



2017

# THE ALMOND CONFERENCE

ABC PARTNERS ADDRESSING BEE HEALTH

Room 312-313 | December 7 2017



# CEUs – New Process

## Certified Crop Advisor (CCA)

- Sign in and out of each session you attend.
- Pickup verification sheet at conclusion of each session.
- *Repeat this process for each session, and each day you wish to receive credits.*

## Pest Control Advisor (PCA), Qualified Applicator (QA), Private Applicator (PA)

- Pickup scantron at the start of the day at first session you attend; complete form.
- Sign in and out of each session you attend.
- Pickup verification sheet at conclusion of each session.
- Turn in your scantron at the end of the day at the last session you attend.

*Sign in sheets and verification sheets are located at the back of each session room.*

# AGENDA

- **Gabriele Ludwig**, Almond Board of California, moderator
- **Danielle Downey**, Project Apis m.
- **Stacey Smith**, The Keystone Center
- **Val Dolcini**, Pollinator Partnership



# PROJECT APIS M. YOUR PARTNER SUPPORTING BEE HEALTH

Danielle Downey

Executive Director, Project Apis m.

[Danielle@projectapism.org](mailto:Danielle@projectapism.org)

Almond Board Conference, 2017



Project Apis m.

# TALK OUTLINE

- PAm's roots: Almonds and Bees
- New Initiatives: research
- Working together, building more partnerships
- Forage Projects:
  - Seeds for Bees
  - Bee & Butterfly Habitat Fund

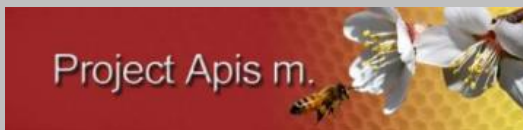


Project Apis m.



# Project Apis m. Mission Statement

Project Apis m.'s mission is *to fund and direct research to enhance the health and vitality of honey bee colonies while improving crop production.*



# PAM: NEARLY \$7 MILLION INVESTED IN 10 YEARS!

<https://www.projectapism.org>

## Project Apis m.

— [HOME](#) [ABOUT US](#) [NEWS & EVENTS](#) [HONEY BEE RESEARCH](#) [FORAGE](#) [RESOURCES](#) [VIDEO](#)

PAm Directed Honey Bee Research (Home)

Request Funding

Honey Bee Health Research

Nutrition and Forage Research

Honey Bee Helps

Long Term Stock Improvement Research

Pollination and Almonds Research

Grant Funded Project Apis m. Projects

Enhancing the Health



# WHERE DOES PAM GET FUNDING?

- Beekeepers
- Growers of pollinated crops
- Corporate Sponsors
- Grants

## PAm Leadership

Dan Cummings

Pat Heitkam

Lyle Johnston

Brent Barkman

Joe Traynor

Zac Browning

Joe MacIvaine

John Miller

Steve Park

Gordon Wardell

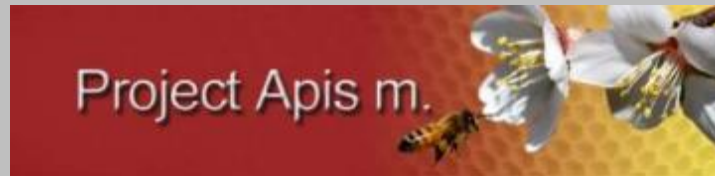
Gene Brandi

Dave Mendes

Christi Heintz

Doug Hauke

Gary Shilling





# PAm: a unique position, for lasting impact.

## Trusted Reputation

We are the go-to organization in honey bee health research, with an unmatched breadth and depth of experience. We are lean, efficient, and have built connections that create impact.

## Expertise

The core of our mission is research and biology-supported forage programs. We are the nexus of all stakeholders – beekeepers, growers, researchers, landowners, ag industry, consumers, retailers.

## Relevance

Our work has many beneficiaries from honeybees and other wildlife to soil and water quality and a wide spectrum of diverse stakeholders.

# NEW INITIATIVES, NEW PARTNERS- PAM IS GROWING



COVER STORY 33

## Hive and seek

The search for answers in the face of a bee crisis.

BY STEPHANIE E. PONDER

*Project Apis m. executive director Danielle Downey inspects a honeybee hive.*

“PAM stood out as a clear front-runner,” says Lopez, who adds that PAM already had deep connections within the industry, along with an international scope, and was already set up to fund research projects.

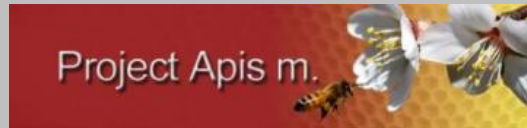
- Costco USA
- Costco Canada
- Healthy Hives 2020, Bayer
- National Honey Board

Project Apis m.



# BEES & ALMONDS: SUSTAINABILITY IS KEY!

- PAm has multiple, practical approaches to bee health
- Research on Honey Bee Health to find better solutions
  - Pests, Pathogens, Parasites, Pesticides, Pasture
- Bees & Almonds: We need each other!
  - Colony losses are still high, bee health is a risk for all
  - Our partnership is key for a healthy industry
  - Tank mix research (Johnson) -> BMP example
- As demand grows, we (beekeepers and growers) must make the system more sustainable to ensure success.
  - PAm approaches: research & forage



# BEES FACE MANY COMPLEX PROBLEMS.

1. Varroa mite- Honey Bee Enemy #1!
2. Pathogens
  - Virus, gut parasites, bacteria, fungus
3. Pesticides
4. Environmental stress
  - Nutrition
  - Habitat/forage loss

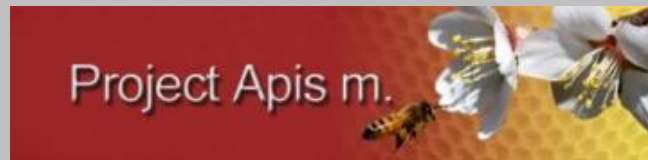


Project Apis m.



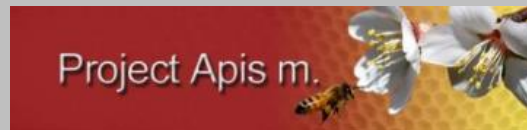
# WE CAN MITIGATE THOSE PROBLEMS.

1. Varroa mite- Honey Bee Enemy #1!
  2. Pathogens
    - Virus, gut parasites, bacteria, fungus
  3. Pesticides
  4. **Environmental stress**
    - **Nutrition**
    - **Habitat/forage loss**
- } mitigation



# IN ADDITION TO RESEARCH FOCUS, PAM PUT \$1 MILLION INTO FORAGE PROJECTS

- Sustain bee health by investing in a landscape that supports them.
- Mitigate bee stressors, improve productivity for beekeepers and growers.
  - Better nutrition makes better pollinators
- Significant resource management benefits in almond orchards
  - Soil improvements: nitrogen, organic matter, compaction, drainage, retention
  - Water retention and conservation
  - Air quality, dust mitigation
- BIG tent with new partners: what honey bees need is also what butterflies, native pollinators, birds & wildlife need.

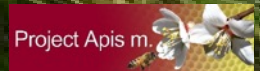
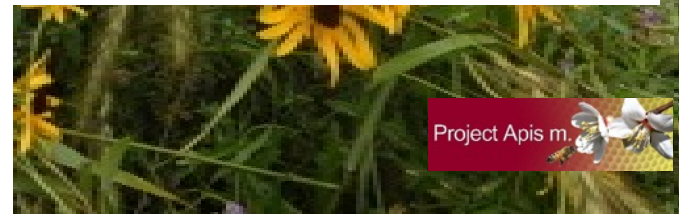


# Strategic solutions where honey bees benefit most.

In the almond orchards of California, bees need food before and after almond bloom.

And, after the busy pollination season, bees summer in the upper Midwest. Here, they replenish and (hopefully!) make honey.

Bee and Butterfly  
Habitat Fund



# Seeds for Bees

**Billy Synk**

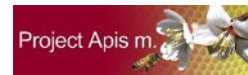
Working with California growers and beekeepers, we provide free seed mixes maximized for honeybee nutrition & orchard benefits. We offer planting guidance and best practice resources.

**A win-win for honey bees,  
beekeepers, growers, and soil and  
water quality.**



**6,000**

acres of pollinator habitat  
planted last year



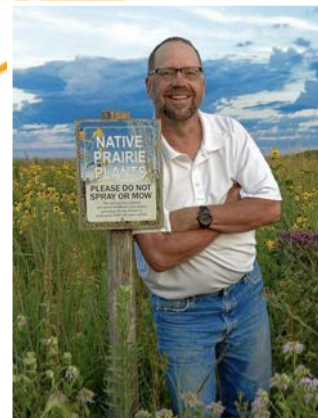


# Bee and Butterfly Habitat Fund

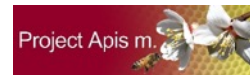
**Pete Berthelsen**

We support beekeepers and landowners, to plant habitat in agricultural landscapes that no longer support healthy bees in the Upper Midwest. Honey bees benefit, and so do Monarch butterflies, native pollinators, song birds, game birds and wildlife.

These plantings also also benefit soil, air and water quality management.



Did you know?  
About 75% of the bees that pollinate crops spend the summer in 8 states.





# The Bee & Butterfly Habitat Fund

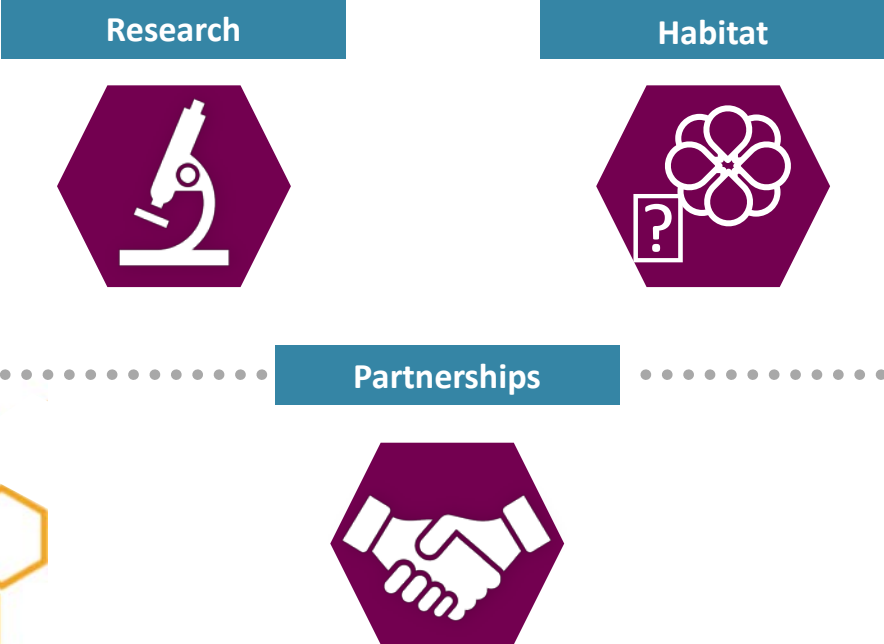
*A Unique Conservation Solution.*

- 15** acres average per landowner
- 6** year average contract
- 124** participants & waiting list
- 7** million milkweed seeds planted



## #NOWASTEDLAND

# Collaboration the foundation of our efforts, and the path to ensure success.



“ I suggest supporting organizations that understand the crisis. Project Apis m. stood out as a front-runner. ”

*Shauna Lopez,  
Corporate Foods  
Buyer Costco*



# **WATCH PROJECT APIS M. VIDEOS**

**VISIT OUR TABLE IN POSTER  
AREA IN EXHIBIT HALL A+B**

**Seeds for Bees**

**<https://youtu.be/KrVLGFI4I3c>**

**Bee & Butterfly Habitat Fund**

**5 min: <https://youtu.be/rkRPSSyiNhl>**

**10 min:**

**<https://youtu.be/WA2mfitKmok>**



# HONEY BEE HEALTH COALITION

HEALTHY BEES, HEALTHY PEOPLE, HEALTHY PLANET.™



**HONEY BEE  
HEALTH  
COALITION**

A diverse, collaborative,  
private-public partnership  
addressing the multiple factors  
impacting honey bees

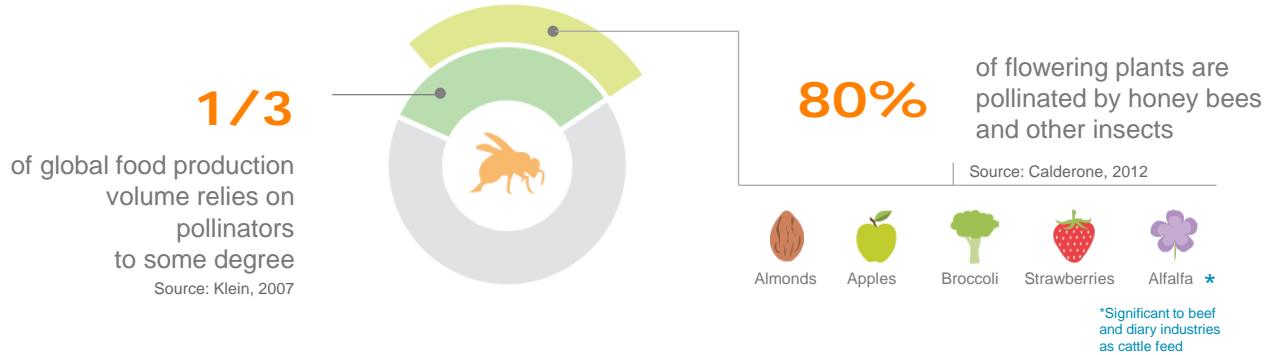
# WHY the Honey Bee Health Coalition?



# THE WORLD RELIES ON THE HONEY BEE

Honey Bees Are a Key Component to Sustainable Agriculture, Healthy Diets, the Global Food Supply, and the Economy

## A Healthy Diet



## U.S. Agriculture

**\$ ~ 18** Billion Per year

The amount of dollars of U.S. agricultural production supported by honey bee pollination

Source: USDA

## Canadian Agriculture

**\$ ~ 4 Billion**

The annual value of honey bee pollination in Canada.

Source: Agriculture and Agri-Food Canada

👏 **The future security of America's food supply depends on healthy honey bees** Tom Vilsack, Agriculture Secretary





# THE CURRENT CHALLENGE

## Factors that Pose a Challenge for Honey Bee Health

### The Challenge



APPROX. **29%**

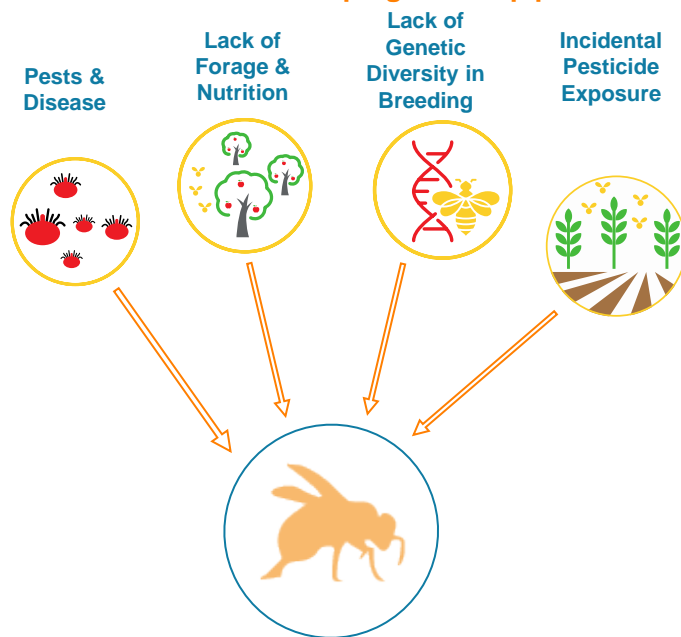
Of honey bee population lost each winter, compared to 10-15% historically

Agriculture, healthy lifestyles, and worldwide food security **depend on honey bee health**. U.S. overwintering losses for managed honey bees between 2006 and 2015 ranged from approximately 23-36%, compared to a historical rate of overwintering losses of 10-15%.\*

\*Source: Survey data generated by USDA

### Stress Factors

Impacts on bee health have been linked to a variety of factors, including those influenced by the activities associated with both **beekeeping and crop production**.



### MANY STAKEHOLDERS, ONE AGRICULTURE



# HONEY BEE HEALTH COALITION MISSION

Collaboratively implement solutions that will help to achieve a **healthy population of honey bees** while also supporting healthy populations of native and managed pollinators in the context of **productive agricultural systems** and **thriving ecosystems**.



# HONEY BEE HEALTH COALITION: Many Stakeholders, One Agriculture



## WHAT IS THE COALITION?

A collaborative, science-based, cross-sector effort to improve the health of honey bees.

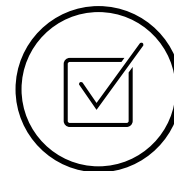
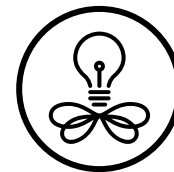
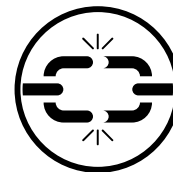
### Principles

Cross-sector, collaborative

Recognizes multi-factorial problems

Outcome and solution-oriented

Science-based



**WHAT**  
is the Coalition doing?



# BEE HEALTHY ROADMAP



Shares the Coalition's mission, vision, and strategic goals

Identifies **4 top priorities** that need collective action and collaboration

[www.honeybeehealthcoalition.org](http://www.honeybeehealthcoalition.org)

# HONEY BEE HEALTH COALITION PRIORITIES

**The Coalition is focusing** on accelerating collective impact to improve honey bee health in four key areas.



## **Nutrition & Forage**

Ensure honey bees – especially those in and around production agriculture – have access to a varied and nutritious diet.



## **Hive Management**

Put the best available tools, techniques, and technologies in the hands of beekeepers so they can better manage their hives.



## **Crop Pest Management**

Control crop pests while safeguarding pollinator health.



## **Outreach, Education and Collaboration**

Work together to improve honey bee health; develop outreach materials; and develop future research and demonstration projects.



# OVERVIEW OF ACHIEVEMENTS

Recent deliverables



## Varroacide Screening

### VARROA MANAGEMENT RESOURCES



Check out our practical tools for combatting Varroa mite!

- Techniques include:**
- ✓ Rigorous monitoring of Varroa mite populations.
  - ✓ Practices to deter mite population build-up.
  - ✓ Rotation of products that consider mite/bee population dynamics and minimize potential development of mite resistance.



### VARROA VIDEOS

The following videos demonstrate techniques for combatting Varroa mites



### BEE HEALTHY ROADMAP

IMPROVING HONEY BEE HEALTH

HEALTHY BEES • HEALTHY PEOPLE • HEALTHY PLANET™



HONEY BEE HEALTH COALITION™

March 16, 2015

To: Pollinator Health Task Force and US Honey Bee Health Coalition  
 From: Recommendations regarding actions and habitat for honey bees and other conservation programs, public-private

On February 10, 2015, the Honey Bee Health Coalition, the Pollinator Health Task Force (Task Force) and US

### Quick Guide to Reporting a Pesticide-Related Bee Kill Incident

1. First contact your state lead pesticide agency to begin in of state lead agency contact information is provided on a you should still collect information and file a report with E
2. Take photos/video of honey bees and incident area; rec: as possible on conditions surrounding the loss.
3. Consider collecting your own evidence for lab analysis (i or blooms from plant on which bees are foraging). For de

### THE GROWER'S ROLE ENSURING HONEY BEE HEALTH ON WORKING AGRICULTURAL LANDS

Proactive communication between growers, applicators and beekeepers is essential to protect honey bees from unintended pesticide exposure. Beekeeper and landowner it is important to pollinators.



### MP3 Symposium Agenda

March 10-11, 2016

USDA Federal Building "Patriot Plaza III"

Best management practices (BMPs) to protect honey bees and other pollinators in soybeans

Authored by: Adam G. Dolezal; Honey bee health coalition technical committee

Title suggestions welcome:

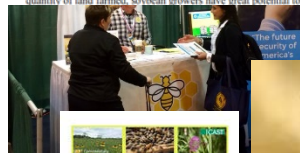
- "Helping Soybeans and Honeybees Grow Together"
- "Optimizing the (Honey)Bee Environment in Soybeans"
- "How can soybean production impact America's bees?"

Soybeans are the world's top-produced oilseed crop. Soybeans were produced on about 84 million acres across the eastern two thirds of the USA in 2015 and 2016. With such a large quantity of land farmers have been growing, it is important to impact America's pollinators.



Beekeeper Insights on Honey Bee Nutrition Supplements

Summary Report of Beekeeper Interviews  
 April 2017



How do we feed the planet while protecting honey bee health?

# FORAGE AND NUTRITION

**Goal:** Ensure honey bees – especially **in and around production agriculture** – have access to a **varied and nutritious diet** throughout their lives

**Activities:**

- Providing recommendations to improve and increase forage in **USDA conservation programs**
- Engaged in **demonstration projects** to get forage on the ground
- Conducted beekeeper interviews to identify recommendations for **nutrition supplement research and development**
- Launched a **Nutrition Prize competition** to support innovation in the field



# HIVE MANAGEMENT

**Goal:** Put the **best available tools, techniques, and technologies** in the hands of beekeepers so they can **better manage their hives**

**Activities:**

- Developed a **guide to Varroa control methods** and accompanying **educational videos, and bee club PowerPoint presentation**
- Research and testing into **new varroacides**
- Support of **Bee Informed Partnership's Tech Transfer Teams**



# CROP PEST CONTROL

**Goal:** Control crop pests and safeguard pollinator health

**Activities**

- Developing BMPs for Soybean growers that protect pollinators
- Developing pollinator-focused continuing education module for crop pest consultants and advisors
- Supporting State MP3 conversations by convening a national symposium
- Developed an incident reporting guide for incidental pesticide exposure



# Outreach, Education, and Collaboration

**Goal:** Work together to **improve honey bee health**, develop **outreach materials**; and develop **future research** and **demonstration projects**.

**Activities:**

- Proposed and funded the newly released CAST paper for federal policy makers, “**Why Does Bee Health Matter and What We can Do about It**”
- Promoting **public-private education, communications, outreach, and collaboration** across diverse stakeholders, through **experiential learning** and other platforms
- Develop **outreach materials** and **opportunities**



# Bee Integrated Demonstration Project



Pair

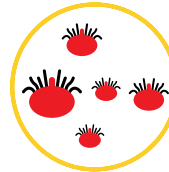
Support

Measure

Share

## IN SUMMARY

- A **Collaborative network of** diverse, private and public sector stakeholders to unpack these **complex issues** and find solutions to honey bee health
- The Honey Bee Health Coalition is engaging **a variety of public-private partners** throughout **agriculture, research, government, and conservation** to promote **multi-factor solutions** for honey bee health.



## MORE INFORMATION

[www.honeybeehealthcoalition.org](http://www.honeybeehealthcoalition.org)

[ssmith@keystone.org](mailto:ssmith@keystone.org)



**HONEY BEE  
HEALTH  
COALITION**

‘To go fast, go alone. To go far, go together.’

- African Proverb





# Issues and Challenges Facing Pollinators

- Val Dolcini,  
President

**POLLINATOR  
PARTNERSHIP**

# The Pollinator Partnership: The Source for Pollinator Action and Information



# Pressures on Pollinators

## The Five P's

### Loss of Pasture

- Habitat loss
- Monocultures
- Urbanization
- Sprawl



### Pressures of Climate Change

- Mismatch between flower bloom, the landscape, and bee life cycles

### Pesticide Misuse

- Prophylactic use
- Monocultures
- Less farming diversity



### Parasites and Pathogens

- Honey bees subject to several diseases
- Honey bee diseases transfer to wild bees

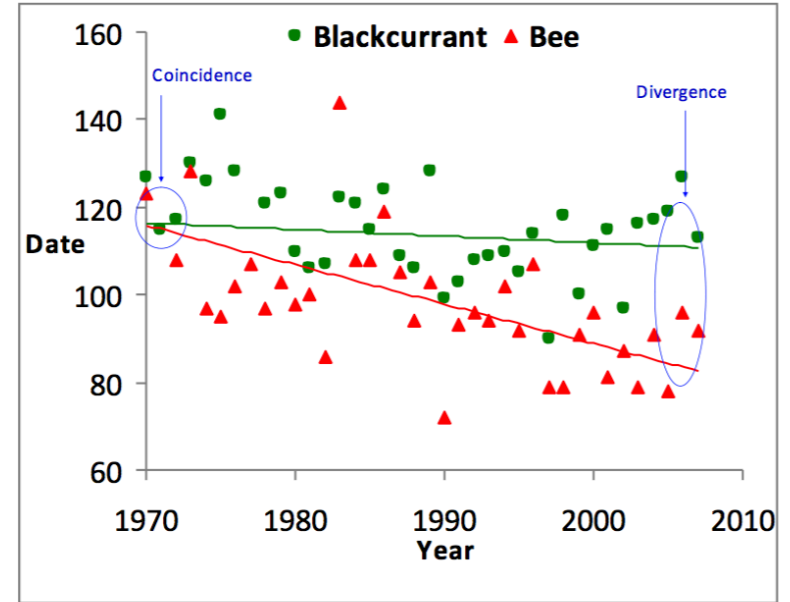
Interaction between pressures

# CLIMATE CHANGE: LIFE CYCLE MISMATCH

## The Challenge: Potential decoupling of pollination services

- Bees emerging earlier in spring than flower and crop blooms.
- Pace of climate change surpasses many species' abilities to disperse into new environments.
- Loss of habitat, independent of climate change, can reduce dispersal as pollinator and plant populations are fragmented in broad landscape.

*Historical data (1970-present) shows a 40 day shift between blackcurrant crop flowering and the Red mason bee's (*Osmia rufa*) spring emergence).*



# CLIMATE CHANGE: THE GREAT NUTRIENT COLLAPSE

## The Challenge: Climate change affects bee health and nutrition through decreased plant nutrition

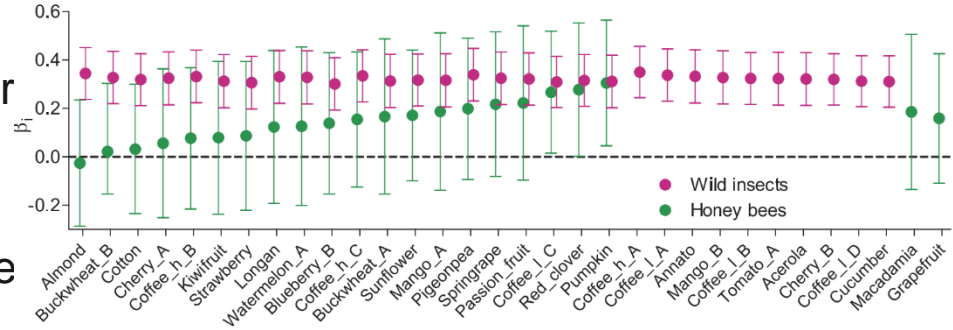
- More carbon in the atmosphere has led to decreased plant proteins.
- Poor nutrition linked to disease and pesticide susceptibility, and lower longevity in bees.
- Goldenrod pollen protein a crucial source of fall bee nutrition, has decreased by one 1/3 since the industrial revolution.



# POLLINATOR DECLINES AND FOOD SECURITY

**Declines in pollinators, wild and managed, have direct impact on food security.**

- Growth in pollinator-dependent crop outpacing growth in managed pollinator (Aizen et al. 2008).
- Wild pollinators enhance fruit set regardless of honeybees (Garibaldi et al. 2013).
- Yield losses w/o pollinators: 25% canola, 40-90% apples, +90% kiwis...
- Native bees are crop insurance, corporate social responsibility and IPM.



Effect of visitations by wild insects or honeybees on fruit set for individual crop systems (Garibaldi et al. 2013)

# Competition between Managed and Wild Bees

## **The Challenge: Keep Honey bees healthy and support the protection of wild pollinators.**

- Competition occurs when you have two or more species using the same, limited resource.
- Honey bee advantage: large numbers, generalist foragers and human management.
- Risk of disease transmission from honeybees to wild pollinators is a concern.
- Native bees are diverse, where do we expect competition?
  - Generalists: direct overlap in resource use, e.g., Bumble bees
  - Specialists: lack ability to shift forage activity



# COMPETITION STUDY: SOME PRELIMINARY FINDINGS

## Results of our study:

- Difficult to make a universal statement on competition, evidence is mixed.
- Caution placement of honey bees in areas where bumble bees are keystone and known to be vulnerable.
- Careful consideration of honey bee pasturing on natural landscapes that are home to bumble bee species at risk.
- Seasonal selection to minimize potential impacts.
- Improve agricultural land for bees, especially CRP lands.

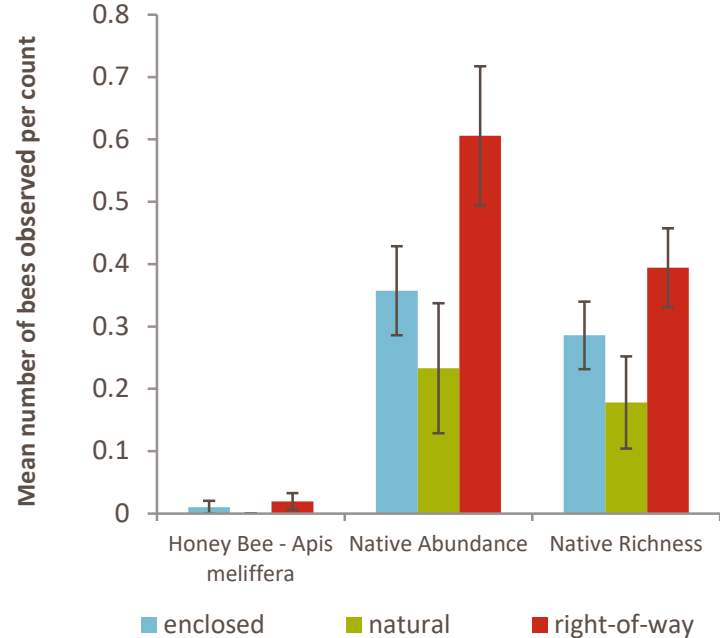




# P2 STUDY OF POLLINATORS IN RIGHTS-OF-WAYS

## Management with Integrated Vegetation Management provides superior habitat for pollinators

- Two ROW studies in California:
  - Comparison of managed ROW habitat versus unmanaged natural habitat
  - Comparison of mowing management versus selective herbicide (IVM)
- IVM increases richness and abundance of native bees 2.3x.
- Honeybees recorded in higher numbers on mowed landscapes that have more non-native species.
- ROW management that fosters low-growing flowering plants creates ideal pollinator habitat and reduces mowing and herbicide costs.



# POLLINATORS AND RIGHTS-OF-WAY (ROWS)

## ROWS in agricultural areas are an opportunity to benefit utilities and farmers

- ROWs are great opportunity to protect pollinators and increase pollinator services because they are large tracts of land under single management.
- Seeding reclaimed easements within almond growing regions with pollinator seed mixes as part of grower compensation.



# BEE-FRIENDLY FARMING THROUGHOUT NORTH AMERICA

- Over 600 Bee-Friendly Farmers across North America.
- Notable BFFs: Francis Ford Coppola Wineries, Stone Barnes Center for Food & Agriculture in the Hudson Valley, Sierra Nevada Brewing
- Bee-Friendly Farming Certification demonstrates sustainable practices to your customers and clients.
- Simple and easy criteria to meet.
- Use the logo on your website, materials, etc.



**POLLINATOR  
PARTNERSHIP**

*We thank the Almond Board  
of California for your  
support!*

[www.pollinator.org](http://www.pollinator.org)

# CEUs – New Process

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# What's Next

**Thursday, December 7 at 12:00 p.m.**

- Luncheon Presentation – Hall C

**Innovative Plant-Based Foods – An Awesome Future for the California Almond Business**

Speakers: John Haugen and Tal Ronnen, Kite Hill

*Luncheon is ticketed and is sponsored by Moss Adams*

