
THE ALMOND CONFERENCE
2025
WELCOME!
1
CULTIVATING A HEALTHIER
FUTURE

HONEY BEES & POLLINATION

Speakers

Josette Lewis, Almond Board of California

Elina Niño, UC ANR / UC Davis

Matt Beekman, California Apiaries LLC

Alexi Rodriguez, Almond Alliance

ALMOND CONFERENCE 2025

Pollination of Self-fertile Almond Varieties

Elina L. Niño
Extension Specialist
Apiculture

UC CE University of California Agriculture and Natural Resources Cooperative Extension

UCDAVIS Department of Entomology and Nematology

Honey bees are the most essential managed pollinator

Colonies have a high number of foraging individuals

They can be easily moved from crop to crop, moved or "covered" if needed for pesticide application to crop

Generalists and resource constancy

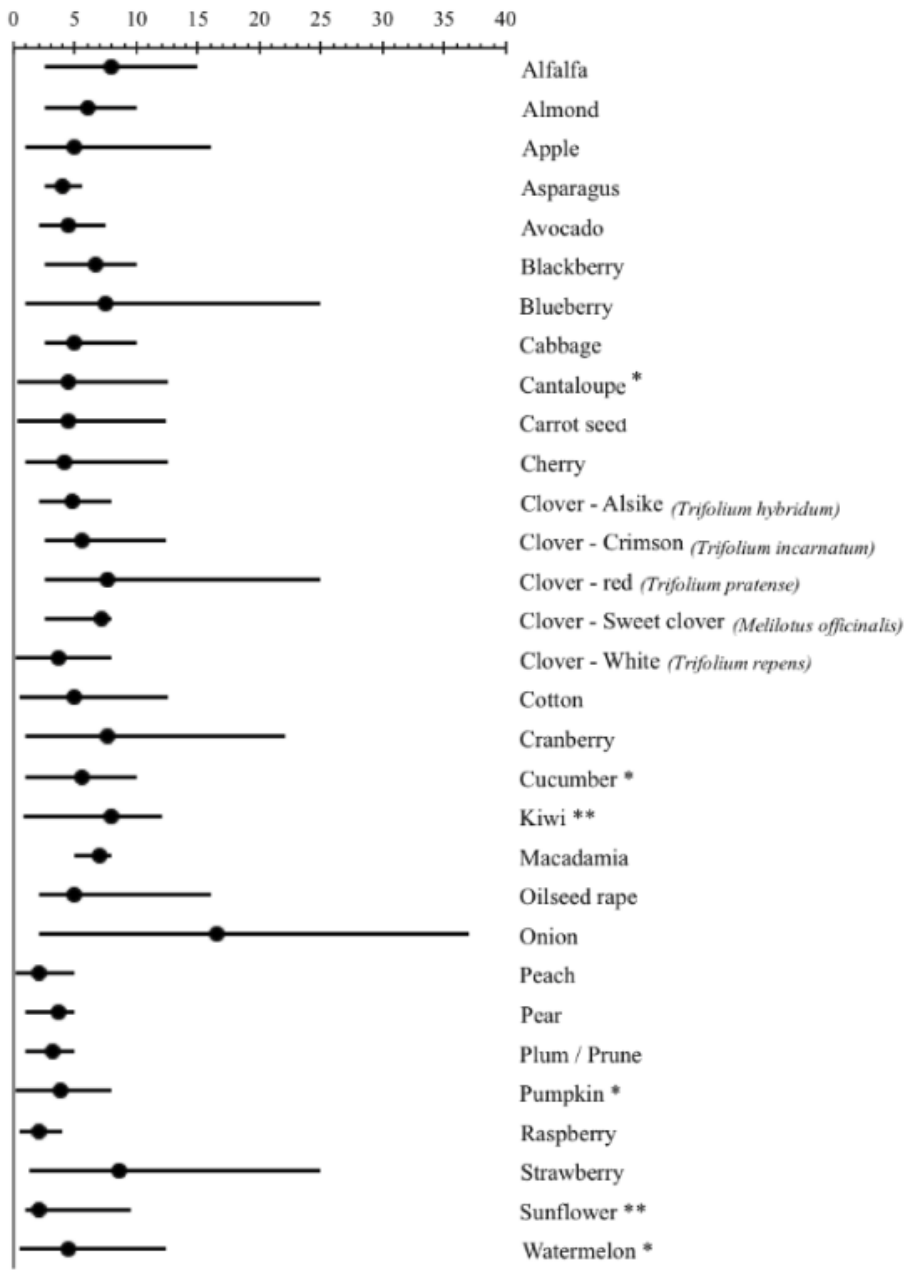
Honey Bee Pollination in California

- Honey bee colonies rented out for dozens of crops
  - Alfalfa seed
  - Cherries
  - Melons
  - Prunes
  - Plum
  - Strawberries
  - Sunflowers
  - Vegetable seeds

Start of the pollination cycle - almonds

- Estimated 2.7 colonies in US
- Reports of high losses since last fall/winter
  - Up to 60% in some operations

State	January 1 number of colonies	Maximum colonies [1]
	(number)	(number)
Alabama	7,000	7,000
Arizona	35,000	35,000
Arkansas	13,000	14,000
California	1,440,000	1,690,000
Colorado	3,500	12,500
Connecticut	3,900	3,900
Florida	305,000	315,000
Georgia	104,000	105,000
Hawaii	10,500	10,500
Idaho	81,000	88,000

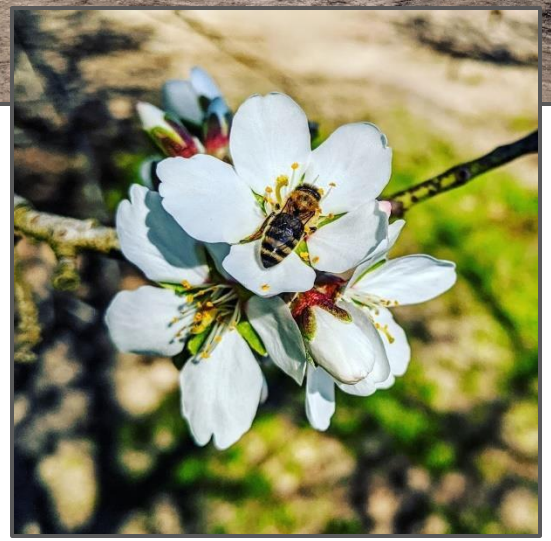


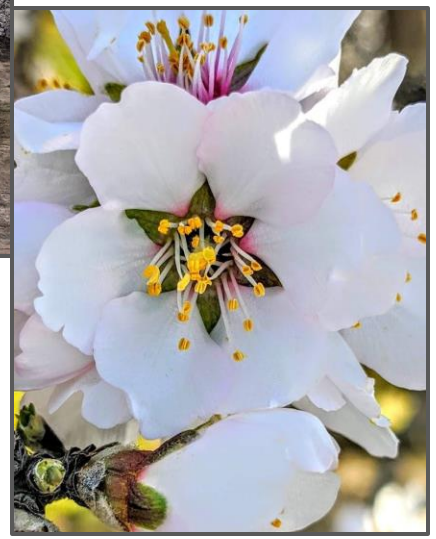
Rollin and Garibaldi, 2013 *J Applied Ecol*

Stocking rate recommendations depend on the crop

- Recommendation for conventional varieties
  - Mature orchard: 2 hives/acre
  - Cost ~$200/hive
- Need for lowering costs
  - Development of new self-fertile varieties

Pollination needs of self-fertile almond varieties





Independence
Shasta
Pyrenees
Yorizane

Collaboration with Arathi Seshadri, USDA-ARS; Zac Ellis, Olam; Angie De La Luz, Beeflow

Unsubstantieted claims can cause problems to agriculture at large

https://www.npr.org › sections › thesalt › 2016/03/23 › wi...

With Bees In Trouble, Almond Farmers Try Trees That Don't ...

Mar 23, 2016 — ... almond tree called Independence has some beekeepers nervous. **These trees are self-fertile** — meaning they technically don't need bees to ...

https://www.escalontimes.com › 209-living › independenc...

Independence Almonds: Is It Bye, Bye For The Bees?

Feb 26, 2020 — **They don't need bees**, and you harvest them all at one time," thereby saving labor costs. "They got some good qualities," Vander Veen said.

https://www.mprnews.org › story › 2016/03/24 › almo...

With bees in trouble, almond farmers try trees that don't need 'em

Mar 24, 2016 — **Independence almond** trees are easy to harvest, and they make tasty **almonds**. But what really sets them apart is the fact that they're self- ...

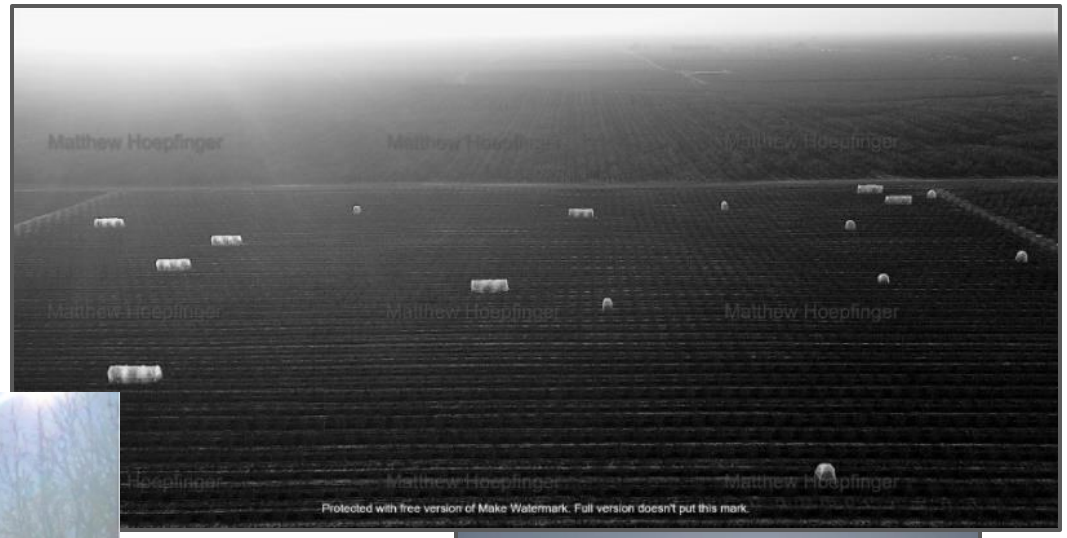
https://www.neogen.com › neocenter › blog › some-al...

Some almond trees don't need no stinkin' bees! - Neogen

Mar 31, 2016 — Some **almond** trees **don't need** no stinkin' **bees**! ... a relatively new variety of **almond** called **Independence** could change the **need** for **bees** and ...

Bee exclusion experiments

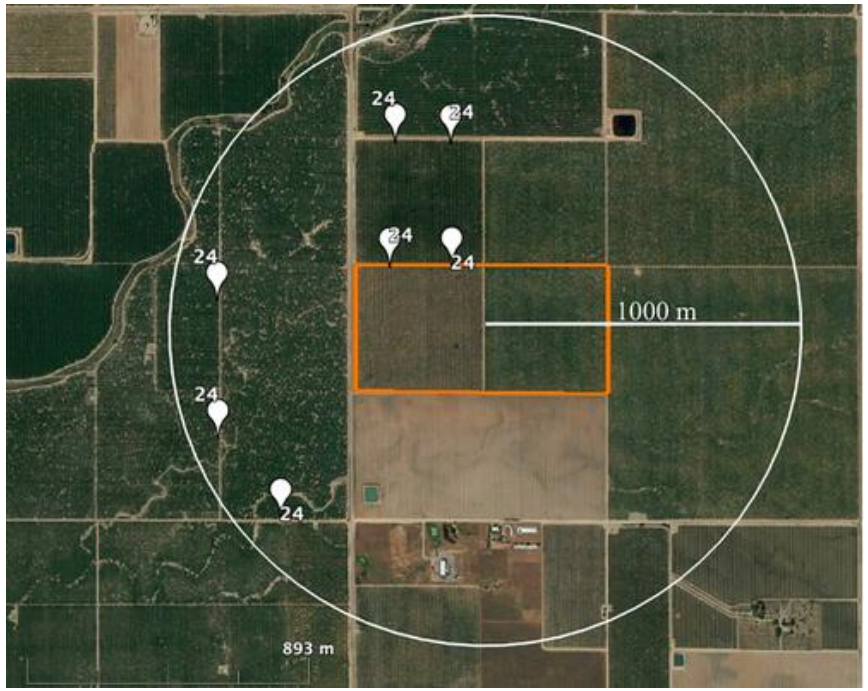
Bee visitation, nut set, yield, nut quality



De la Luz, et al. 2025, Ecol Solutions

Bee exclusion experiments

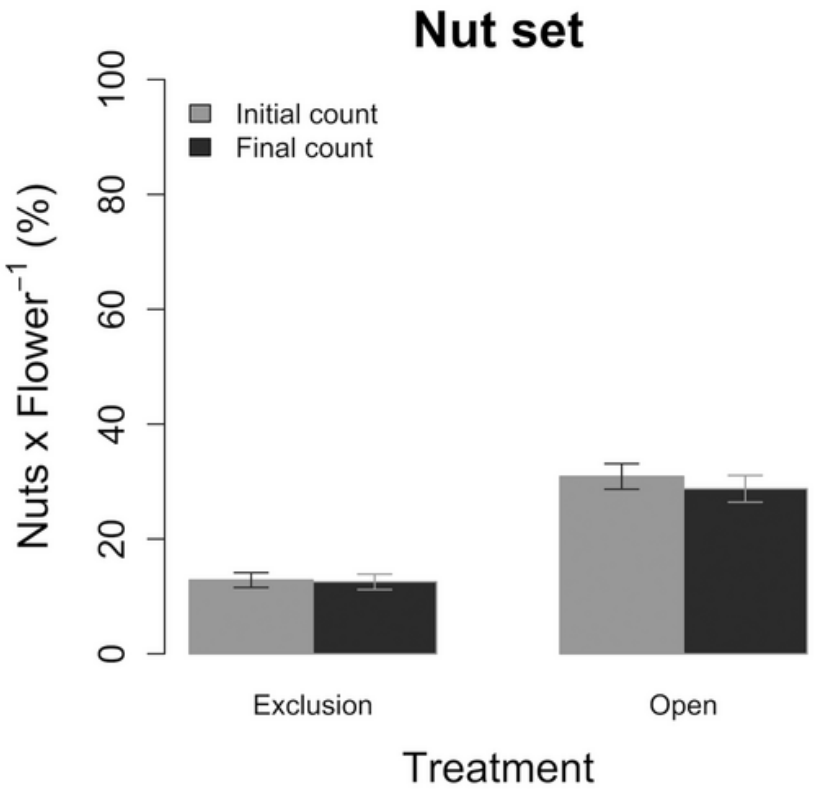
Study year	Treatments	Stocked?	Stocking density
2020	Exclusion—open	No	0*
2021	Exclusion—shade control—open	No	0*
2021	Exclusion—shade control—open	Yes	1
2021	Exclusion—shade control—open	Yes	2



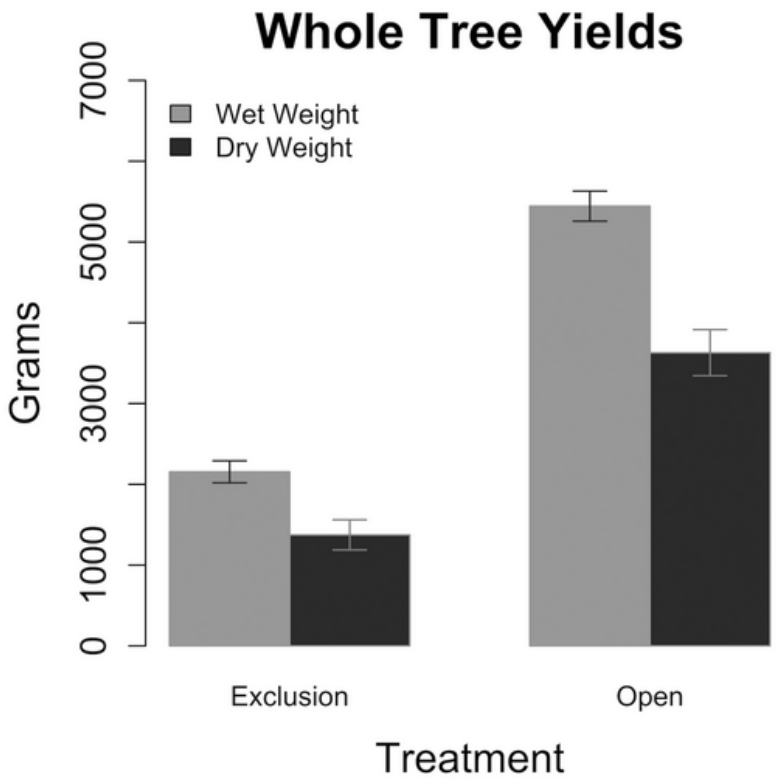
2020 – Chowchilla

2021 - Madera

De la Luz, et al. 2025, Ecol Solutions



Average percent of flowers converted into nutlets pre (initial nut set) and post (final nut set) June drop for exclusion and open branches for 2020.

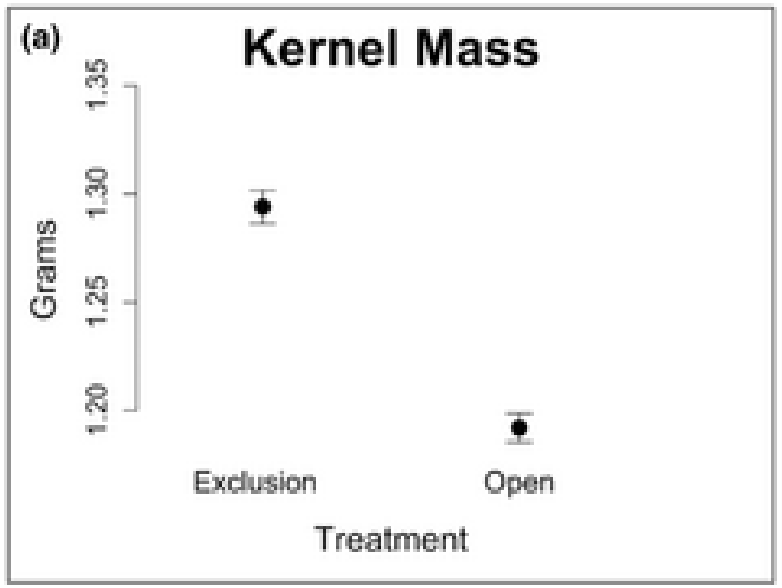


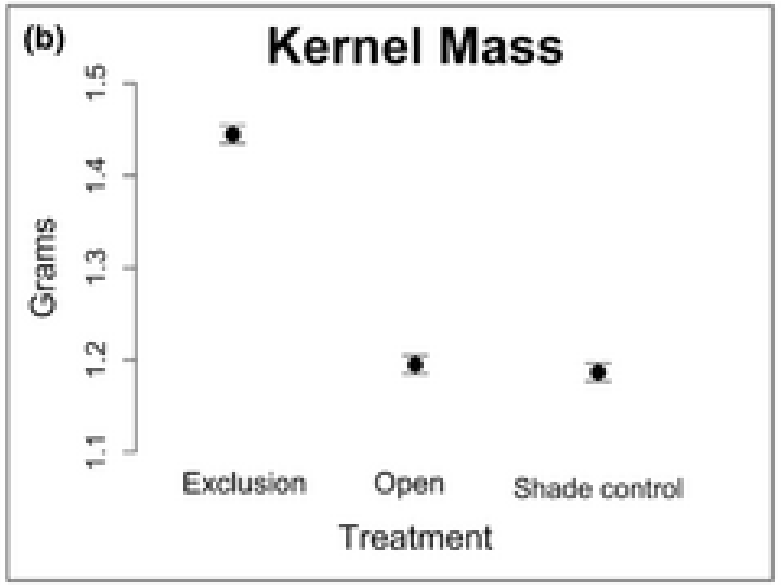
Average percent of flowers converted into nutlets pre (initial nut set) and post (final nut set) June drop for exclusion and open branches for 2020.

Significantly higher nut set and yield when bees present

De la Luz, et al. 2025, Ecol Solutions


ROW 52
ROW 51
ROW 49
ROW 45
ROW 50
ROW 53



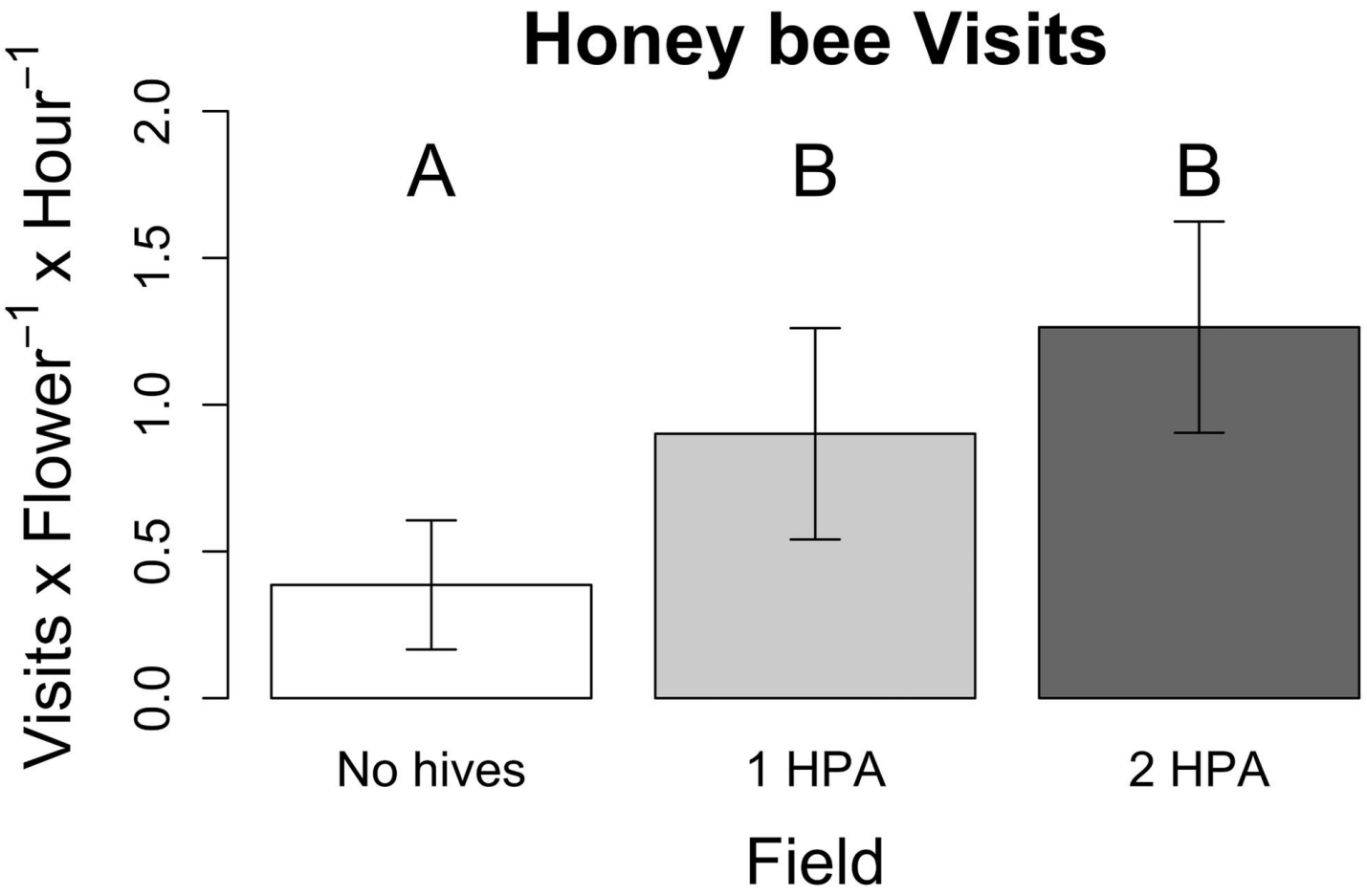


Average kernel mass for caged and uncaged trees from the (a) 2020 study year and (b) 2021.

Similar trend for shell and kernel width, length and volume. No differences for shell and kernel thickness.

De la Luz, et al. 2025, Ecol Solutions

What about stocking rates?



De la Luz, et al. 2025, Ecol Solutions

Nut set - 2021

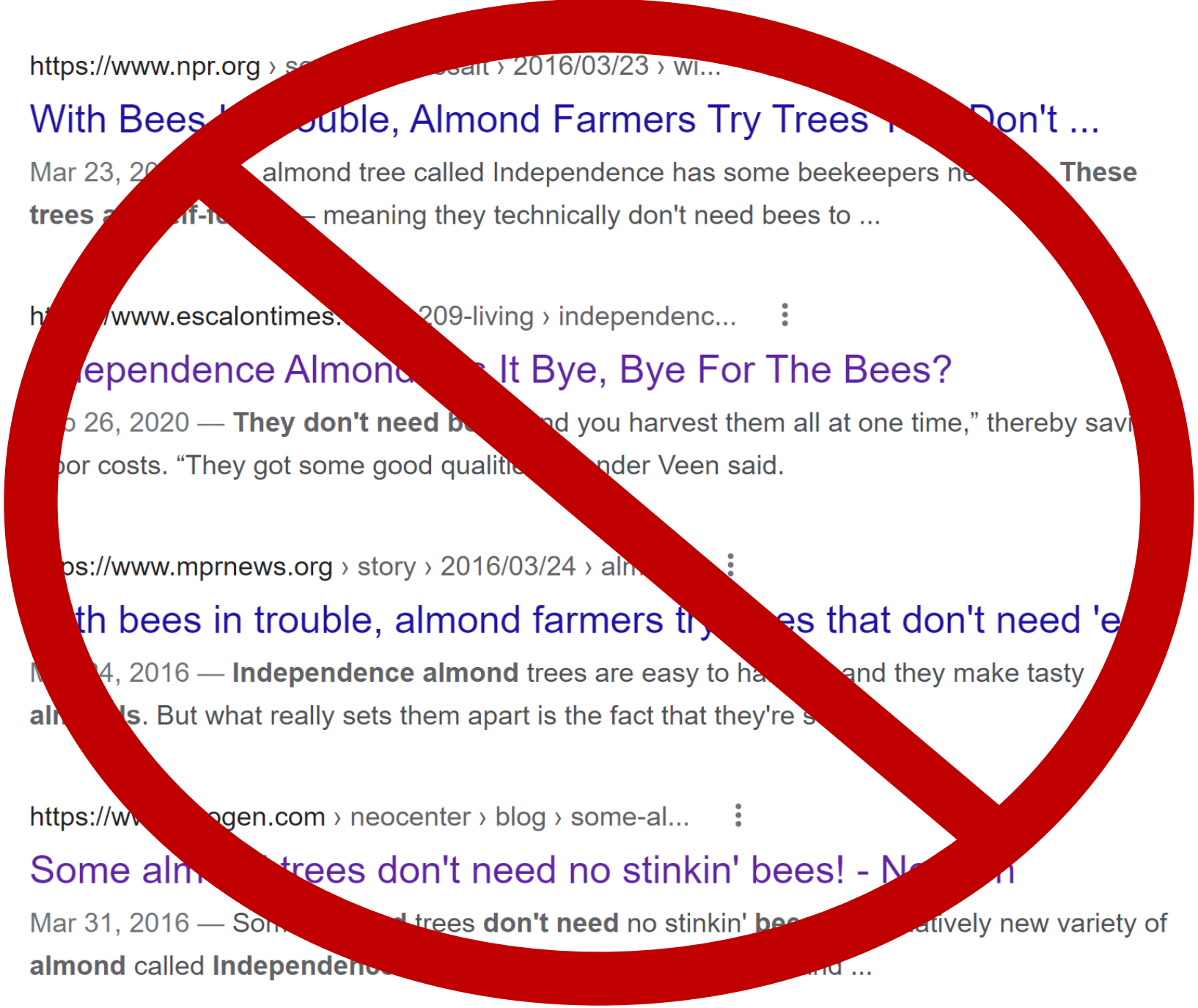
Hive density	Open	Shade control	Exclusion	*p*-Value
0 HPA	37.2 ± 3.0	NA	NA	NA
1 HPA	**46.9 ± 2.4**	**52.4 ± 4.0**	16.2 ± 2.6	<0.001
2 HPA	28.2 ± 2.9	**31.0 ± 4.4**	16.7 ± 2.3	<0.001

Initial nut set. Average (±SE) initial nut set for trees grown under 3 pollination treatments within orchards with increasing hive densities.

Hive density	Open	Shade control	Exclusion	*p*-Value
0 HPA	**32.0 ± 2.7**	NA	NA	NA
1 HPA	**32.8 ± 2.6**	**36.4 ± 4.8**	15.5 ± 2.4	<0.001
2 HPA	20.9 ± 2.1	**28.8 ± 4.2**	16.7 ± 1.6	<0.001

Final nut set. Average (±SE) initial nut set for trees grown under 3 pollination treatments within orchards with increasing hive densities.

De la Luz, et al. 2025, Ecol Solutions



Ambient hive density (hive/acre)	Hives rented	Actual hive density (hive/acre)	Plants/acre	Pollination value/acre	Value (gain/acre)	Hive rental (est.)	Value-hive rental	Gain over ambient
0.5	0	0.5	130	$4.28	$556.40	$0.00	$556.40	$0.00
0.5	0	0.5	145	$4.28	$620.60	$0.00	$620.60	$0.00
0.5	0	0.5	160	$4.28	$684.80	$0.00	$684.80	$0.00
0.5	0.5	1	130	$5.81	$755.30	$100.00	$655.30	$98.90
0.5	0.5	1	145	$5.81	$842.45	$100.00	$742.45	$121.85
0.5	0.5	1	160	$5.81	$929.60	$100.00	$829.60	$144.80
0.5	1	1.5	130	$10.10	$1313.00	$200.00	$1113.00	$556.60
0.5	1	1.5	145	$10.10	$1464.50	$200.00	$1264.50	$643.90
0.5	1	1.5	160	$10.10	$1616.00	$200.00	$1416.00	$731.20
0	1	1	130	$5.81	$755.30	$200.00	$555.30	$0.00
0	1	1	145	$5.81	$842.45	$200.00	$642.45	$0.00
0	1	1	160	$5.81	$929.60	$200.00	$729.60	$0.00
0	1.5	1.5	130	$10.10	$1313.00	$300.00	$1013.00	$0.00
0	1.5	1.5	145	$10.10	$1464.50	$300.00	$1164.50	$0.00
0	1.5	1.5	160	$10.10	$1616.00	$300.00	$1316.00	$0.00


ALMOND GROWER
RENT BEEHIVES?
DECREASE
COST
?
INCREASE
YIELD

USDA U.S. DEPARTMENT OF AGRICULTURE

Disclaimer: Mention of any products or companies does not constitute an endorsement or recommendation.

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THE STATE OF COMMERCIAL BEEKEEPING

Matt Beekman
California Apiaries
Hughson, CA

Executive Board Member
California State Beekeepers Association

Project *Apis m.*
HONEY BEE HEALTH RESEARCH

 PARASITES	 PATHOGENS	 POOR NUTRITION	 PESTICIDES
+ Varroa Mites	+ Viruses	+ Less Forage	+ Miticides and Medications
+ Small Hive Beetles	+ European Foulbrood (EFB)	+ Agricultural Pesticides	+ Insecticides
+ Tropilaelaps Mites	+ Nosema	+ Nutritional Supplements	+ Herbicides
+ Emerging Threats	+ American Foulbrood (AFB)	+ Climate Change and Nutrition	+ Fungicides
+ Climate Change and Pests	+ Climate Change and Pathogens		+ Climate Change and Pesticides

Female Varroa Destructor

By GillesSM - Own work, CC BY-SA 4.0, https://commons.wikimedia.org/w/index.php?curid=158105443

State of New Jersey

PHILIP D. MURPHY
Governor

TAHESHA L. WAY
Lieutenant Governor

DEPARTMENT OF AGRICULTURE
PO Box 330
TRENTON NJ 08625-0330

EDWARD D. WENGRYN
Secretary

October 23, 2025

New Jersey Department of Agriculture Collaborates with the United State Department of Agriculture to Mitigate Honey Bee Risk from Container Ship

The New Jersey Department of Agriculture (NJDA), in partnership with the United State Department of Agriculture (USDA), helped to successfully mitigate the risk of parasitic honey bee mites arriving at the Port of Newark, New Jersey in a swarm of bees on board a container ship.

The USDA Animal and Plant Health Inspection Service (APHIS) Plant Protection and Quarantine (PPQ) was notified by Customs Border Protection (CBP) Chief Agriculture Specialist of live bees on board a container ship. Prior to arrival at Port Newark-Elizabeth the container ship port call included the ports of Salalah in Oman and India (Mundra and Jawaharlal). The USDA and NJDA State Apiarist provided guidance to the Master Captain of the container ship through communications with the U.S. Coast Guard (USCG) on procedures to comply with USDA regulations. The vessel was ordered by Coast Guard to remain offshore until remedial safeguarding measures were performed to remove the swarm.

While the container ship was 3,600 miles off the coast of the United States, the swarm of bees were removed and safeguarded in a freezer while onboard the vessel. No brood or comb was present. The container ship provided a report, including pictures, to confirm this. The removal, containment and freezing of the bees prevented new insects from escaping into the environment.

The collected bees were sent to USDA APHIS National Identification Services for official identification. The swarm of bees was confirmed to be *Apis dorsata* Fabricius (Apidae), the giant honey bee. Two types of mites were found on the bees: *Tropilaelaps mercedesae* Delfinado & Baker (Laelapidae) mite and *Kuzinia morsei* (El-Banhawy & Abou-Awad) (Acaridae) mites.

The actions taken by the container ship were in compliance with USDA regulations. The NJDA thanks the USDA, CBP, USCG, and the container ship for their rapid communication and collaboration efforts which quickly mitigated the risk to the honey bee industry.

What does a colony look like if we could see every single bee that was fed upon by a mite?

Never parasitized

Parasitized during larval development

Parasitized during adulthood

(Lamas, Zac: UMBC)

Experimental Colony 5:

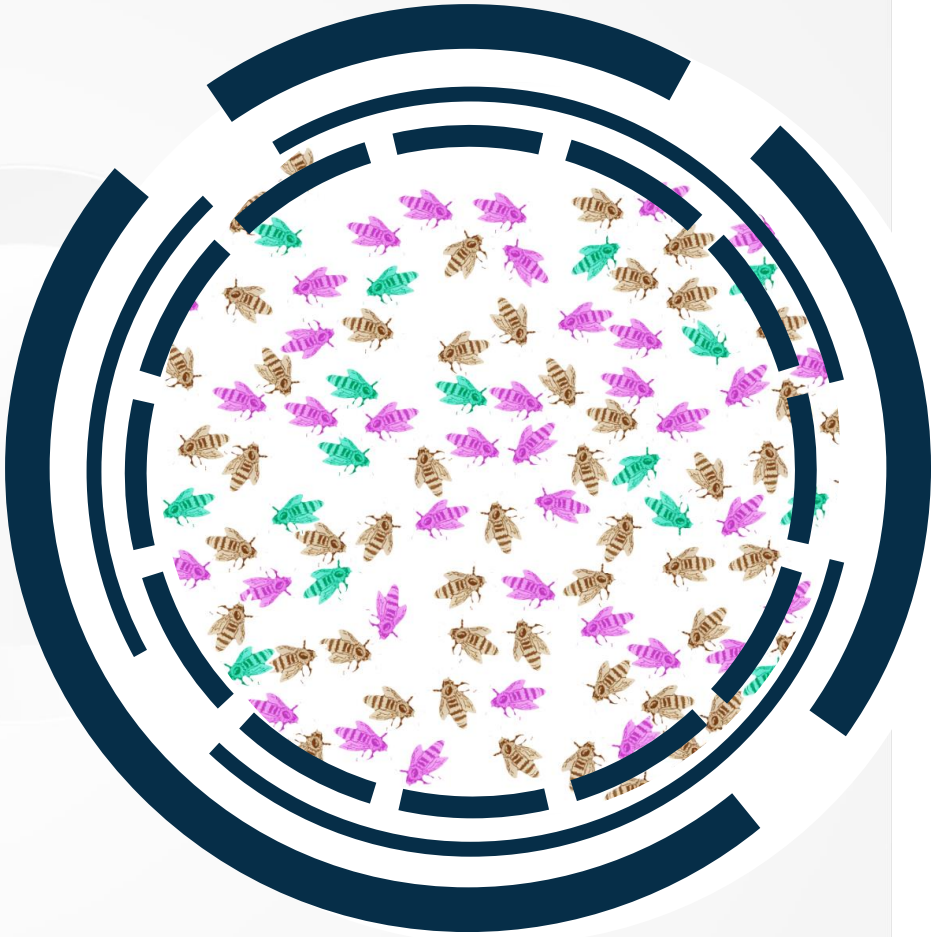
August 6, 2020

Relative parasite burden: **14.6%**

Absolute parasite burden on worker bees: **59.9%**

Absolute parasite burden on drones: **96.6%****

Workers, n = 427. Drone, n= 59



- Significantly more parasitized workers in August than July: Fisher Exact Test

  Parasitized during adulthood: p-value < 2.2e-16

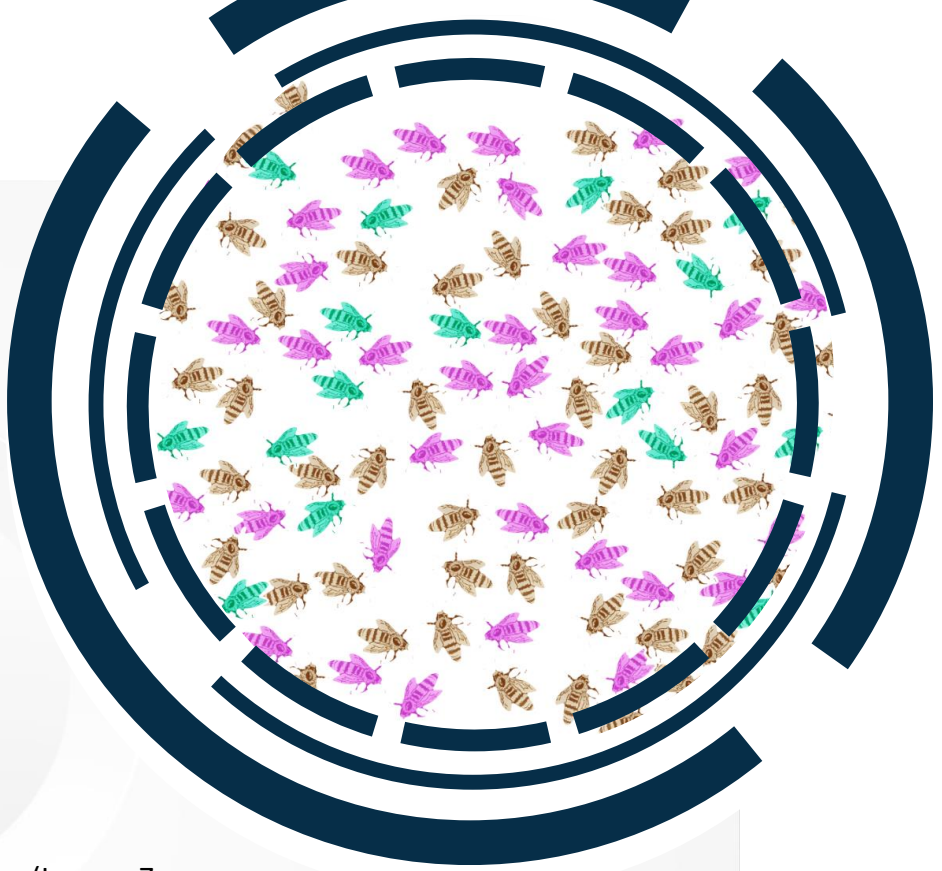
  Parasitized during development: p-value < 2.2e-16
- Significantly more bees parasitized as adults than bees which were parasitized during development:

  Kruskal-Wallis chi-squared = 426, df = 2, p-value < 2.2e-16

(Lamas, Zac: UMBC)


(Lamas, Zac: UMBC)

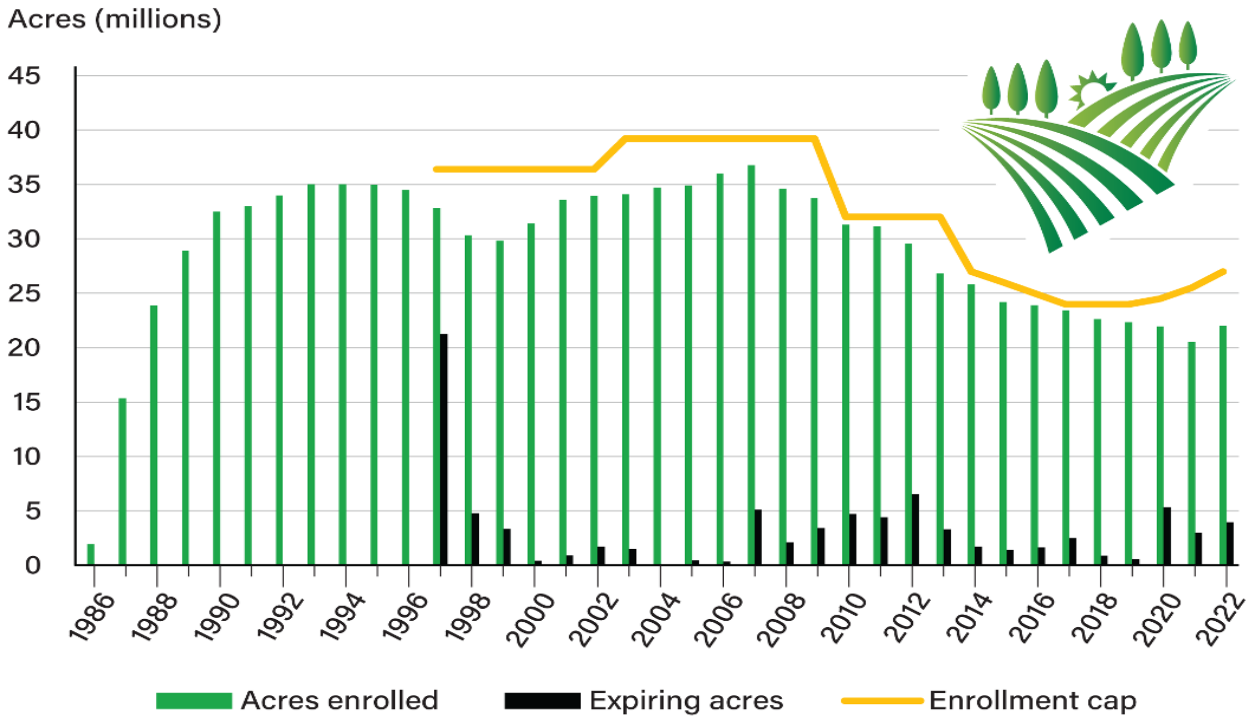
Need to be thinking about how we approach Varroa



(Lamas, Zac: UMBC)

Land enrolled in the Conservation Reserve Program (CRP), 1986–2022

USDA Economic Research Service
U.S. DEPARTMENT OF AGRICULTURE



Note: Total acres include continuing and newly enrolled acres as of Sept. 30, 2022.
Source: USDA, Economic Research Service calculations using data from USDA, Farm Service Agency.

Shannon et al., 2025

High Risk

Avoid use during bloom

Formulated Adjuvant Products

Dyne-Amic®
Induce®
Kinetic®
N-90®
Silwet L-77®
Silwet 408®
Sylgard 309®
Syl-Tac®
Surf-90®

Principal Functioning Agents

Organo-silicone surfactants[A]
Nonylphenol ethoxylates[A]
Alcohol ethoxylates[A]
N-methyl-2-pyrrolidine (NMP)
Biosoft N1-7®
Biosoft N1-9®
Makon 10®
Makon 12®
Makon DA-4®
Makon DA-6®
Makon P104®
Makon TD-9®
Makon UD-7®
Makon UD-8®
Stepflow 26®
Toximul TA-8®

Low to Moderate Risk

Use instead, at minimum labeled rates when an adjuvant is required

Formulated Adjuvant Products

Activator 90®
Attach®
Choice Weather Master®
Cohere®
Latron B®
LI 700®
Liberate®
Nu-Film P®
Silwet 719®
Silwet Eco®
Silwet L-7500 Copolymer®

Principal Functioning Agents

Alpha / Beta-Pinene
Fatty Acid Derivatives
Soybean Lecithin
Tall Oil Fatty Acids
Biosoft N1-3®
Ecostep AE-13®
Ecostep BC-12®
Ecostep CE-13®
Ecostep SE-11®
Makon 6®
Makon DA-9®
Makon TD-3®
Makon TD-6®
Makon UD-5®
Ninex MT-615®
Steol TSP-16N®
Steposol C-65®

- Bolded products indicate adjuvant products applied to >1000 almond bearing acres during bloom in 2021
- [A] - these principal functioning agents are generally considered high risk, but some low risk options have been identified

Financial Snapshot

ANNUAL COST TO MAINTAIN A COMMERCIAL COLONY 2024 *-*ANONYMOUS SURVEY OF CSBA BOARD MEMBERS*	**$350.00**
ALMOND POLLINATION	**$200.00**
THE NATIONAL AVERAGE OF PRICE PER LB. X AVERAGE NATIONAL YIELD PER COLONY	**$139.07**

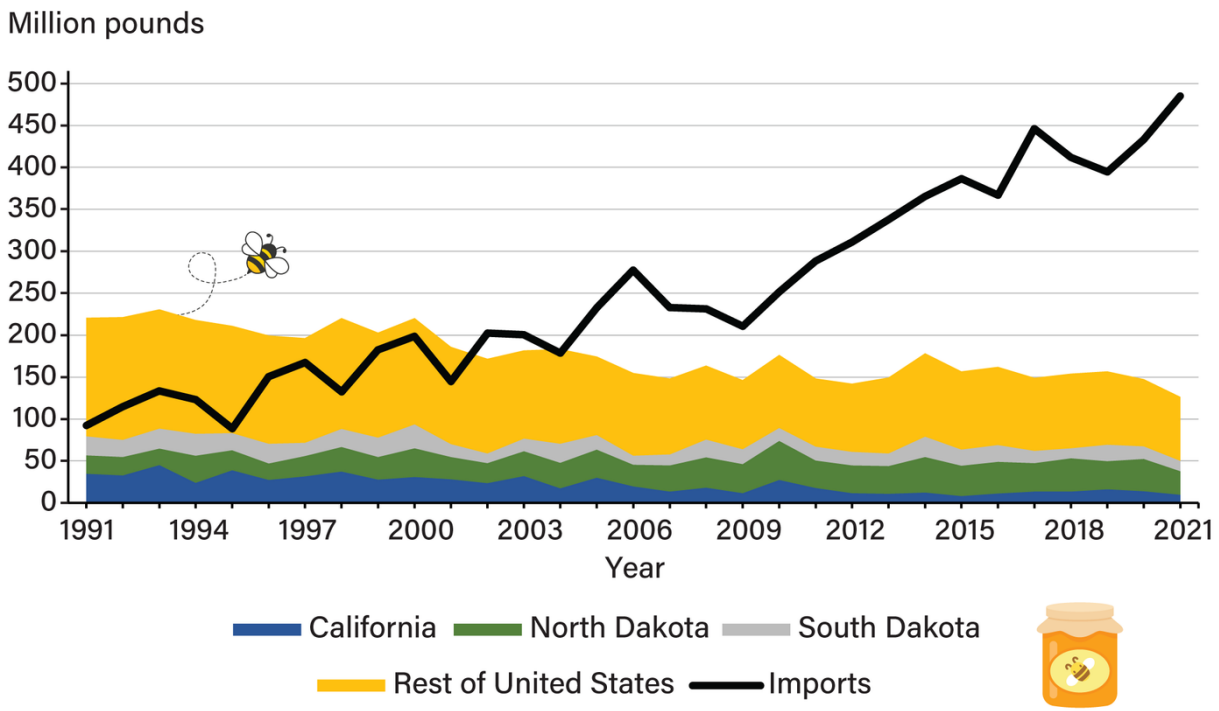
*-AVERAGE NATIONAL HONEY YIELD PER COLONY IN 2024 PER USDA - 51.7 LBS.

**-AVERAGE PRICE PER POUND OF HONEY NATIONALLY PAID IN 2024 PER USDA- $2.69*

NET PROFIT	**$ (10.93)**

U.S. domestic honey production and imports, 1991–2021

USDA Economic Research Service
U.S. DEPARTMENT OF AGRICULTURE



Source: USDA, Economic Research Service using data from USDA, National Agricultural Statistics Service and U.S. Department of Commerce, Bureau of the Census.

NATIONAL HONEY REPORT

United States Department of Agriculture
Agricultural Marketing Service
Specialty Crops Program
Market News Division
Unit 1, Produce Row Room 101
St. Louis, MO 63102
Phone: 314-425-4520 Fax: 314-621-3214
Website: www.ams.usda.gov/marketnews.htm

Volume XLV – Number 11 | Issued Monthly | November 28, 2025

HONEY MARKET FOR THE MONTH OF OCTOBER 2025
IN VOLUMES OF 10,000 POUNDS OR GREATER UNLESS OTHERWISE STATED

Prices paid to beekeepers for extracted, unprocessed honey in major producing states by packers, handlers & other large users, cents per pound, f.o.b. or delivered nearby, containers exchanged or returned, prompt delivery & payment unless otherwise stated.

- REPORT INCLUDES BOTH NEW AND OLD CROP HONEY - (# Some in Small Lot --- +Some delayed payments or previous commitment)

California	Valley	Extra Light Amber	$2.15
		Light Amber	$2.15
	Wildflower	Light Amber	$2.15
Colorado	Clover	Extra Light Amber	$2.85
		Light Amber	$2.60
	Wildflower	White	$2.60
		Extra Light Amber	$2.60
		Light Amber	$2.60
Dakota	Buckwheat	Light Amber	$1.65
		Amber	$1.90
	Canola	White	$1.65
		Extra Light Amber	$1.65
	Clover	White	$1.65 - $1.85
		Extra Light Amber	$1.65
		Light Amber	$1.65
	Clover	Light Amber	$1.85 - $1.90
		Extra Light Amber	$1.85 - $1.90
		White	$1.85 - $1.90
	Knapweed	White	$1.65
	Spurge	White	$1.65
		Light Amber	$1.65
Florida	Meltor honey	Dark	$2.00
	Palmetto	Light Amber	$2.00
	Tallow	Light Amber	$2.00
	Wildflower	Light Amber	$2.00
Georgia	Tallow	Light Amber	$2.00
	Wildflower	Amber	$1.05
Hawaii	Brazilian Pepper	Light Amber	$1.65
Idaho	Clover	White	$1.85
Kansas	Clover	White	$3.00
	Wildflower	Light Amber	$3.00
MICHIGAN	Basswood, Linden	White	$3.00
	Wildflower	Extra Light Amber	$2.60
		Light Amber	$2.60
MINNESOTA	Basswood, Linden	White	$2.30
		Extra Light Amber	$1.91
		Light Amber	$1.91
	Canola	White	$1.91
		Extra Light Amber	$1.91
MISSISSIPPI	Wildflower	Light Amber	$2.00
MISSOURI	Clover	White	$3.00
MONTANA	Clover	White	$1.65
	Spurge	Light Amber	$1.65
	Wildflower	Light Amber	$1.65
Nebraska	Basswood, Linden	White	$2.05
	Canola	Light Amber	$1.65
	Clover	Light Amber	$1.65
	Wildflower	Extra Light Amber	$1.65 - $2.05
		Light Amber	$1.65 - $2.05
Texas	Clover	Extra Light Amber	$1.90
		White	$1.90
Washington	Buckwheat	Dark	$1.65
	Canola	White	$1.65
	Carrot	Light Amber	$1.65
	Star Thistle	Extra Light Amber	$1.65
	Wildberry	White	$1.65
	Wildflower	Light Amber	$1.65
Wyoming	Alfalfa	White	$1.85

Prices paid to Canadian Beekeepers for unprocessed, bulk honey by packers and importers in U.S. currency, f.o.b. shipping point, containers included unless otherwise stated. Duty and crossing charges extra. Cents per pound.

CANADA No Sales Reported

Prices paid to importers for bulk honey, duty paid, containers included, cents per pound, ex-dock or point of entry unless otherwise stated.

ARGENTINA	Honey Dew	Extra Light Amber	$1.49	
		Light Amber	$1.32	
		Amber	$1.32	
	Mixed	White	$1.39	- $1.49
		Extra Light Amber	$1.35	- $1.49
		Light Amber	$1.32	- $1.48
		Amber	$1.22	
BRAZIL	Eucalyptus	Light Amber	$2.73	
	Mixed	Light Amber	$1.71	- $2.79
		Amber	$2.50	
	Organic	Light Amber	$2.00	- $2.78
INDIA	Mixed	Light Amber	$0.99	
	Mustard	White	$1.08	
		Extra Light Amber	$1.06	- $1.08
		Light Amber	$1.22	
URUGUAY	Mixed	Light Amber	$1.22	- $2.05
		Amber	$1.22	

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LIFESTYLE > ARTS

Nearly Half Of The Honey In European Markets Is Fake, EU Investigation Finds

By Cecilia Rodriguez, Senior Contributor.

ⓘ Cecilia Rodriguez is a Luxembourg...

Follow Author

Published Mar 24, 2023, 02:01pm EDT
Updated Mar 24, 2023, 02:55pm EDT

10 out of 13 honey brands fail 'purity test', finds CSE investigation

Updated – December 03, 2020 11:00 am IST – NEW DELHI:

The investigation also uncovered that Indian companies in the business of honey were importing synthetic sugar syrups from China for adulterating with honey.

JACOB KOSHY

UMBC

SIGN UP LOGIN

New honey bee research lab at UMBC: help me fill this space!

$31,985
Donated

31% of $100,000 goal

31
Donors

96 Days
Remaining

Make A Gift

Share Post Share

Copy to Share

This campaign ends on February 28 at 11:59PM EST

THANK YOU

California State Beekeepers Association

Telephone
(916) 441-0302

Email
calstatebeekeepers@agamsi.com

Website
www.californiastatebeekeepers.com

THANK YOU!

2025 THE ALMOND CONFERENCE

CULTIVATING A HEALTHIER FUTURE