

# Project *Apis m.* Survey Summary

February 20, 2025

With Gratitude and Acknowledging MANY collaborators, especially USDA scientists

Press Release today

<https://mailchi.mp/keystone.org/colonylosssurvey?e=a6264eb837>

Webinar 28 Feb noon EST:

<https://www.projectapism.org/events/i8yr94doxarjvh453lchfhr0xf3bvq>

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1

## A note to participating beekeepers:

Project *Apis m.* appreciates the trust beekeepers placed in us to give their time and confidential information in this survey. We know beekeepers get tired of surveys, especially if there is no information provided back.

The analysis of the information you provided is ongoing, and more complex data will be shared as it is available.

For now, here are some relatively raw summaries that participants may find interesting, which will accompany the press release summary for more general audiences.

*Thank you!*

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2

# Free Public Webinar on February 28 to Share Updates

To help beekeepers, farmers, and policymakers understand the scale of these losses and ongoing research efforts, a free public webinar will be held on **February 28, 2025**, 9am Pacific, hosted by Project Apis m. to share information with stakeholders about progress analyzing the survey data and the samples taken. The webinar will provide updates on:

- Preliminary findings from field samples
- Emerging trends from beekeeper survey data
- Potential management recommendations based on early analyses

- Use this link to attend the webinar:

<https://www.projectapism.org/events/i8yr94doxarjvh453lchfhr0xf3bvq>

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3

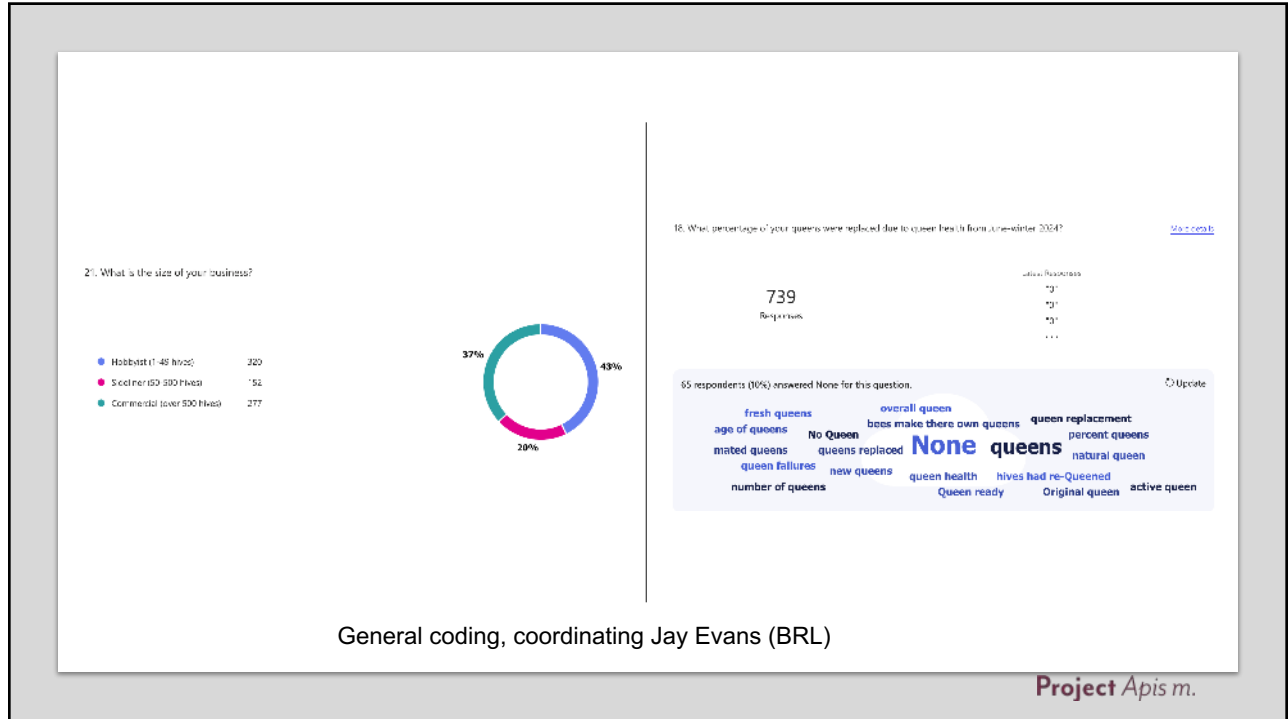
## PAm Surveys (still active for input)

- Jan 28 posted, Feb 10 n = 702:
  - name (optional), class, questions about losses June Feb in 3 periods-fall, winter and post winter check. Col size, location (3 periods), suspected factors (and detail), mite trts, fall Varroa levels, other pests, supplemental feed (syrup, protein, when and what), queen replacement, indoor vs outdoor wintering and loss comparison, financial concern scale, contact consent.
- Feb 12 n = 97:
  - Name, June col #, Feb col #, expected pollination units, able to fulfil? If not, how many short? Date finished placing bees.



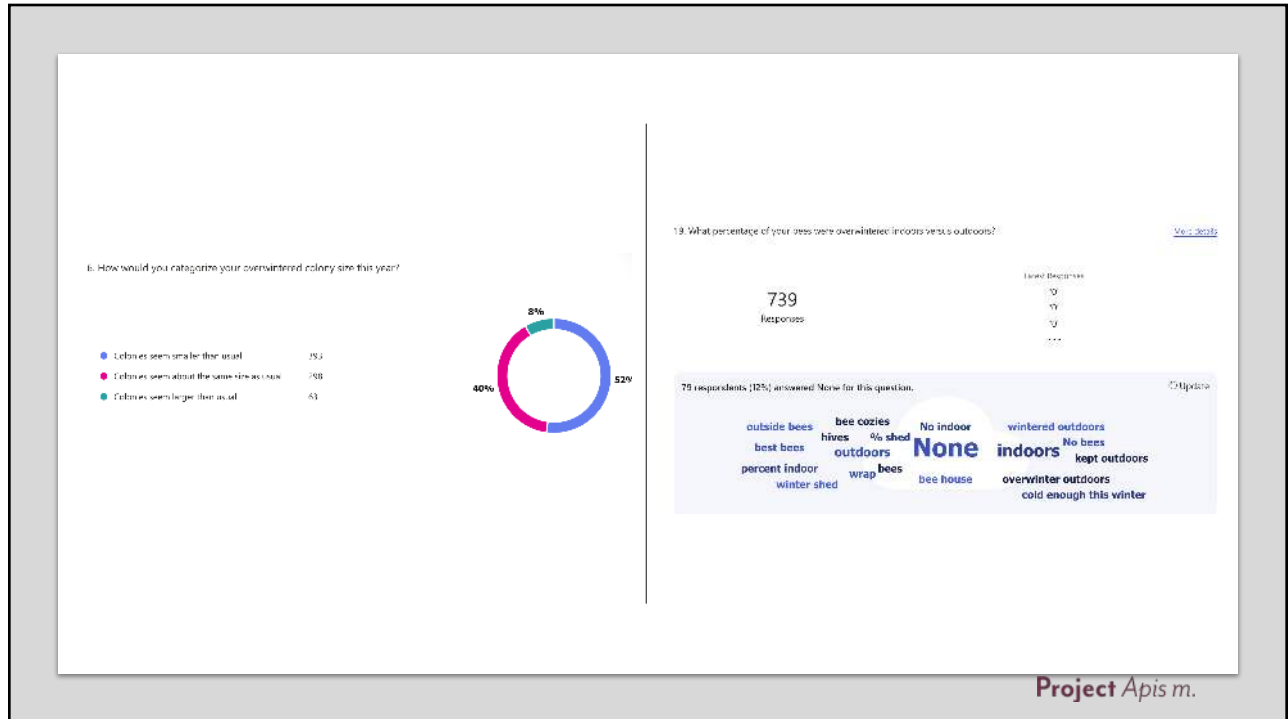
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4



General coding, coordinating Jay Evans (BRL)

5

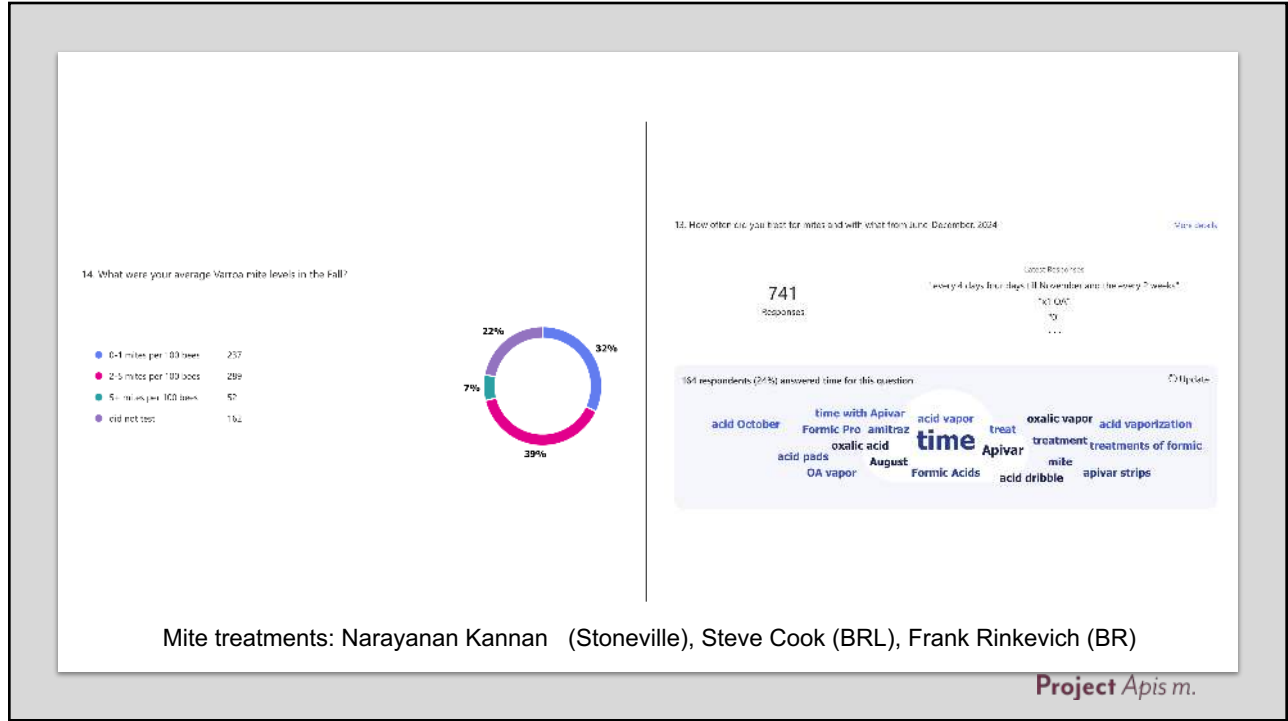


6



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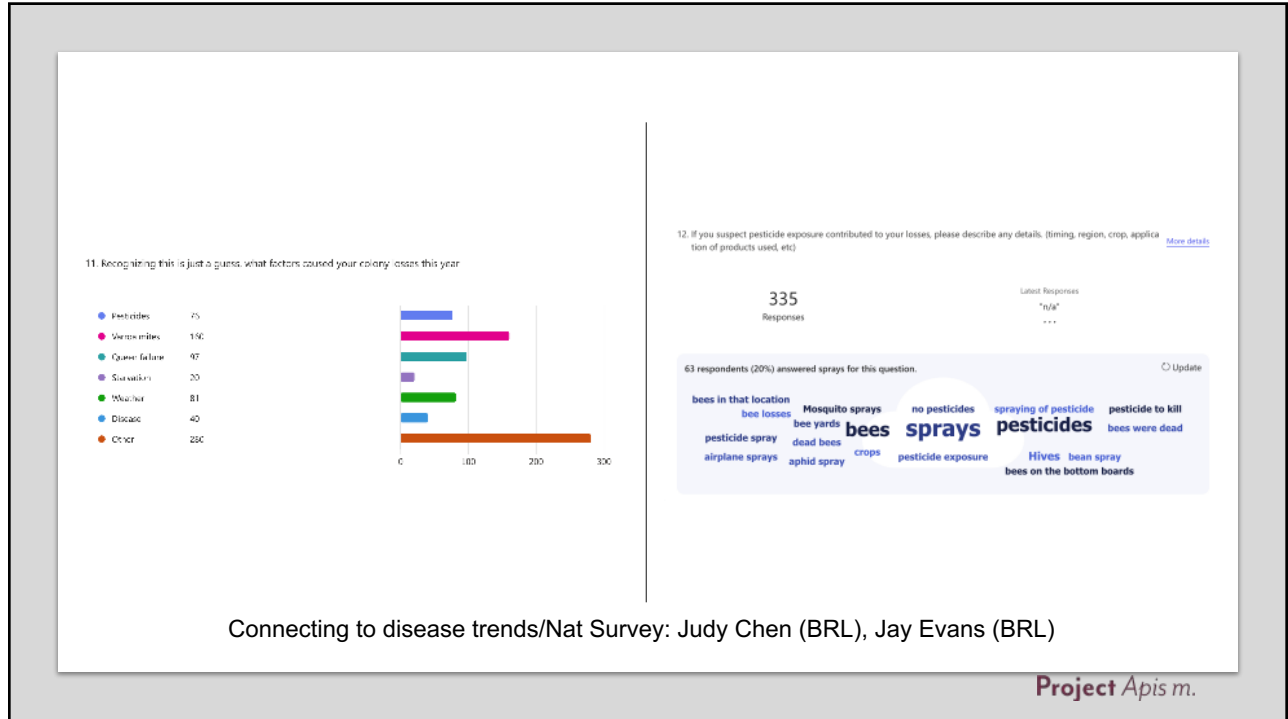
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Mite treatments: Narayanan Kannan (Stoneville), Steve Cook (BRL), Frank Rinkevich (BR)

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8



9

## Second Survey

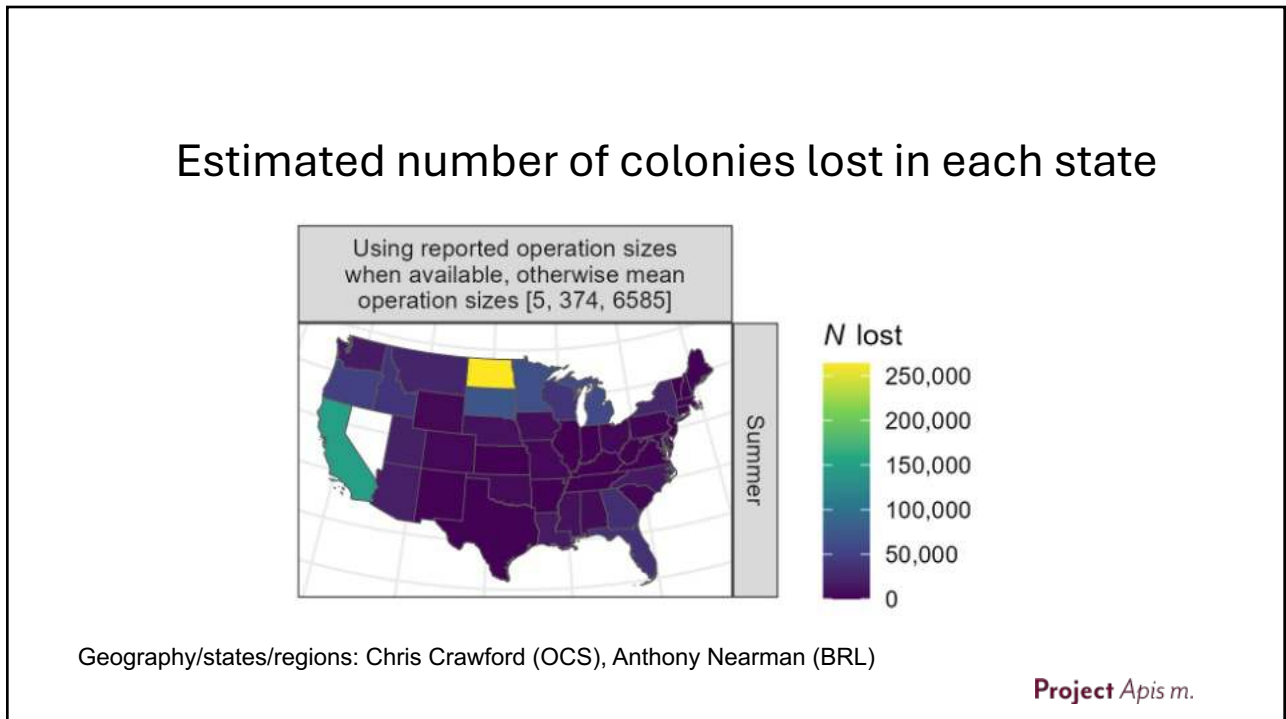
- 97 responses from Commercial/Sideline who consented to be contacted. This allowed us to link data lines, and create averages for these classes to more accurately estimate the losses in Survey #1.
- Colonies in June: 622,176
- Colonies in Feb: 312,883
- Expected to take to almonds: 399,991 (NASS estimate 1.8million 2024)
- Number of colonies short: 84,699 (4 had extra, one tbd)
- NASS estimate of US colonies in June 2024: 2,709,370
- **Estimate of colonies represented in PAm survey: 1,835,000 (68% of US total)**
- **Survey respondents losses are 41% of total US colonies.**

Economics: Izzy Hill (OCS)

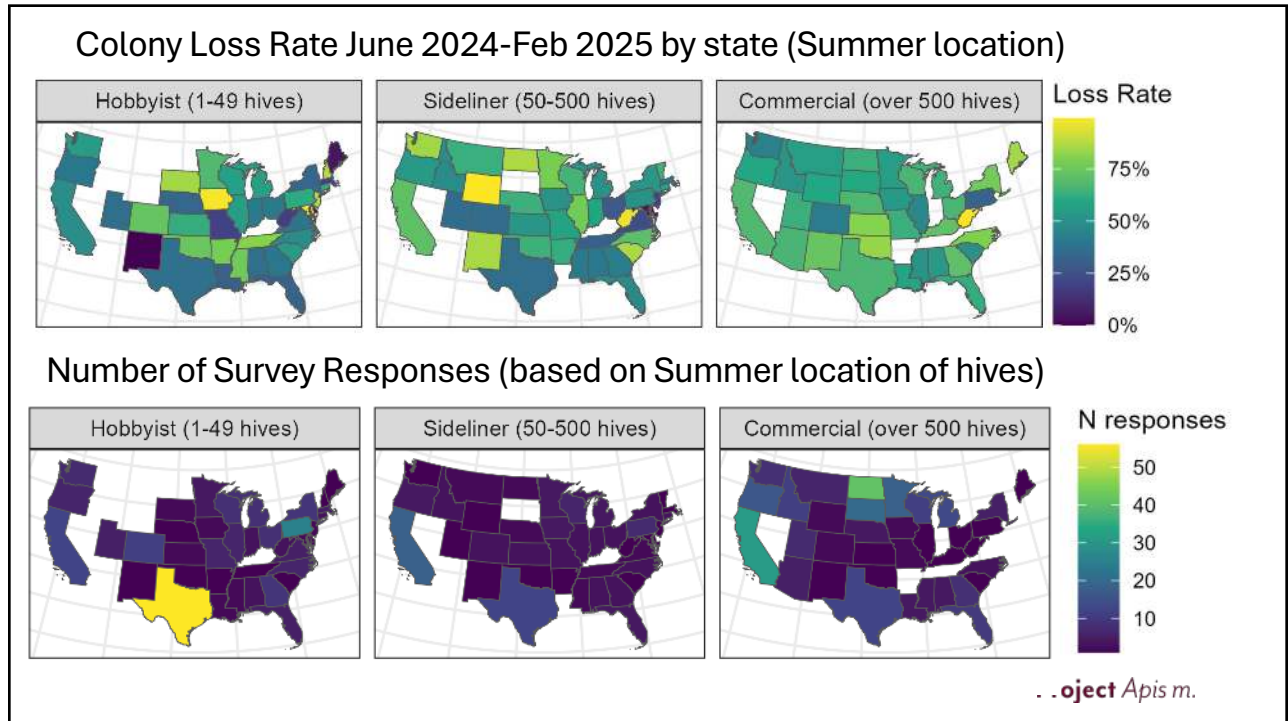
10

| <b>Estimating Total Colony Loss</b> |                       |  |                            |
|-------------------------------------|-----------------------|--|----------------------------|
| <b>Beekeeper Class</b>              | <b>Mean Loss Rate</b> | <b>Using number of colonies reported OR if not reported average colony number was Hobby=5, Sideline=374, Commercial=6585</b> | <b>Number of responses</b> |
| Hobbyist (1-49 hives)               | 50%                   | 717  | 287                        |
| Sideline (50-500 hives)             | 54%                   | 28,282   | 139                        |
| Commercial (over 500 hives)         | 62%                   | 1,094,960  | 270                        |
| Not listed                          | 46%                   | -  | 6                          |
| <b>TOTAL</b>                        |                       | <b>1,123,959</b>   | <b>702</b>                 |

11



12



13

### Commercial (500+ colonies) Total Colony Loss Estimates June 2024- Feb 12, 2025

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| Beekeeper Class             | State (Summer 2024) | Mean Loss Rate | Using reported operation sizes when available, otherwise mean operation size of 6585 colonies | Number of responses |
|-----------------------------|---------------------|----------------|---|---------------------|
| Commercial (over 500 hives) | AL                  | 54%            | 6,373   | 4                   |
| Commercial (over 500 hives) | AZ                  | 66%            | 18,666  | 5                   |
| Commercial (over 500 hives) | CA                  | 68%            | 149,090   | 31                  |
| Commercial (over 500 hives) | CO                  | 42%            | 3,988   | Less than 4         |
| Commercial (over 500 hives) | FL                  | 62%            | 34,938  | 10                  |
| Commercial (over 500 hives) | GA                  | 71%            | 33,518  | 8                   |
| Commercial (over 500 hives) | IA                  | 54%            | 7,105   | Less than 4         |
| Commercial (over 500 hives) | ID                  | 52%            | 38,372  | 11                  |
| Commercial (over 500 hives) | IL                  | 47%            | 515   | Less than 4         |
| Commercial (over 500 hives) | KS                  | 81%            | 485   | Less than 4         |
| Commercial (over 500 hives) | KY                  | 72%            | 468   | Less than 4         |
| Commercial (over 500 hives) | LA                  | 58%            | 15,624  | 4                   |
| Commercial (over 500 hives) | ME                  | 85%            | 1,531   | Less than 4         |
| Commercial (over 500 hives) | MI                  | 64%            | 59,604  | 13                  |
| Commercial (over 500 hives) | MN                  | 56%            | 65,991  | 18                  |
| Commercial (over 500 hives) | MO                  | 63%            | 5,429   | Less than 4         |
| Commercial (over 500 hives) | MS                  | 51%            | 9,509   | 4                   |
| Commercial (over 500 hives) | MT                  | 55%            | 24,328  | 6                   |
| Commercial (over 500 hives) | NC                  | 80%            | 15,793  | Less than 4         |
| Commercial (over 500 hives) | ND                  | 63%            | 263,898   | 41                  |
| Commercial (over 500 hives) | NE                  | 67%            | 9,446   | 4                   |
| Commercial (over 500 hives) | NM                  | 74%            | 962   | Less than 4         |
| Commercial (over 500 hives) | NY                  | 77%            | 25,258  | 5                   |
| Commercial (over 500 hives) | OH                  | 66%            | 4,363   | Less than 4         |
| Commercial (over 500 hives) | OK                  | 83%            | 5,479   | Less than 4         |
| Commercial (over 500 hives) | OR                  | 59%            | 50,170  | 16                  |
| Commercial (over 500 hives) | PA                  | 32%            | 2,137   | Less than 4         |
| Commercial (over 500 hives) | SC                  | 50%            | 3,301   | Less than 4         |
| Commercial (over 500 hives) | SD                  | 60%            | 70,423  | 20                  |
| Commercial (over 500 hives) | TX                  | 67%            | 45,663  | 12                  |
| Commercial (over 500 hives) | UT                  | 63%            | 19,538  | 7                   |
| Commercial (over 500 hives) | WA                  | 43%            | 16,820  | 8                   |
| Commercial (over 500 hives) | WI                  | 66%            | 38,730  | 11                  |
| Commercial (over 500 hives) | WV                  | 99%            | 431   | Less than 4         |
| Commercial (over 500 hives) | WY                  | 59%            | 4,525   | Less than 4         |
| Commercial (over 500 hives) | None listed         | 58%            | 42,490  | 11                  |

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14

**Hobbyist (0-49 colonies) Total Colony Loss Estimates** **Project Apis m.**  
**June 2024- Feb 12, 2025**

| Beekeeper Class       | State (Summer 2024) | Mean Loss Rate | Colonies Lost assuming operation size of 5 |             |
|-----------------------|---------------------|----------------|--|-------------|
|                       |                     |                | Number of responses                        | Less than 4 |
| Hobbyist (1-49 hives) | AL                  | 37%            | 5  | Less than 4 |
| Hobbyist (1-49 hives) | AR                  | 78%            | 4  | Less than 4 |
| Hobbyist (1-49 hives) | CA                  | 49%            | 29   | 12          |
| Hobbyist (1-49 hives) | CO                  | 73%            | 40   | 11          |
| Hobbyist (1-49 hives) | CT                  | 61%            | 9  | Less than 4 |
| Hobbyist (1-49 hives) | DE                  | 0%             | -  | Less than 4 |
| Hobbyist (1-49 hives) | FL                  | 32%            | 8  | 5           |
| Hobbyist (1-49 hives) | GA                  | 39%            | 18   | 9           |
| Hobbyist (1-49 hives) | HI                  | 0%             | -  | Less than 4 |
| Hobbyist (1-49 hives) | IA                  | 98%            | 10   | Less than 4 |
| Hobbyist (1-49 hives) | IL                  | 55%            | 17   | 6           |
| Hobbyist (1-49 hives) | IN                  | 41%            | 6  | Less than 4 |
| Hobbyist (1-49 hives) | KS                  | 62%            | 6  | Less than 4 |
| Hobbyist (1-49 hives) | LA                  | 31%            | 3  | Less than 4 |
| Hobbyist (1-49 hives) | MA                  | 19%            | 5  | 5           |
| Hobbyist (1-49 hives) | MD                  | 99%            | 10   | Less than 4 |
| Hobbyist (1-49 hives) | ME                  | 5%             | 0  | Less than 4 |
| Hobbyist (1-49 hives) | MI                  | 57%            | 23   | 8           |
| Hobbyist (1-49 hives) | MN                  | 68%            | 14   | 4           |
| Hobbyist (1-49 hives) | MO                  | 19%            | 6  | 6           |
| Hobbyist (1-49 hives) | MS                  | 76%            | 8  | Less than 4 |
| Hobbyist (1-49 hives) | NC                  | 48%            | 6  | 14          |
| Hobbyist (1-49 hives) | NE                  | 33%            | 2  | Less than 4 |
| Hobbyist (1-49 hives) | NH                  | 87%            | 4  | Less than 4 |
| Hobbyist (1-49 hives) | NJ                  | 88%            | 9  | Less than 4 |
| Hobbyist (1-49 hives) | NM                  | 0%             | -  | Less than 4 |
| Hobbyist (1-49 hives) | NY                  | 33%            | 15   | 9           |
| Hobbyist (1-49 hives) | OH                  | 41%            | 16   | 8           |
| Hobbyist (1-49 hives) | OK                  | 74%            | 4  | Less than 4 |
| Hobbyist (1-49 hives) | OR                  | 40%            | 6  | 12          |
| Hobbyist (1-49 hives) | PA                  | 61%            | 76   | 25          |
| Hobbyist (1-49 hives) | SC                  | 55%            | 3  | Less than 4 |
| Hobbyist (1-49 hives) | SD                  | 85%            | 9  | Less than 4 |
| Hobbyist (1-49 hives) | TN                  | 81%            | 4  | Less than 4 |
| Hobbyist (1-49 hives) | TX                  | 37%            | 104  | 56          |
| Hobbyist (1-49 hives) | UT                  | 37%            | 9  | 5           |
| Hobbyist (1-49 hives) | VA                  | 39%            | 10   | 5           |
| Hobbyist (1-49 hives) | WA                  | 53%            | 19   | 7           |
| Hobbyist (1-49 hives) | WI                  | 56%            | 23   | 8           |
| Hobbyist (1-49 hives) | WV                  | 18%            | 3  | Less than 4 |
| Hobbyist (1-49 hives) | None listed         | 65%            | 160  | 49          |

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15

**Sidelineer (50-500 colonies) Total Colony Loss Estimates** **Project Apis m.**  
**June 2024- Feb 12, 2025**

| Beekeeper Class           | State (Summer 2024) | Mean Loss Rate | Using reported operation sizes when available, otherwise mean operation size of 374 |             |
|---------------------------|---------------------|----------------|---|-------------|
|                           |                     |                | Number of responses   | Less than 4 |
| Sidelineer (50-500 hives) | AL                  | 40%            | 449   | Less than 4 |
| Sidelineer (50-500 hives) | AR                  | 62%            | 232   | Less than 4 |
| Sidelineer (50-500 hives) | CA                  | 71%            | 4,803   | 18          |
| Sidelineer (50-500 hives) | CO                  | 35%            | 398   | Less than 4 |
| Sidelineer (50-500 hives) | CT                  | 58%            | 656   | Less than 4 |
| Sidelineer (50-500 hives) | FL                  | 48%            | 716   | 4           |
| Sidelineer (50-500 hives) | GA                  | 43%            | 481   | Less than 4 |
| Sidelineer (50-500 hives) | IA                  | 51%            | 756   | 4           |
| Sidelineer (50-500 hives) | ID                  | 48%            | 539   | Less than 4 |
| Sidelineer (50-500 hives) | IL                  | 77%            | 865   | Less than 4 |
| Sidelineer (50-500 hives) | IN                  | 59%            | 666   | Less than 4 |
| Sidelineer (50-500 hives) | KS                  | 52%            | 585   | Less than 4 |
| Sidelineer (50-500 hives) | MA                  | 41%            | 151   | Less than 4 |
| Sidelineer (50-500 hives) | MD                  | 4%             | 15  | Less than 4 |
| Sidelineer (50-500 hives) | MI                  | 51%            | 758   | 4           |
| Sidelineer (50-500 hives) | MN                  | 78%            | 1,170   | 4           |
| Sidelineer (50-500 hives) | MO                  | 58%            | 646   | Less than 4 |
| Sidelineer (50-500 hives) | MS                  | 41%            | 306   | Less than 4 |
| Sidelineer (50-500 hives) | MT                  | 63%            | 471   | Less than 4 |
| Sidelineer (50-500 hives) | NC                  | 70%            | 789   | Less than 4 |
| Sidelineer (50-500 hives) | ND                  | 87%            | 648   | Less than 4 |
| Sidelineer (50-500 hives) | NE                  | 64%            | 475   | Less than 4 |
| Sidelineer (50-500 hives) | NJ                  | 19%            | 72  | Less than 4 |
| Sidelineer (50-500 hives) | NM                  | 86%            | 322   | Less than 4 |
| Sidelineer (50-500 hives) | NY                  | 53%            | 596   | Less than 4 |
| Sidelineer (50-500 hives) | OH                  | 28%            | 314   | Less than 4 |
| Sidelineer (50-500 hives) | OK                  | 63%            | 237   | Less than 4 |
| Sidelineer (50-500 hives) | OR                  | 54%            | 865   | 4           |
| Sidelineer (50-500 hives) | PA                  | 51%            | 1,324   | 7           |
| Sidelineer (50-500 hives) | SC                  | 86%            | 323   | Less than 4 |
| Sidelineer (50-500 hives) | TN                  | 31%            | 234   | Less than 4 |
| Sidelineer (50-500 hives) | TX                  | 36%            | 1,623   | 12          |
| Sidelineer (50-500 hives) | UT                  | 35%            | 132   | Less than 4 |
| Sidelineer (50-500 hives) | VA                  | 24%            | 177   | Less than 4 |
| Sidelineer (50-500 hives) | VT                  | 64%            | 239   | Less than 4 |
| Sidelineer (50-500 hives) | WA                  | 85%            | 317   | Less than 4 |
| Sidelineer (50-500 hives) | WI                  | 65%            | 1,457   | 6           |
| Sidelineer (50-500 hives) | WV                  | 97%            | 361   | Less than 4 |
| Sidelineer (50-500 hives) | WY                  | 99%            | 371   | Less than 4 |
| Sidelineer (50-500 hives) | None listed         | 51%            | 2,651   | 14          |

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16



### Investigating the Causes: USDA-ARS Analyses Underway

In response to the crisis, the U.S. Department of Agriculture's Agricultural Research Service (USDA-ARS) has mobilized researchers to analyze field samples collected from 114 colonies in California, including both failing and surviving colonies. Scientists are conducting a four-tiered investigation to determine potential causes:

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

Additionally, USDA-ARS labs across the are analyzing potential contributing factors, such as:

- **Varroa mite resistance to amitraz**, commonly used to manage Varroa mites.
- **Environmental factors**, including weather conditions affecting colony health.
- **Management factors** such as queen replacement, supplemental nutrition and winter management.
- **Chemical exposures**, including interactions between pesticides and bee immunity.

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17

*The following represents stories we heard from beekeepers. Each story represents multiple operations.*

We put so much money into my business to keep these bees healthy. When we saw mite levels were higher than we liked in the summer, we immediately stopped, harvested honey off the whole operation. Within a week every colony was treated for mites. That was the summer. When the fall was warm and dry, we fed pollen sub to replace what wasn't coming in from the land. we fed everything, and invested into probiotics. We lost 50%, we lost 100%. What is going on? Even if you did nothing you wouldn't lose 100%, would you?

We used to bring medium strength colonies here for the winter. They would build up on natural pollen, and then just before almonds they would be so strong we could split them. Now we bring our strongest colonies here, and they get smaller. What is happening? Our equipment is clean, our wax is new, it's not mites. Now our strong colonies die, when before our medium colonies could recover.

What do back-to-back losses mean? We already bought back in. We borrowed from our house, from our retirement, from family. We borrowed back in to keep the business going. Now those bees are gone. This is what it means to have back to back losses on a farm. We took a large loss two years ago. We borrowed against our long term investments to buy back into bees. We ran our bees again. We focused on their health. We asked for help. We did what we are supposed to do. But when the losses hit again, there is no way to recover. It's all gone. The equity on the house is gone, our retirement is gone, the family member's money is gone. All that's left are empty boxes. We don't even have the dead bees. They are gone too. This is what back to back losses mean for us.

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18