

Bees Supply Chain Annual Contribution



Honey USA: \$350Million

Pollination USA: \$18Billion

Pollination global: \$235-577Billion



If you like to eat food, you need healthy honey bees!



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We Need Healthy Honey Bees

- 1 in 3 bites is dependent on pollinators.
- Pollination value is over 50x that of honey in USA.
- Mobile, managed honey bees play a crucial role in sustaining a reliable and nutritious food supply. USA has ~2.7million colonies.
- Almond pollination alone requires over 2 million colonies.



2

75% of food crops and 35% of the global agricultural production volume depends on pollinators



Modern cropping methods do not offer habitat to sustain the pollinators they require, so honey bees are moved in to pollinate during bloom.

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2025 Colony Losses Survey Summary

Webinar: February 28, 2025

Administered by: Project Apis m. (PAm)

With gratitude, we acknowledge the many collaborators who contributed to this work, especially USDA scientists.



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Analysis of Samples are Ongoing

USDA ARS Bee Lab, Beltsville: four-tiered investigation to determine potential causes:

- **Pathogen Screening** – Testing for all known honey bee pathogens using molecular methods.
- **Pesticide Residues & Pollen Diversity** – Examining stored pollen for pesticide contamination and plant diversity.
- **Metagenomic Analysis** – Identifying previously unknown pathogens in colonies with high disease prevalence.
- **Microbiome & Host-Pathogen Interactions** – Assessing gut bacterial diversity and potential links to colony health.

USDA ARS Bee Lab, Baton Rouge: Varroa mite resistance to Amitraz

Scott McArt, Cornell University: Pesticide residue analysis in bees, wax and bee bread

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The PAm Surveys are Complete

Jan 28 Survey 1

Feb 12 = **702 analyzed**

March 15 = **846**

Feb 10 Survey 2

Feb 12 = **97 analyzed**

March 15 = **115**

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5 Question Survey Follow up for USDA Inquiry

Thank you for providing your information regarding colony losses using the PAm survey form. You are being contacted because you indicated you were willing to provide follow-up information. All information below is voluntary and confidential, but it is being collected to answer immediate, specific attention/inquiry from USDA leadership, to assess the situation and explore how to support the industry.

- Name and operation?
- Approximately how many colonies did you have in June 2024?
- Approximately how many colonies do you have now, Feb 2025?
- Approximately how many colonies did you expect/plan to provide to pollinate almonds?
- Were you able to fulfill your almond pollination obligations without borrowing bees from other (unplanned) sources? If not, please estimate the number of colonies you are short.

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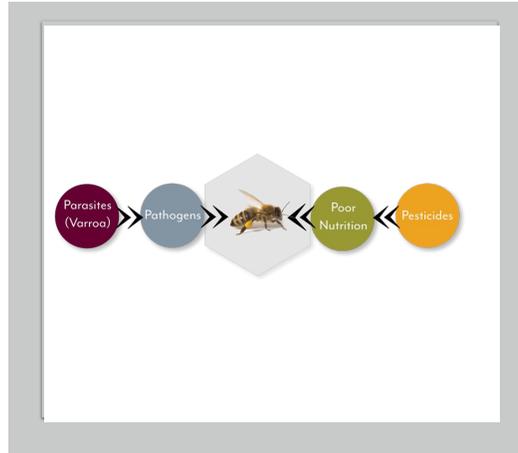
What are beekeepers' biggest problems?

Parasites: Varroa mites kill colonies if not treated.

Pathogens: Mites are a 'dirty needle' that vectors deadly viruses.

Pesticides: More agricultural exposure to crop pest control at each pollination event. Sublethal impacts lead to mortality and compromise queen quality.

Poor Nutrition: As populations urbanize, diverse agroecosystems simplify, and monoculture agriculture proliferates, floral resources diminish. Less bee pasture, less honey, nutritionally stressed hives.



Survey questions focused on management decisions and these problems.

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First PAm Survey, Jan 2025

- Launched in response to beekeepers calls to researchers with alarming losses.
- 22 questions- targeting commercial beekeepers on their way to almonds.
- Goal was to determine if this was regional or widespread, hear what beekeepers were seeing, and how to support.
- Closed March 15, **846 responses**



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Second PAm Survey, Feb 2025

5 questions. Sent to those who consented in Survey 1.
115 responses analyzed

Colonies in June: **635,858**
 Colonies in Feb: **321,574**
 Expected to take to almonds: **408,296** (NASS estimate 1.8 million 2024)
 Number of colonies short: **89,699** (4 had extra)

NASS estimate of US colonies in June 2024: 2,709,370
 Estimate of colonies represented in PAm surveys: 1,955,959 (72% of US total)
 Survey respondents' losses are 44% of total US colonies.



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All info has been made public as it comes available through joint press releases, announcements, webinars and published survey analyses. New information will be shared as it is available.






FOR IMMEDIATE RELEASE

Contact:
 Marques Chavez
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 (571) 276-6807

**Survey Reveals Over 1.1 Million Honey Bee Colonies Lost, Raising Alarm for
 Pollination and Agriculture**

Public Webinar Scheduled to Discuss Scale, Impact of Losses

SALT LAKE CITY, UTAH, Feb. 20, 2025— A nationwide survey of beekeepers has revealed catastrophic honey bee colony losses across the United States, with commercial operations reporting an **average loss of 62%** between June 2024 and February 2025. These alarming losses, which surpass historical trends, could significantly impact U.S. agriculture, particularly crop pollination for almonds, fruits, vegetables, and other essential food sources.

"Early reports of severe colony losses began pouring in last month from beekeepers across the country," said Danielle Downey, executive director of Project Apis m. "In response, a

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Commercial (500+ hives) Total Colony Loss Estimates June 2024-March 15, 2025 Project Apis m.			
State (Summer 2024)*	Mean Loss Rate	Estimated Number of Colonies Lost*	Number of responses
AL	72.1%	6,523	4
AZ	68.5%	15,349	5
CA	65.0%	148,414	32
CO	41.8%	4,109	less than 4
FL	65.3%	29,335	9
GA	71.1%	34,567	8
IA	51.8%	3,520	less than 4
ID	48.0%	36,613	12
IL	46.8%	515	less than 4
KS	80.9%	485	less than 4
KY	72.0%	468	less than 4
LA	58.6%	20,110	5
MA	82.1%	5,582	less than 4
ME	85.1%	1,531	less than 4
MI	63.7%	60,749	13
MN	58.5%	66,798	17
MO	63.0%	5,575	less than 4
MS	47.4%	9,539	4
MT	57.9%	37,841	9
NC	79.9%	16,386	less than 4
ND	64.6%	275,019	41
NE	67.2%	9,683	4
NM	83.0%	7,546	less than 4
NY	69.8%	33,235	7
OH	66.3%	4,504	less than 4
OK	83.2%	5,656	less than 4
OR	63.6%	56,452	17
PA	32.5%	2,206	less than 4
SC	50.1%	3,407	less than 4
SD	58.4%	66,252	19
TX	67.3%	55,093	14
UT	62.9%	19,832	7
WA	44.2%	20,757	9
WI	67.2%	40,430	11
WV	98.8%	431	less than 4
WY	59.4%	4,634	less than 4
NA	51.9%	38,549	10

*assumes operation size of 16798

Sideline (50-500 hives) Total Colony Loss Estimates June 2024-March 15, 2025 Project Apis m.			
State (Summer 2024)*	Mean Loss Rate	Estimated Number of Colonies Lost*	Number of responses
AL	38.9%	367	less than 4
AR	62.1%	196	less than 4
CA	70.5%	4,872	23
CO	50.8%	638	4
CT	58.4%	551	less than 4
FL	47.8%	601	4
GA	42.8%	281	less than 4
IA	56.0%	879	5
ID	48.1%	453	less than 4
IL	77.1%	726	less than 4
IN	59.4%	559	less than 4
KS	52.2%	491	less than 4
MA	40.5%	127	less than 4
MD	4.0%	12	less than 4
MI	53.3%	837	5
MN	78.0%	735	less than 4
MO	38.6%	485	4
MS	41.0%	257	less than 4
MT	63.0%	395	less than 4
NC	75.3%	1,182	5
ND	86.6%	544	less than 4
NE	34.0%	107	less than 4
NJ	19.3%	60	less than 4
NM	86.0%	270	less than 4
NV	83.8%	263	less than 4
NY	51.4%	807	5
OH	46.9%	883	6
OK	63.4%	199	less than 4
OR	50.4%	791	5
PA	46.2%	1,160	8
SC	86.3%	271	less than 4
TN	40.5%	232	less than 4
TX	37.0%	1,511	13
UT	35.4%	111	less than 4
VA	27.4%	258	less than 4
VT	63.9%	201	less than 4
WA	84.9%	267	less than 4
WI	64.9%	1,223	6
WV	96.5%	303	less than 4
WY	99.3%	312	less than 4
NA	47.7%	2,097	14

*assumes operation size of 314

Hobbyist (1-49 hives) Total Colony Loss Estimates June 2024-March 15, 2025 Project Apis m.			
State (Summer 2024)*	Mean Loss Rate	Estimated Number of Colonies Lost*	Number of responses
AL	50.4%	10	4
AR	76.0%	-	less than 4
CA	53.2%	40	16
CO	66.9%	47	14
CT	59.8%	12	4
DE	0.0%	-	less than 4
FL	27.6%	8	6
GA	42.9%	19	9
HI	27.1%	4	3
IA	59.9%	15	5
ID	46.5%	12	5
IL	63.0%	32	10
IN	45.7%	7	4
KS	42.2%	6	less than 4
KY	49.2%	10	4
LA	54.2%	8	less than 4
MA	32.1%	18	8
MD	72.5%	11	less than 4
ME	52.5%	5	less than 4
MI	68.3%	38	11
MN	54.5%	14	6
MO	20.6%	7	8
MS	52.0%	3	less than 4
MT	0.0%	-	less than 4
NC	38.0%	13	7
NE	31.6%	5	less than 4
NH	87.5%	4	less than 4
NJ	87.5%	9	less than 4
NM	99.9%	5	less than 4
NY	39.8%	24	12
OH	59.9%	36	14
OK	74.3%	4	less than 4
OR	46.2%	21	9
PA	59.5%	98	33
SC	54.0%	3	less than 4
SD	85.0%	9	less than 4
TN	38.1%	6	less than 4
TX	36.8%	112	67
UT	36.6%	9	5
VA	52.0%	26	10
VT	100.0%	5	less than 4
WA	64.1%	26	9
WI	66.0%	36	11
WV	17.0%	4	5
WY	64.6%	189	60

*assumes operation size of 5

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Survey Results: Preliminary Findings & Ongoing Analysis

This presentation covers some key findings, with more complex results to be released in the future as analysis progresses. (eg. mite treatments, feed supplements)

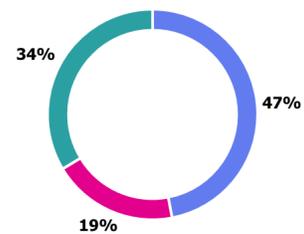
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PAm Survey update: here is more detailed information about the PAm survey responses, broken out by operation size and state. If beekeepers provided their number of colonies, that was used for calculations. If they did not, the survey average for sideline and commercial beekeepers was used. For hobbyists, a 5 colony average was used.

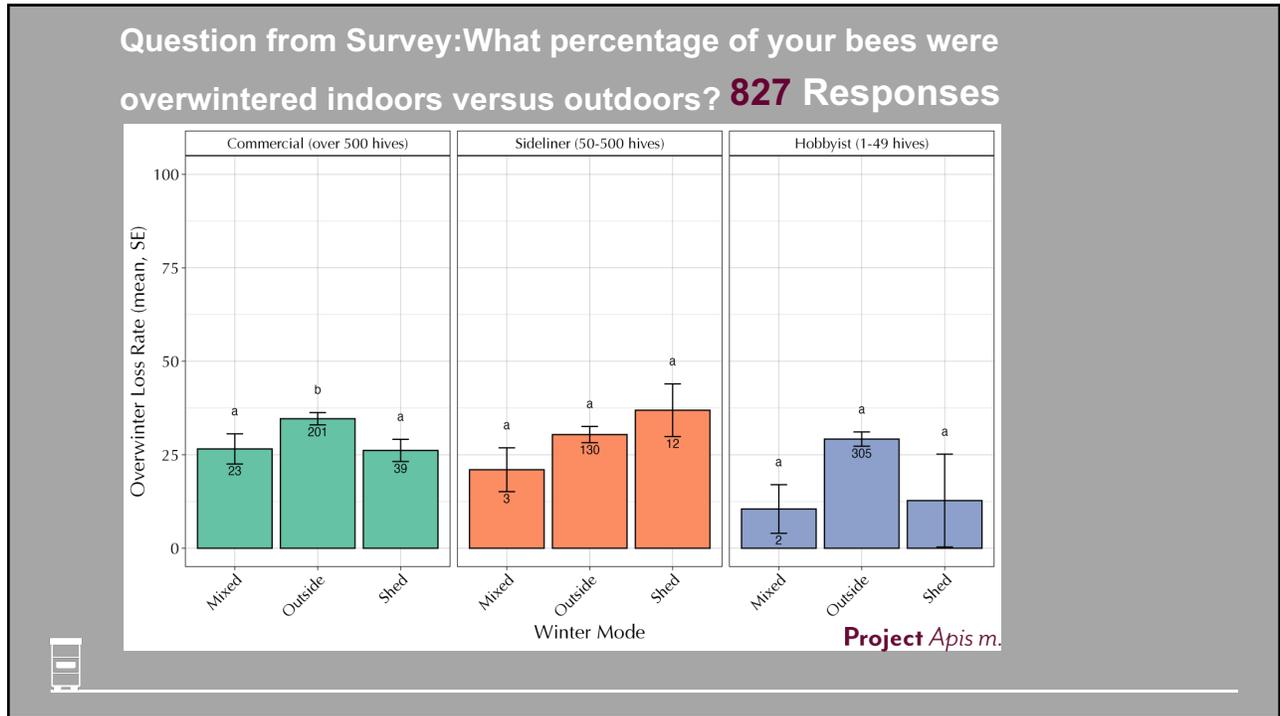
Estimating Total Colony Loss			
Beekeeper Class	Mean Loss Rate	Using number of colonies reported OR if not reported average colony number was Hobby=5, Sideline=374, Commercial=6798	Number of responses
Hobbyist (1-49 hives)	51.2%	974	393
Sideline (50-500 hives)	53.9%	26,645	161
Commercial (over 500 hives)	62.3%	1,147,613	280
Not listed	40.0%	-	8
TOTAL	55.3%	1,175,232	842

What is the size of your business?

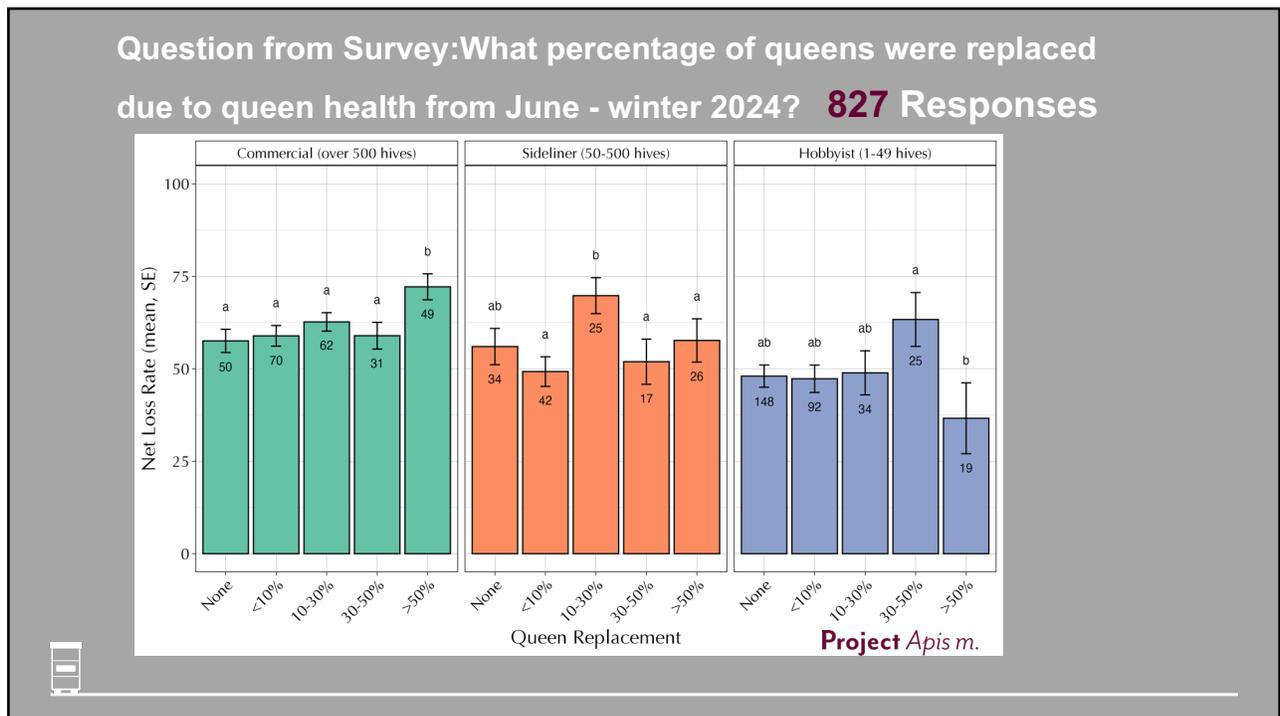
- Hobbyist (1-49 hives) 394
- Sideline (50-500 hives) 162
- Commercial (over 500 hives) 282



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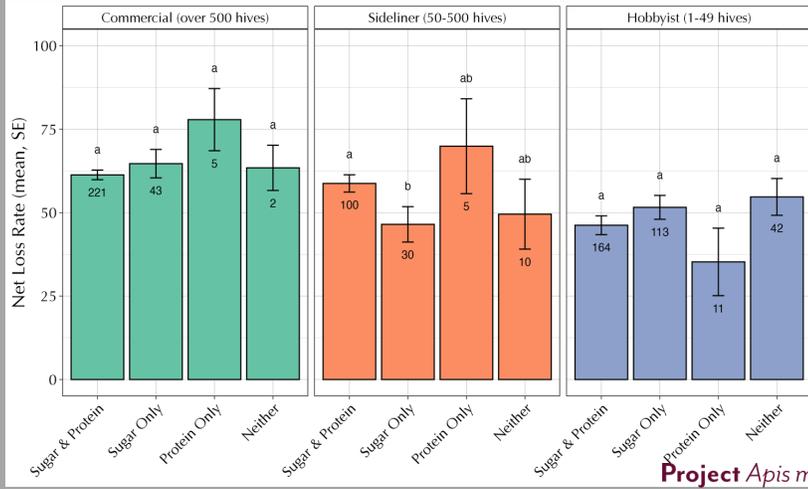


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Questions from Survey:

Did you supplementary feed your bees sugar or syrup? If yes, what months? **833 responses**

Did you supplementary feed your bees protein pollen, substitutes? If yes, what and when? **822 responses**



(analysis ongoing:
P. Chakrabarti)

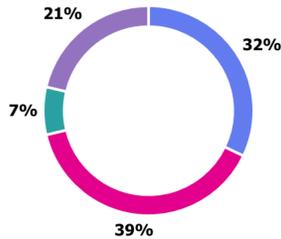


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What were your average Varroa mite levels in the Fall?

- 0-1 mites per 100 bees 266
- 2-5 mites per 100 bees 325
- 5+ mites per 100 bees 61
- did not test 177



829 responses



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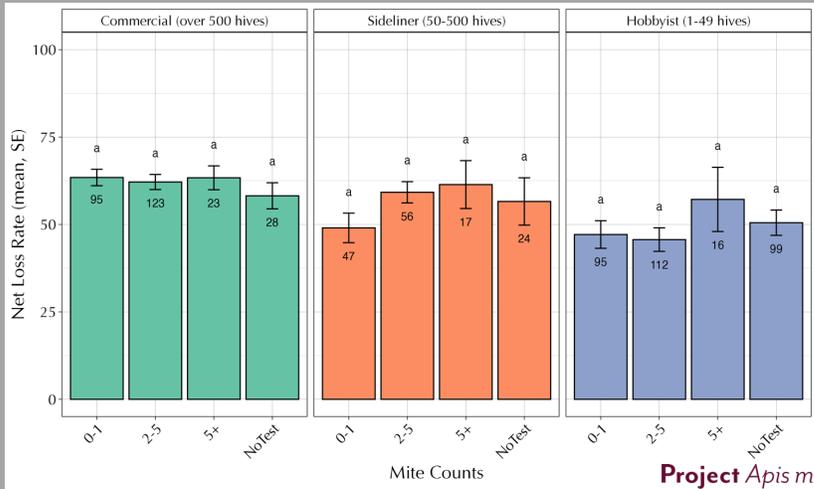
How often did you treat for mites with what from June-December 2024?

(analysis ongoing: K. Lee)



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What was your average Varroa mite count in Fall?



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Estimating Total Colony Loss

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How bad were the losses?

Survey estimates **1,627,314** colonies were lost in USA, resulting in the following economic losses:

Colony Losses & Economic Impact

Conservatively estimated at over **\$600million** based on \$253 per colony replacement cost and inputs, lost pollination in almonds, and honey income.

Additional Impacts

- Crops may be impacted by shortage of bees.
- Lower yields, lower quality, lower availability, higher costs.
- Rebuilding businesses may take more than one year.
- Some businesses may fail.

“Dead hives don’t make honey”



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How does this compare to other surveys/ years?

- **USDA NASS *Honey* report**
 - Number of colonies producing honey (by state and U.S.)
 - Annual; since 1961
- **USDA NASS *Honey Bee Colonies* report**
 - Number of honey bee colonies, colony losses and health stressors
 - Quarterly; since 2016
- ***US Beekeeping Survey***
 - Lead by Auburn University & AIA (previously, BIP and UMD)
 - Colony loss rates and risk factors
 - Annual; since 2008



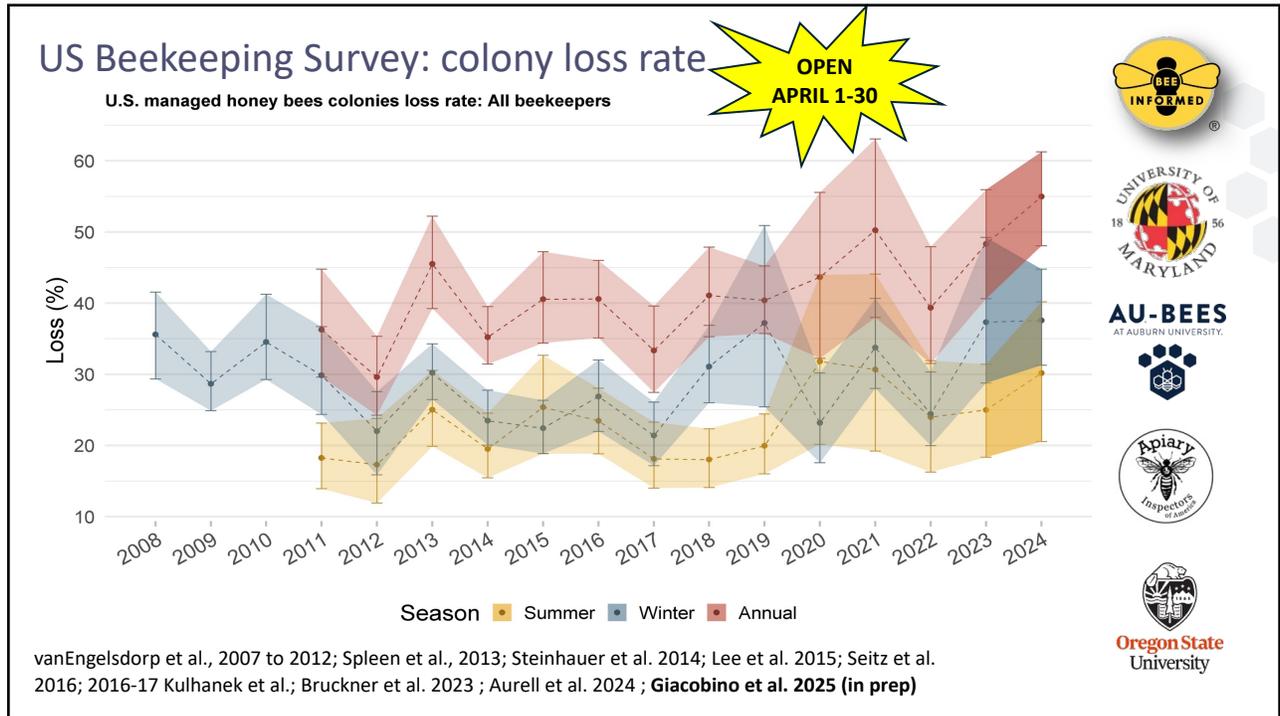
**OPEN
APRIL 1-30**

*Survey Context:
Dr. Nathalie Steinhauer, OSU*

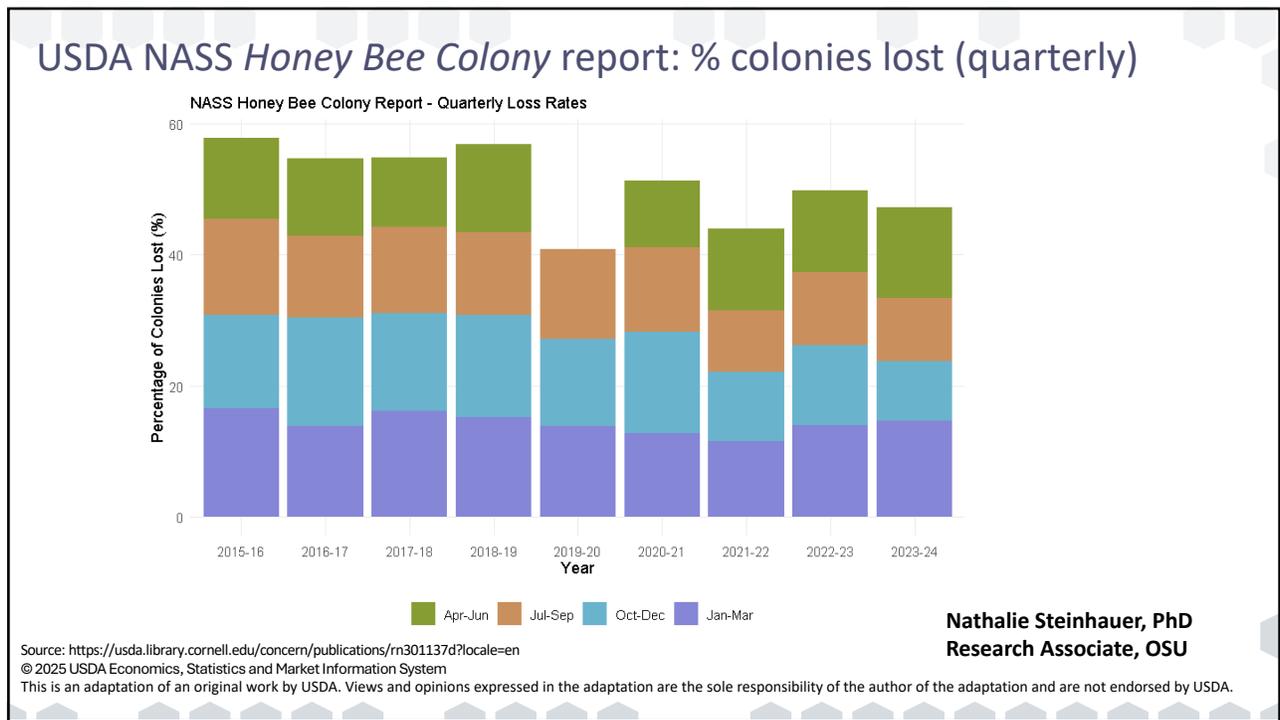


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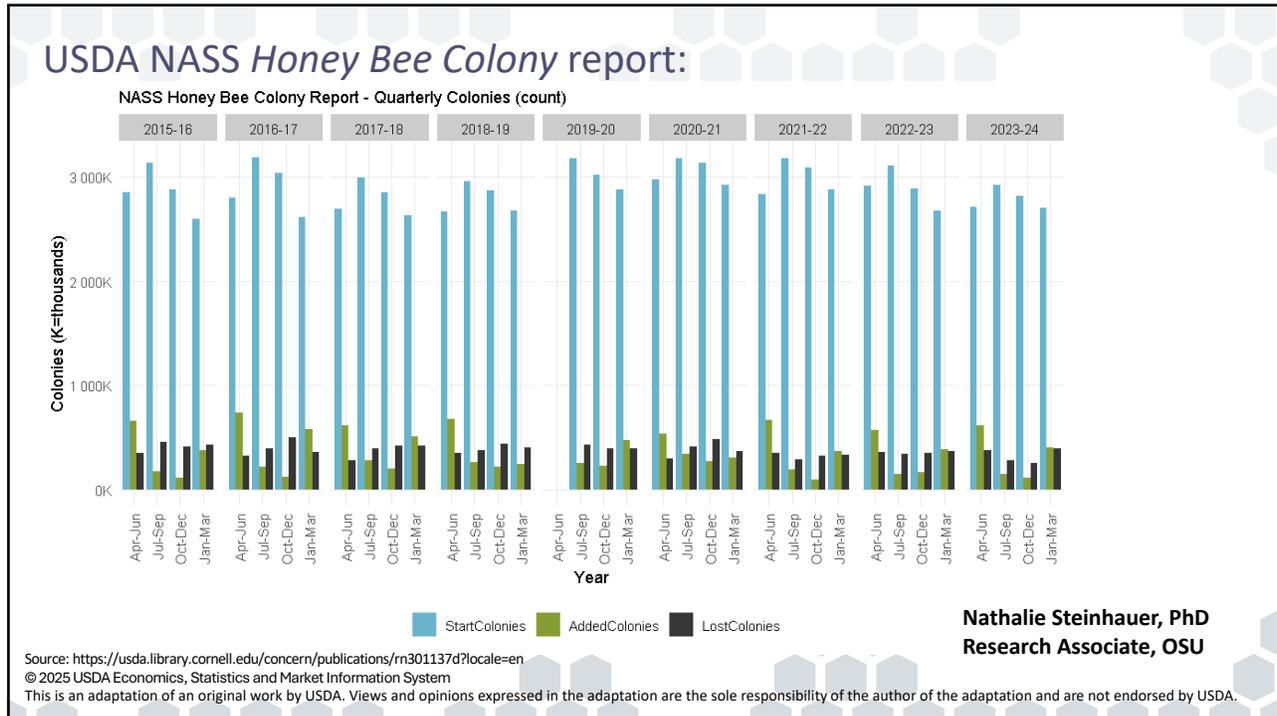
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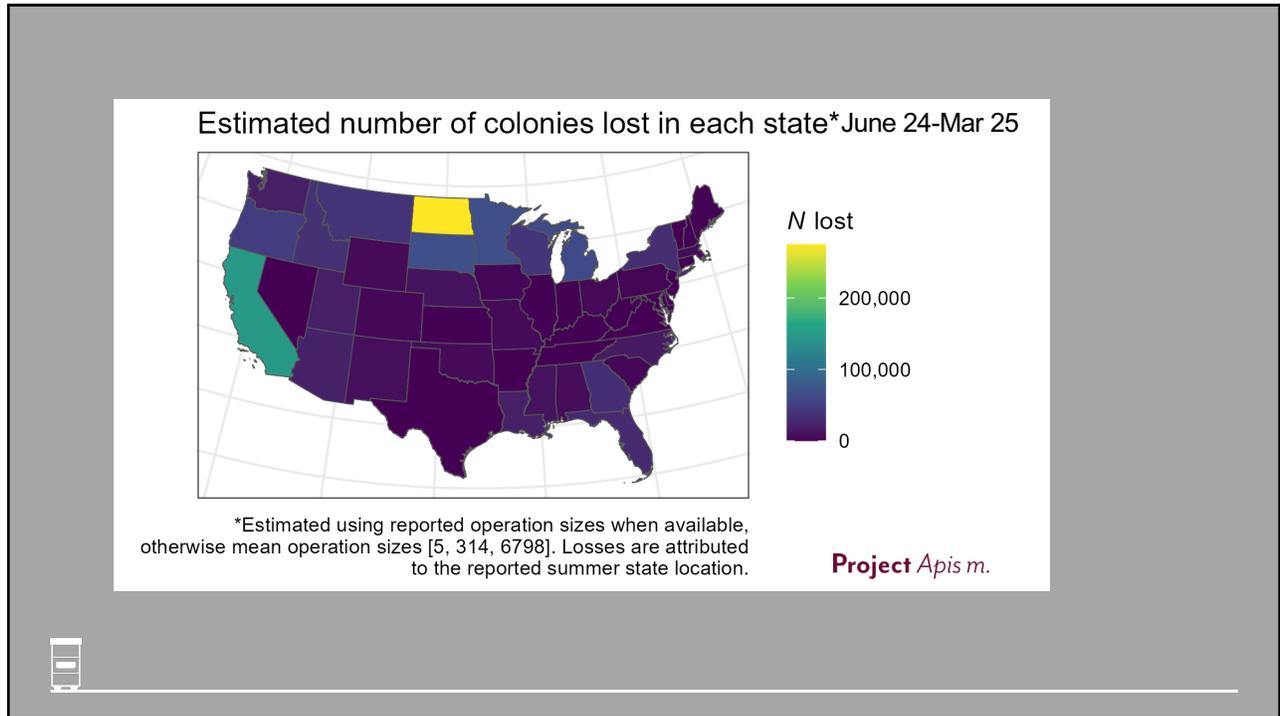
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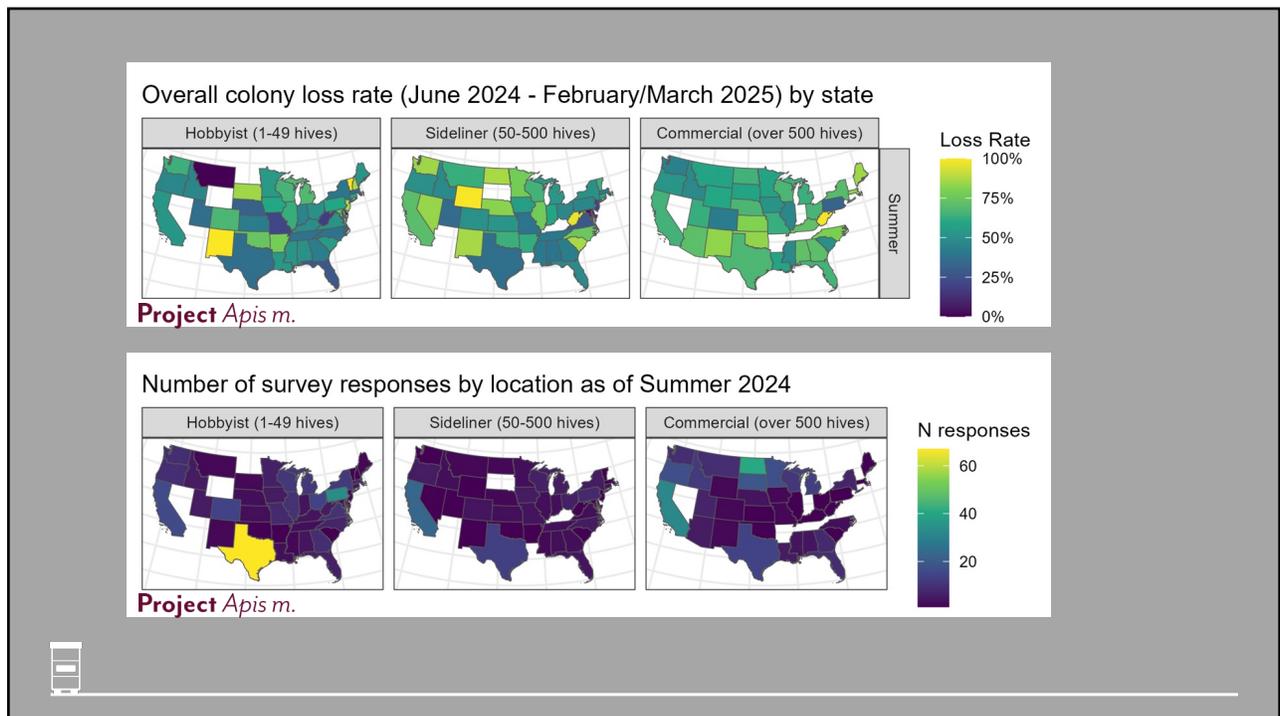
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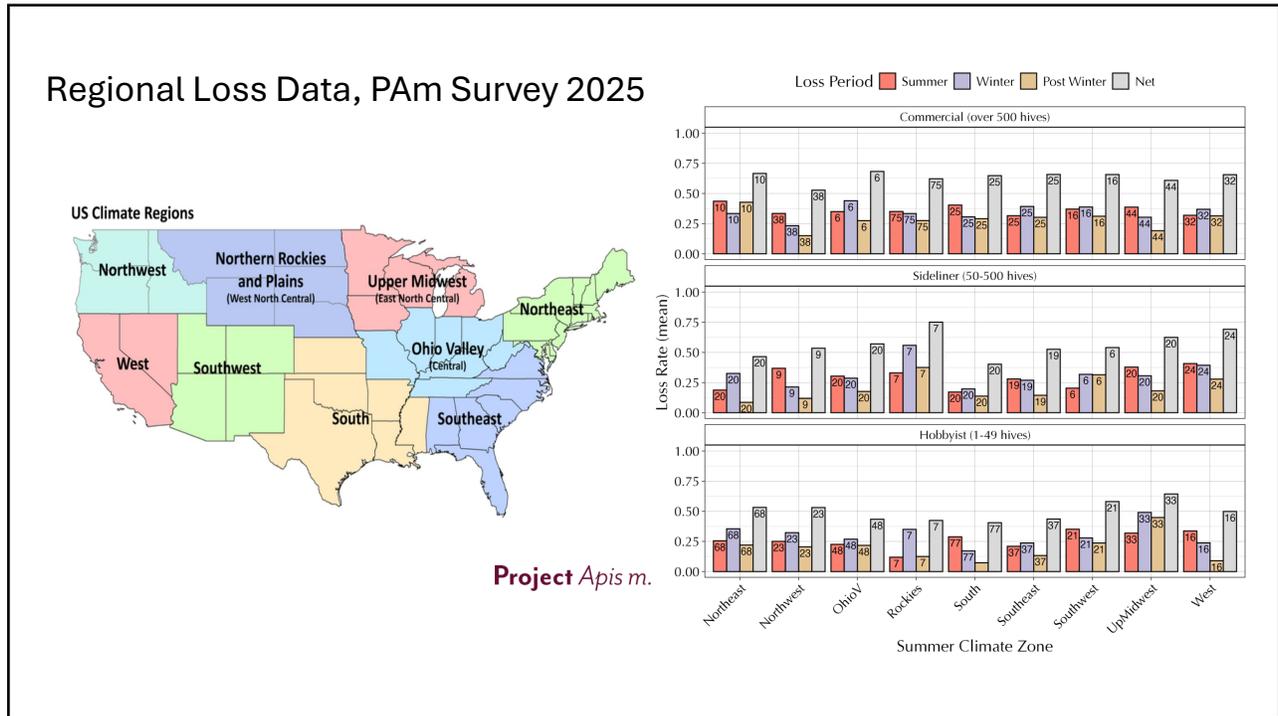
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Samples Collected, from healthy and failing apiaries in CA

- 500 samples, 155 colonies and dead-outs, 9 operations**
- Live bees**- snapshot of current pathogens, residues, health.
- Bee Bread**- Examine stored pollen for contaminating residues & pollen diversity
- Honey & Wax**- longer term reservoir for residues.

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Analysis of Samples

USDA ARS Bee Lab, Beltsville: four-tiered investigation to determine potential causes:

- **Pathogen Screening** – Testing for all known honey bee pathogens using molecular methods.
- **Pesticide Residues & Pollen Diversity** – Examining stored pollen for pesticide contamination and plant diversity.
- **Metagenomic Analysis** – Identifying previously unknown pathogens in colonies with high disease prevalence.
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USDA ARS Bee Lab, Baton Rouge: Varroa mite resistance to Amitraz

Scott McArt, Cornell University: Pesticide residue analysis in bees, wax and bee bread
With funding from One Hive Foundation

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Pesticide Residue Analysis Dr. Scott McArt, Cornell University

~500 samples for LCMS. Bees, bee bread (pollen), wax, honey

Samples received late Feb, Results in 2-4 months.

Pesticide residue screen list on website here:

<https://blogs.cornell.edu/ccecf/pesticides/>



Samples will be split to run GCMS for pyrethroid insecticides and some non-polar fungicides later this summer/fall.



One Hive
Foundation

Also has the survey data submitted detailing beekeeper's specific pesticide concerns



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Thank you!

USDA ARS bee research labs, especially Beltsville for responding to beekeepers quickly, collecting samples, and leading ongoing analyses. Many other ARS Bee Labs will be assisting with ongoing work. USDA Office of the Chief Scientist for leadership and data analysis Other Scientists and Experts in honey bee research, who are offering time and insights.

Industry Partners who collaborated to help with surveys and raise awareness.

Extension specialists, Apiary Inspectors, Bee Clubs near you.

Honey bee failures can impact agriculture and food supply, thanks for helping raise awareness.



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Thank you!

- Beekeepers throughout the USA, who work tirelessly to provide the pollination services we all rely on.
- If you like to eat healthy food, you need healthy honey bees!
- Buying US honey helps our beekeepers stay solvent.



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