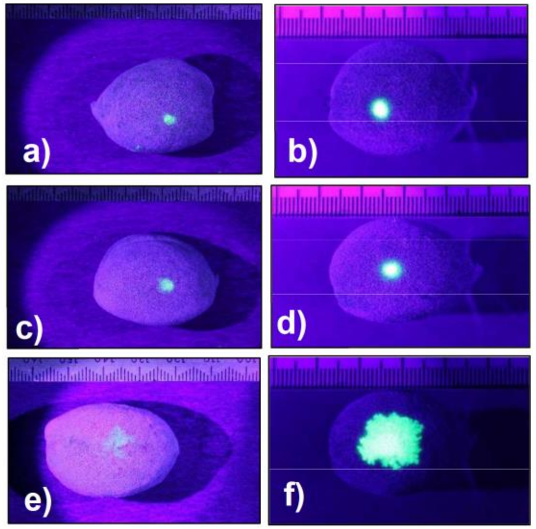
Carpophilus Beetle
Monitoring and Management

Carpophilus Beetle
Monitoring and Management

Monitoring
- **No traps or lures available yet**
- **Directly inspect remnant and new crop nuts, especially at harvest**

Management
- **Biological control is very limited**
- **Chemical controls are highly variable due to coverage challenges**
- **SANITATION is the primary approach!!**



Images: Madge 2022

Figure 2. Nuts ready for burial at 0 cm (left) and 90 cm (right).

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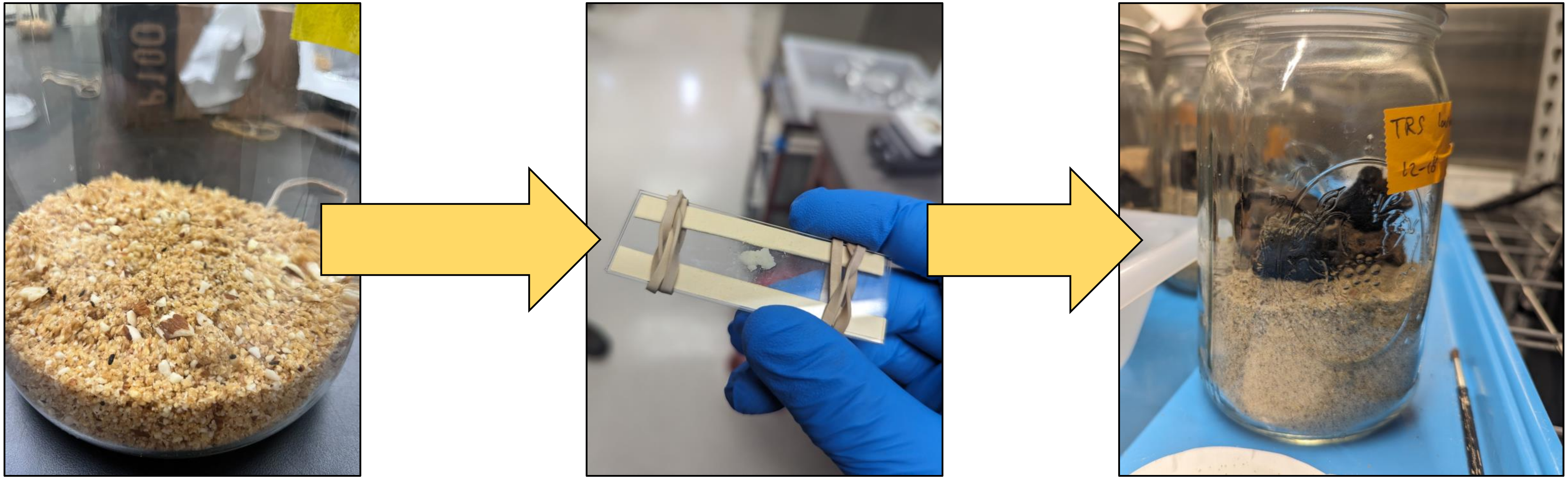
Research in California

Results from the 2024 Season

Carpophilus Beetle – Results from 2024

New Rearing Methods

Allows increased production for lab/field assays



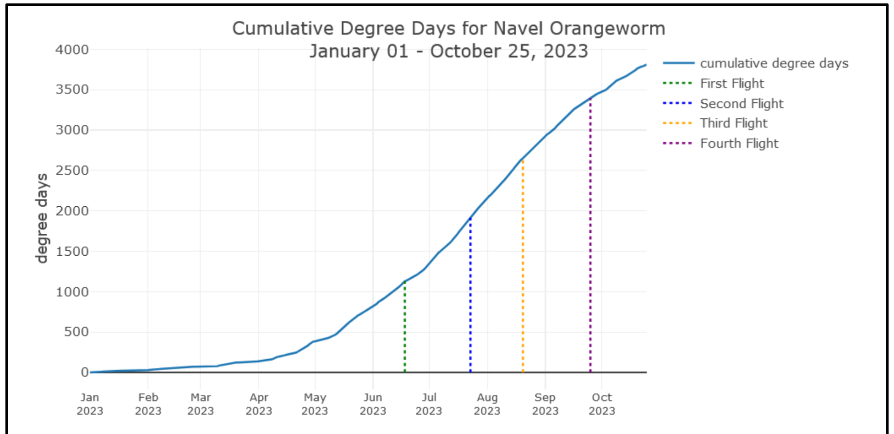
New egg deposition and rearing medium

Carpophilus Beetle – Results from 2024

Characterizing Developmental Biology

Allows us to develop phenology models and predict activity

- *How many degree-days does it require to complete development?*
- *What are the lower and upper temperature thresholds?*



Notes

- Degree days are computed using the sng_sine method with a horizontal cutoff, a lower threshold of 55°F, and an upper threshold of 94°F.

Phenology Events

event	dd	date	cumulative.dd
First Flight	1121.4	2023-06-18	1129
Second Flight	765.9	2023-07-23	1917
Third Flight	750	2023-08-20	2651
Fourth Flight	750	2023-09-25	3396

Carpophilus Beetle – Results from 2024

Spring Emergence Timing & Movement to New Crop

When do they become active? When is the crop vulnerable?

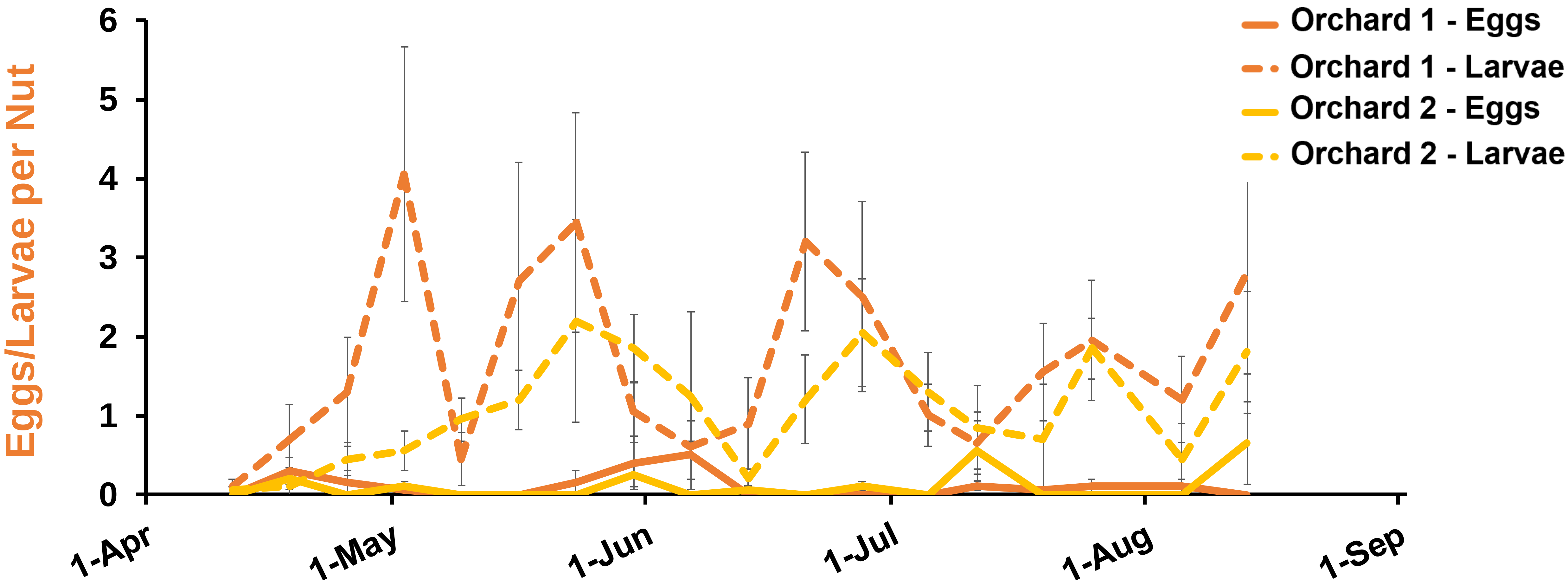
- *Cohorts of remnant mummy nuts placed into emergence cages*
- *Cages checked weekly for carpophilus beetle activity*

Photos: Mahesh Ghimire & Jhalendra Rijal (UC IPM)

Carpophilus Beetle – Results from 2024

Spring Emergence Timing & Movement to New Crop

Active in spring, reproducing on remnant mummy nuts

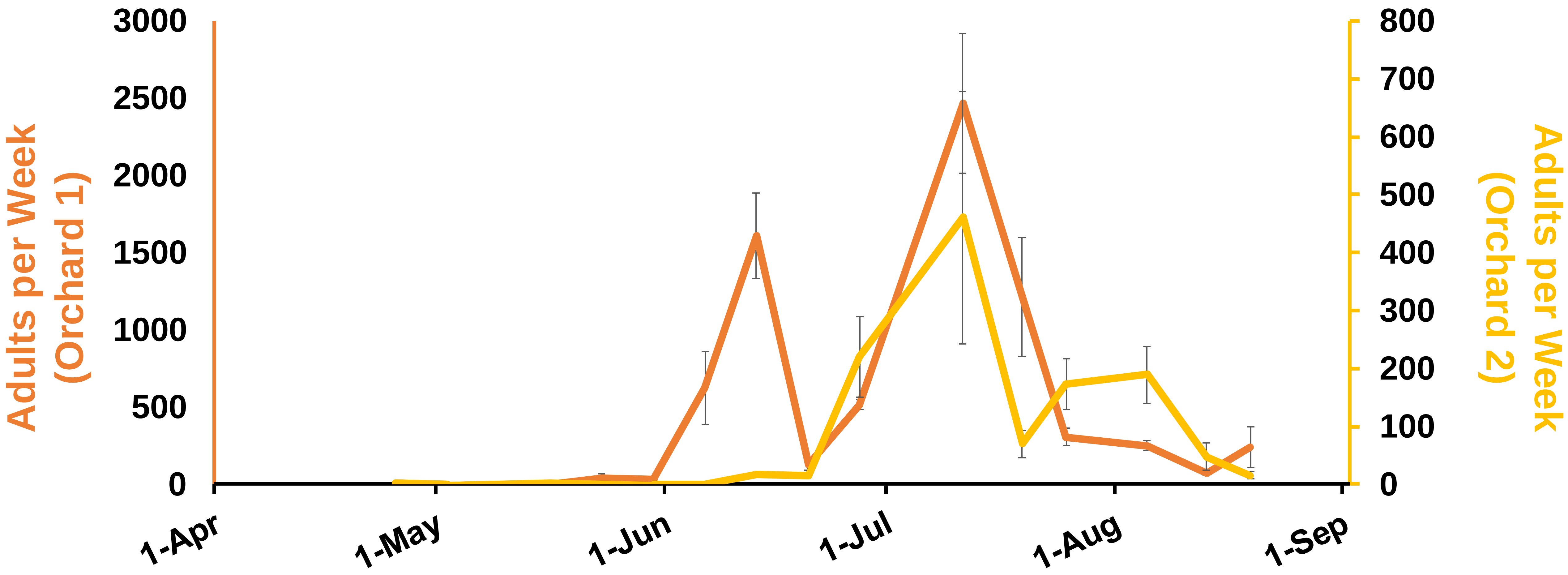


Figures: Mahesh Ghimire & Jhalendra Rijal (UC IPM)

Carpophilus Beetle – Results from 2024

Spring Emergence Timing & Movement to New Crop

Movement towards new crop nuts as hull-split approaches



Figures: Mahesh Ghimire & Jhalendra Rijal (UC IPM)

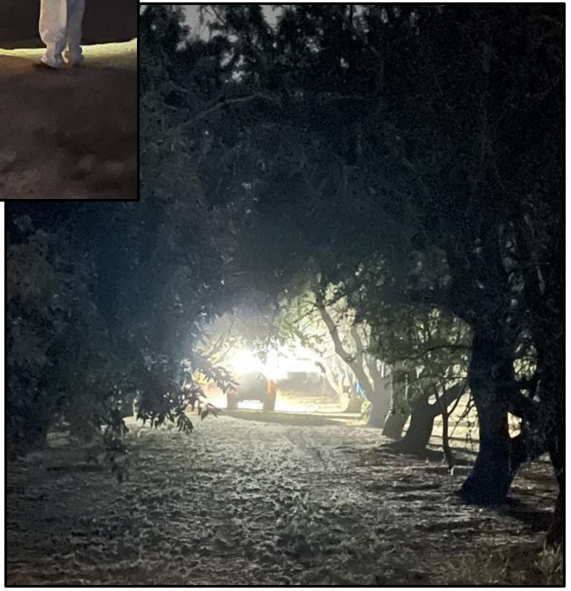
Carpophilus Beetle – Results from 2024

Evaluated Chemical Controls at Hull-Split

Very limited product efficacy – more tests to come…

Active Ingredients Evaluated (2024)

- **Acetamiprid**
- **Bifenthrin**
- **Chlorantraniliprole**
- **Chlorantraniliprole + Lambda-cyhalothrin**
- **Clothiandin**
- **Cyantraniliprole**
- **Methoxyfenozide + Spinetoram**
- **Spinetoram**
- **Spinosad**
- **Untreated Control**



Photos: Mahesh Ghimire & Jhalendra Rijal (UC IPM)

Carpophilus Beetle – Results from 2024

Measured Canopy Damage

Preliminary results - more infestation in lower canopy

Reva Scheibner (Wilson Lab) collecting nuts from the upper, middle and lower canopy

Carpophilus Beetle – Results from 2024

Evaluated New Pheromone Lures

They attract A LOT of carpophilus beetles

Bucket trap placed at ground level with pheromone and co-attractant

1,000s of carpophilus beetles captured

Carpophilus Beetle – Results from 2024

Extension and Outreach

Field Days, Webinar, Radio, Industry Journals, Damage Guide

Dozens of Talks Across the State

Webinar with Research and Industry in Australia

https://youtu.be/Ybduf-jm3mQ

New Pest ID Guide

http://www.sacvalleyorchards.com/wp-content/uploads/2024/08/Carpophilus-Flyer-med.pdf

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Research in California
Plans for the 2025 Season

Carpophilus Beetle – Plans for 2025

Research and Extension

Focus on developing monitoring and management strategies

Key Activities

- Developmental Biology
- Seasonal Phenology
- Movement onto New Crop Nuts
- New Chemical Controls
- Pheromone Lure Longevity and Trapping Radius
- Influence of Soil on Pupation Success
- Extension and Outreach

Thank You! Questions?

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[Cooperators] Idong Mokwunye (UC IPM)

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Numerous growers and pest control advisors (PCAs) who helped us collect samples and identify infested field sites.


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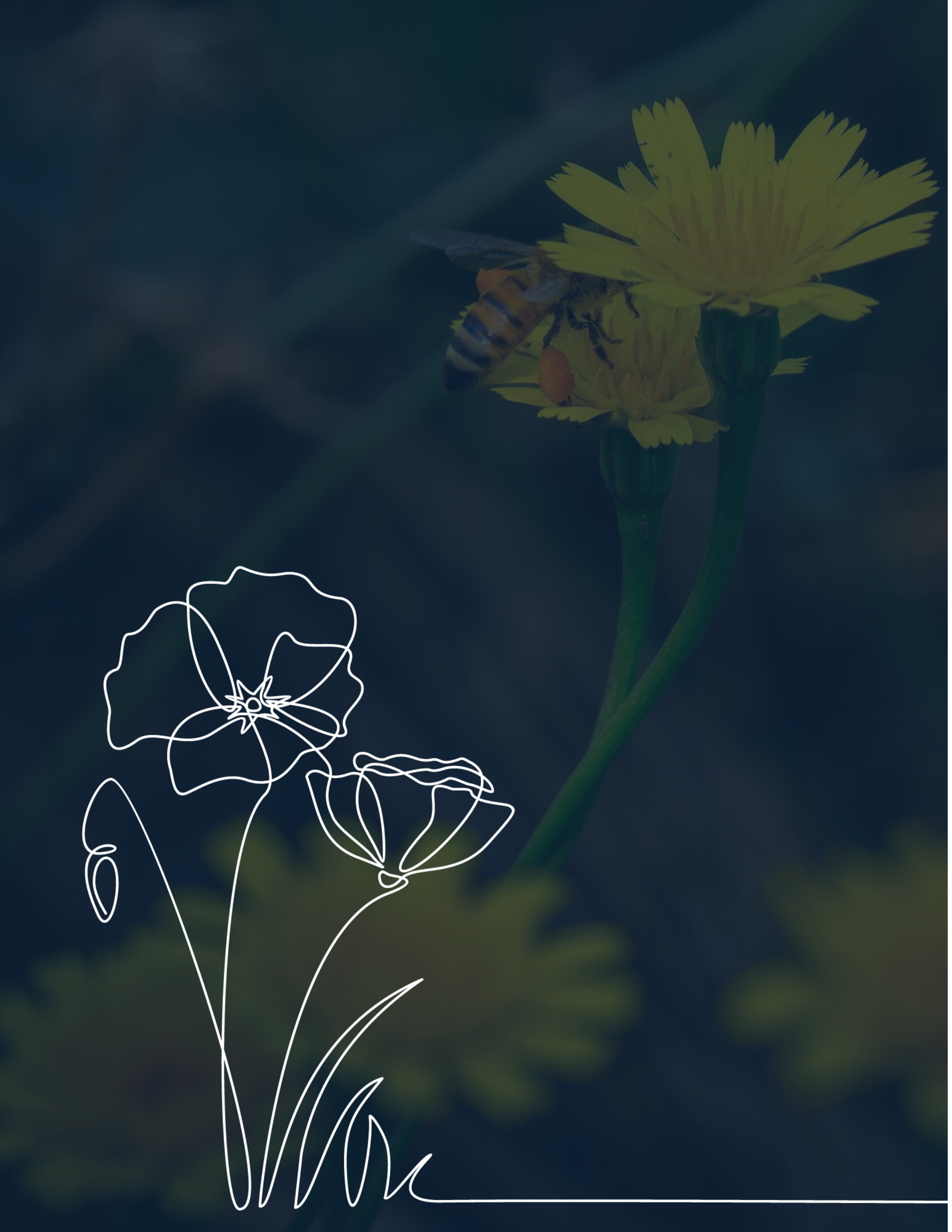
Pest Prevention in California

Joshua Kress

Plant Health and Pest Prevention Services

CDFA CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE



Pest Prevention in California

Overview

County, State, and Federal agencies work collaboratively to prevent the introduction of invasive plant pests and diseases and protect California's (and the nation's) food supply, environment and natural resources, and public health

The California Department of Food and Agriculture (CDFA) leads this effort in California through its Pest Prevention System, which includes:

- **EXCLUSION**: external and internal exclusion activities designed to prevent pest introduction and respond in a timely manner to contain the spread of newly detected pests
- **DETECTION**: early detection of plant pests before they become well established
- **ERADICATION**: timely and effective eradication actions to eliminate new pest infestations
- **CONTROL**: control and containment systems for plant pests that have become established
- **IDENTIFICATION**: accurate and timely identification
- **PUBLIC OUTREACH**: enlist public support of pest prevention activities through enhanced public awareness and education
- **SCIENTIFIC SUPPORT**: research, information technology, and pest risk analysis systems to ensure that the Pest Prevention System is relevant, scientifically based, and continuously improved

Pest Prevention in California

Rules for Importation - Federal

Importation of *Prunus, Malus*, *Pyrus*, and *Cydonia* into the United States is prohibited from all countries, except:

- Articles may be imported from Canada under phytosanitary certificate and are generally admissible
- Articles from some specified countries may be imported under Postentry Quarantine (PEQ)
  - In PEQ, plants are maintained under specified conditions and remain on hold for a specified timeframe
  - While on hold, plants are inspected by county, state, and/or federal agricultural inspectors for pests and pathogens
  - If all inspections are negative, the plants are released into U.S. commerce
- Articles from all other countries may be imported under a Controlled Import Permit (CIP)
  - In CIP, plants are imported into a USDA-approved facility (usually a Clean Plant Center)
  - Typically, the material goes through therapy and is grown for a minimum of two growing seasons
  - Subject to both testing and inspections, including HTS

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Pest Prevention in California

Rules for Importation - State

- No specific restrictions for interstate movement of harvested almonds or of *Prunus* nursery stock and propagative materials coming into California.
- Many state exterior quarantines include general restrictions for nursery stock entering California from regulated states. Examples include:
  - Burrowing and reniform nematodes – 3 CCR § 3271
  - Japanese beetle (JB), *Popillia japonica* – 3 CCR § 3280
  - Spotted lanternfly (SLF), *Lycorma delicatula* – 3 CCR § 3287
- Additionally, all plants and plant products must meet general pest cleanliness standards and be free of prohibited pests for entry into California.
  - All shipments of plants, plant products, and other hosts of plant pests and/or pathogens, including conveyances, are inspected at California's Border Protection Stations by CDFA inspectors
  - Shipments that include regulated commodities are placed under a hold, pending inspection and/or release at destination by the county agricultural commissioner
- For questions on California entry requirements for any plants or plant products, contact CDFA's Interior Pest Exclusion Program at: peinfo@cdfa.ca.gov

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Pest Prevention in California

Regulatory Responses to Pest Detections

California Food and Agricultural Code (FAC) Section 5301 authorizes CDFA to establish quarantines within the State to prevent the spread and establishment of plant pests that have been introduced into California.

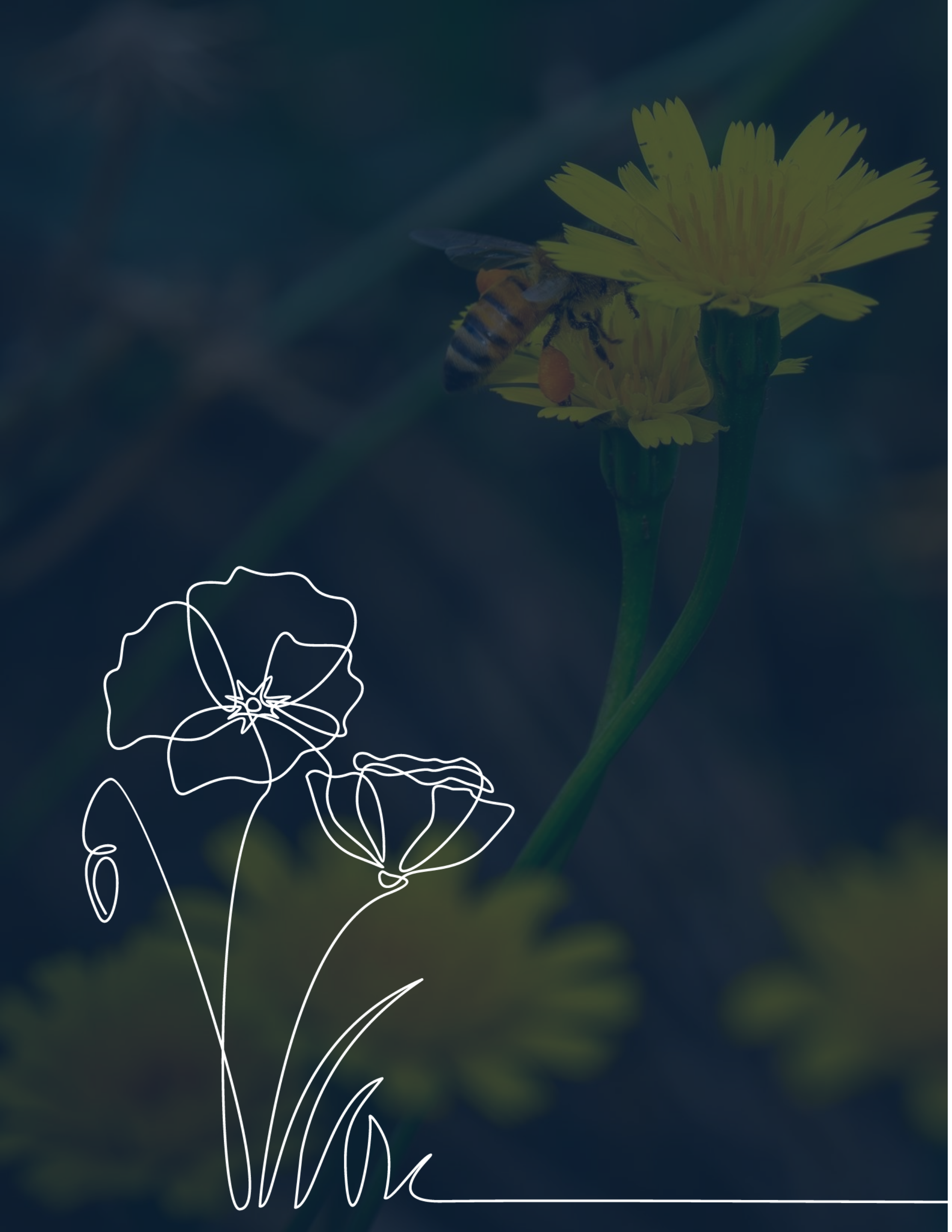
Current State Interior Quarantines include:

- Mediterranean fruit fly (Medfly), *Ceratitis capitata* – 3 CCR § 3406
- Sweet orange scab (SOS), *Elsinoë australis* – 3 CCR § 3443

In addition to the establishment of quarantine and eradication programs, CDFA also has an action-oriented pest rating system (3 CCR § 3162) that is used to analyze new pests and take appropriate enforcement action to protect California's agricultural and natural resources:

- A-rating: pests of agriculture or environment with a high consequence of introduction that are or may be placed under official control in California, or are not known to occur in California
- B-rating: pests with a medium to high consequence of introduction and are of limited distribution in California
- C-rating: pests with a low consequence of introduction and/or are of common occurrence and generally distributed in California
- D-rating: organisms with a low consequence of introduction and are known to be beneficial or to cause no harm to agriculture or the environment
- Q-rating: pests expected to have a high consequence of introduction for which a pest rating has not yet been proposed/final ("temporary A-rating")

Pest rating proposals are posted for public comment. Additionally, any interested party can submit a pest rating proposal for consideration and public comment. Instructions on the pest rating process, current and proposed pest ratings, and additional information are available on CDFA's website: https://blogs.cdfa.ca.gov/Section3162/.



Pest Prevention in California

Looking Forward – C3PA

CDFA and the County Agricultural Commissioners are currently funding a study on pest prevention efforts in California called the Comprehensive Pest Prevention Program Analysis (C3PA).

The first large-scale analysis of California's Pest Prevention System since 1997, the foundational goals of C3PA are:

- Identify what strategies and tools are needed to support a modern pest prevention system
- Evaluate the effectiveness of pest risk abatement from new pathways and evaluate current pest exclusion strategies
- Quantify necessary funding needed to support all aspects of an effective and dynamic program

Pest Prevention in California

Looking Forward – C3PA

C3PA has four research focus areas:

1. Impacts of invasive plant pest species introductions and required prevention strategies
2. New business practices which pose invasive pest risks
3. New crops and management practices which pose invasive pest risks
4. Early detection strategies, with emphasis on how and where these strategies can be used in pest detection activities

Led by the UC Davis Quantitative Biology and Epidemiology (QBE) Lab and the CSU Agricultural Research Institute (ARI), the study includes collaborators from:

- University of California, Davis
- UC Agriculture and Natural Resources
- University of Florida
- Cal Poly San Luis Obispo
- Cal Poly Pomona
- Cal Poly Humboldt
- Sacramento State University
- CDFA Office of Pesticide Consultation and Analysis

Pest Prevention in California

Resources

CDFA Pest Exclusion Branch

https://www.cdfa.ca.gov/plant/PE/

916-654-0312

peinfo@cdfa.ca.gov

USDA APHIS Plant Protection and Quarantine

https://www.aphis.usda.gov/plant-protection-quarantine/about

USDA Trade Information

https://www.aphis.usda.gov/contact/trade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