



Preliminary Results from the 2024-2025 US Beekeeping Survey: Honey Bee Colony Loss and Management

Note: This is a preliminary analysis. A final report is being prepared for publication in a peer-reviewed scientific journal at a later date.

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National surveys play a key role in tracking losses of managed *Apis mellifera* honey bee colonies in the United States. A survey led by the Bee Informed Partnership, in collaboration with the University of Maryland, Auburn University, and the Apiary Inspectors of America (AIA) (vanEngelsdorp et al., 2010; Steinhauer et al., 2014; Kulhanek et al., 2017), gathered long-term data between 2007-08 and 2022-23 to track colony losses (e.g. Bruckner et al., 2023; Aurell et al., 2024). Survey results also facilitated identifying trends in regional loss patterns (Overturf et al., 2022) and key risk and protective factors associated with colony health (Seitz et al., 2016; Steinhauer et al., 2021). Importantly, it identified an association between winter losses and *Varroa destructor* control methods (Haber et al., 2019).

Since 2024, Auburn University and the Apiary Inspectors of America (AIA), with support from Oregon State University, have continued to track colony losses and beekeeping practices through a compatible annual national survey focused on managed colony losses and beekeeping practices (Giacobino et al., 2024).

The 2024-2025 survey was accessible on the AIA website (<https://apiaryinspectors.org/US-beekeeping-survey>) to collect beekeepers' responses from April 1 to April 30, 2025; the survey covered the period between April 1, 2024 and April 1, 2025. Two versions of the survey were available: one for small-scale beekeepers managing 50 or fewer colonies, and one for large-scale beekeepers managing more than

50 colonies. Key questions allowed the survey to estimate managed colony loss and to track implementation of key management practices by beekeepers.

A total of 2,453 beekeepers provided valid responses from across the United States. These beekeepers collectively managed 219,097 colonies on October 1, 2024, representing 8.4% of the estimated 2.60 million managed honey-producing colonies in the country in 2024 (USDA NASS, 2025).

Like previous surveys, colony loss rates were calculated as the ratio of the total number of colonies lost and the number of colonies managed at risk over a defined period. Loss rates should not be interpreted as a change in population size, but rather as a mortality rate. High levels of loss do not necessarily result in a decrease in the total number of colonies managed because beekeepers can potentially replace lost colonies during the year. In all cases, losses are reported with 95% confidence intervals (CIs) that were obtained from the distribution of bootstrapped estimates for each group of respondents (n-out-of-n method, 1000 rep.). Due to the stochastic nature of bootstrap analyses, 95% CI would be expected to vary slightly if recalculated.

Over the entire year (April 1, 2024 - April 1, 2025), beekeepers in the United States lost an estimated 55.6% [47.9-61.8 CI] of their managed honey bee colonies (Fig. 1). This is the highest loss rate reported since annual losses were first tracked starting in 2010-2011, and 0.5 percentage point (pp) higher than last year's annual losses, which at the time were the highest ever reported. The losses registered this year are 14.2 pp higher than the running 14-year average annual loss rate of 41.4%.

The losses of managed colonies during summer 2024 (April 1, 2024 - October 1, 2024) were estimated at 28.3% [20.1-35.9] (Fig. 1). This was 2.1 pp lower than last year's losses and 4.9 pp higher than the running 14-year average summer loss of 23.4% that has been reported by beekeepers since the summer of 2010.

During winter 2024-2025 (October 1, 2024 - April 1, 2025), an estimated 40.2% [33.2-46.9 CI] of managed colonies were lost (Fig. 1). This winter loss rate was 10.9 pp higher than the running 17-year average winter loss of 29.3% reported by beekeepers since 2007-2008. The 2024-2025 winter loss rate was the highest recorded since the survey began, exceeding the previous highest loss rate of 37.7% from 2018-2019 by 2.5 pp, as well as last year's winter loss rate of 37.3% by 2.9 pp. The percentage of colony loss that was viewed as "acceptable" by beekeepers over winter during 2024-2025 was 21.7%, consistent with previous years, where the acceptable loss has been stable around 20%. During winter 2024-2025, 42% of the beekeepers surveyed reported winter loss above this threshold.

US Beekeeping Survey

2024-2025 managed colony loss rates added to historic rates

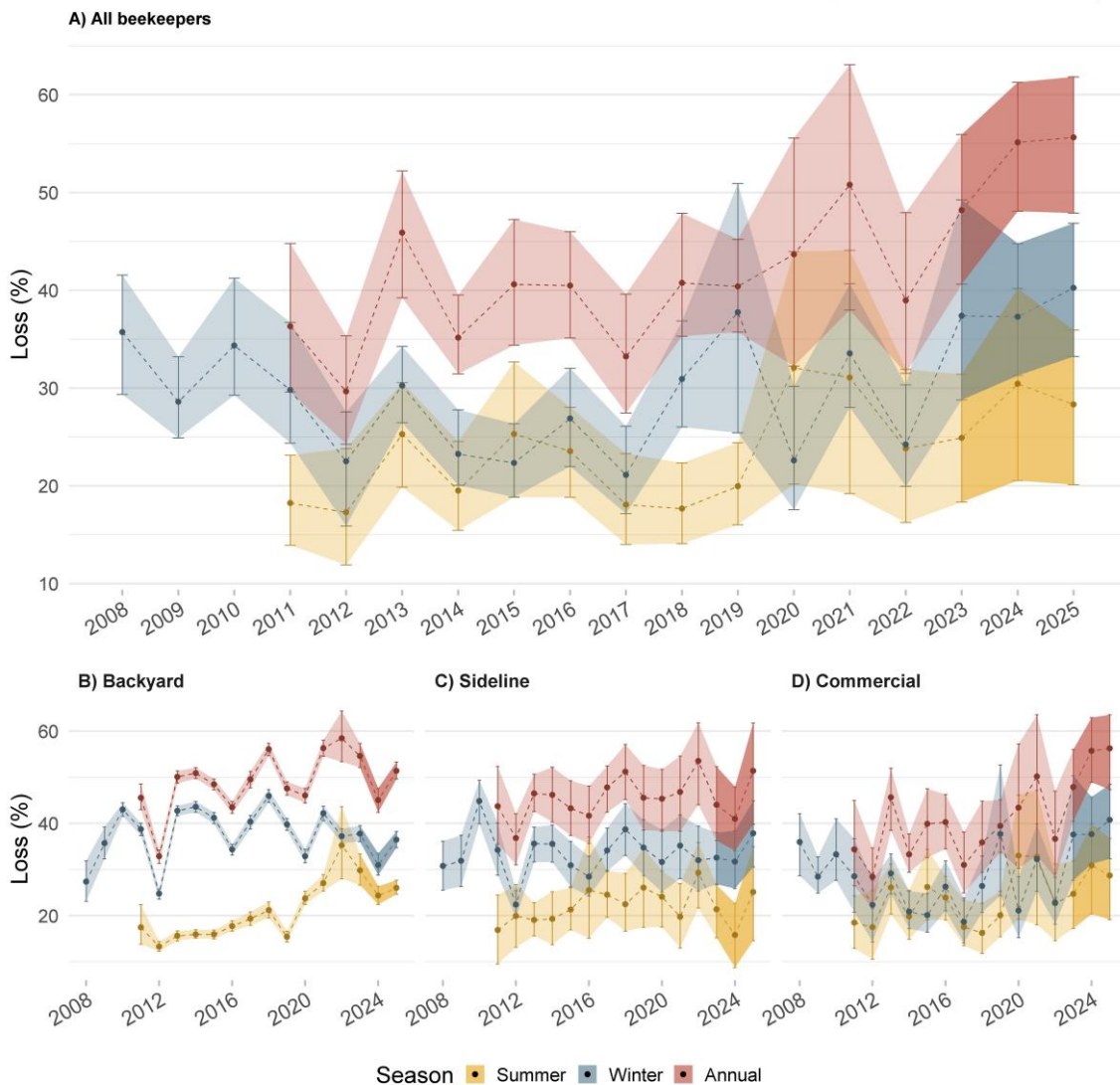


Figure 1. Seasonal managed *Apis mellifera* honey bee colony loss rates (%) in the United States across years (A) and by beekeeper operation type (B-D): backyard (managing up to 50 colonies), sideline (managing 51-500 colonies), and commercial (managing >500 colonies). The loss rate was calculated as the total number of colonies lost divided by the number of colonies at risk during the season. Colonies at risk were composed of living colonies at the start of a defined period, as well as new colonies made or acquired, while excluding colonies sold or parted with. Annual loss covers the whole period from April 1 to the next April 1 (in red); summer (April 1 for backyard or date of the first split reported for sideline and commercial - October 1, in yellow); winter (October 1 - April 1 for backyard or date of the first split reported for sideline and commercial, in blue). Error bars represent the 95% confidence interval obtained from a bootstrap resampling of the data (n-out-of-n, 1000 rep). **Note:** Data shown from 2008 to 2023 were collected and published previously by the Bee Informed Partnership, University of Maryland, and Auburn University (lighter, transparent color).

Losses by operation type for 2024-2025

The honey bee industry in the United States can be loosely divided into three groups of beekeepers: backyard (managing less than 50 colonies), sideline (managing between 51-500 colonies), and commercial (managing more than 500 colonies). Commercial and sideline beekeepers (5.5% of the surveyed beekeepers) collectively managed 92% of surveyed colonies in 2024-2025, whereas backyard beekeepers (94.5% of the surveyed beekeepers) collectively managed the remaining 8% of surveyed colonies in the 2024-2025 survey.

We observed the same trend as last year, which differed from all prior years: during 2024-2025, backyard beekeepers experienced a lower annual colony loss rate (51.4% [49.6-53.2 CI]) compared to commercial beekeepers (56.2% [47.3-63.6 CI]). However, annual losses among backyard beekeepers increased by 6.3 pp compared to the previous year, whereas losses among commercial beekeepers increased by only 0.5 pp. Considering the 14-year average, results from 2024-2025 represented a higher loss year for both operation types (2.5 pp more than the average of 48.9% for backyard and 16.1 pp more than the average of 40.1% for commercial).

During summer 2024, backyard beekeepers experienced an estimated loss of 26.0% [24.6-27.6 CI], which was 1.6 pp higher than last year's losses and 5.1 pp higher than their 14-year average summer loss of 20.9%. Meanwhile, commercial beekeepers experienced an estimated loss of 28.7% [19.2-36.8 CI], which was 2.2 pp lower than last year's losses but 5.1 pp higher than their 14-year average summer loss of 23.6%.

For the second year in a row, and opposite to the first 15 years of survey data, loss rates for winter 2024-2025 were higher for commercial beekeepers than for backyard beekeepers. Backyard beekeepers experienced an estimated loss of 36.5% [34.7-38.2 CI], which was 1 pp lower than their running 17-year winter loss of 37.5%. Commercial beekeepers experienced an estimated loss of 40.7% (32.3-48.4 CI), which was 12.5 pp over their running 17-year average winter loss of 28.2%. The winter 2024-2025 loss rate for commercial beekeepers was the highest on record since monitoring began in 2007-2008, representing a 3 pp increase over the previous highest loss rate of 37.7%, which was reported in 2018-2019.

Losses by state for 2024-2025

We estimated loss rates for each individual state, territory, and district by including all beekeepers who reported managing colonies in each political entity during the survey year (whether that beekeeper operated in a single state or in multiple states). Multi-state

operations are also represented as a separate subgroup (MSO) in the hex maps below (Fig. 2). An interactive web map displays colony losses by state for the three time periods, Annual, Summer, and Winter (<https://aub.ie/lms2025>).

Annual state-level colony losses in 2024-2025 ranged from 34.3% to 90.5%, with both the minimum and maximum values noticeably higher than those reported in the previous year (2023-2024: 17.7% to 76.2%). The median state-level loss for 2024-2025 was 53.01%, with a variance of 163.11. In comparison, the 2023-2024 median was lower at 47.31%, and the variance slightly higher at 185.04. These results suggest a trend toward higher losses in 2025, with states, on average, experiencing greater colony losses compared to the previous year, while the overall variability in losses across states remained relatively consistent.

Summer losses ranged from 10.8% to 62.7%, showing a higher minimum but a similar maximum relative to last year (2023-2024: 7.9-63.7%). Winter losses ranged from 13.6% to 76.6%, again showing increases in both minimum and maximum values compared to the previous year (2023-2024: 9.3-70.1%). It is important to note that the number of respondents varied across states and must be considered when comparing different state loss estimates. Loss estimates for territories were not reported due to a low number of beekeeper responses. The MSO reported 57.4% annual losses for 2024-2025, very close to the previous year's losses of 57.7%. Summer losses for MSO were 29.5%, slightly lower than last summer's losses of 33.6%, while winter losses reached 41.6%; this was slightly higher than the 38.0% reported the previous winter (Fig. 2).

US Beekeeping Survey

2024-2025 managed colony loss rates

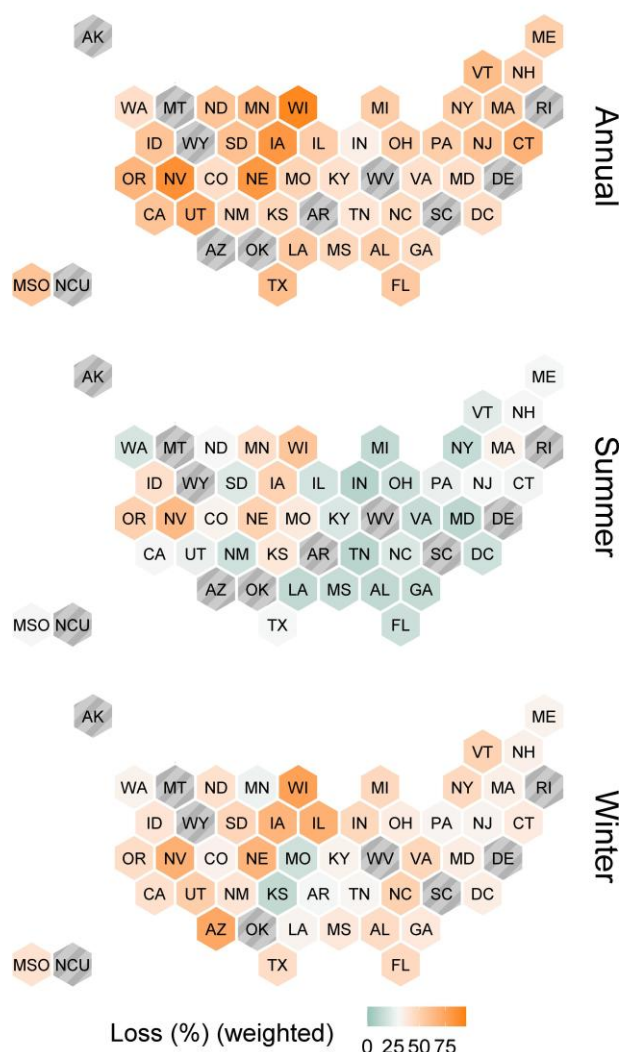


Figure 2. Colony loss rates (%) of managed *Apis mellifera* honey bee colonies in states, territories, and districts of the United States during 2024-2025. Green and orange colors represent loss rates below and above 30%, respectively. The greyed panels indicate states and territories that had their results redacted because they had fewer than 10 valid respondents. NCU: non-continental U.S. (redacted); MSO: multi-state operation; MSO were counted in each state in which they reported keeping colonies but were also reported as a separate subgroup.

Conclusions

Our estimates indicate that U.S. beekeeping operations lost more colonies during the 2024-2025 season than in any other year on record. This year's elevated annual losses appear to be primarily driven by winter losses, which exceeded the historical average by more than 10 pp, especially in commercial operations. In addition, both backyard and commercial beekeepers consistently experienced higher winter losses compared to the

previous year. In contrast, summer losses were lower than last year but remained above the historical average. However, trends differed by operation type during this seasonal period: backyard beekeepers reported increased summer losses relative to the previous year, while commercial operations experienced a slight decline.

Overall, these results suggest that annual colony loss rates continue to rise, placing growing pressure on the beekeeping industry to maintain the national honey bee population at a stable level (~2.6 million colonies, according to USDA NASS Honey Reports). This ongoing trend presents an increasing challenge to meeting the demand for crop pollination and honey production in the U.S.

For more information about the survey, including access to downloadable figures and interactive maps, go to: <https://apiaryinspectors.org/US-beekeeping-survey-24-25>

The 2024-2025 US Beekeeping Survey is supported by the One Hive Foundation, Project Apis m., the National Honey Board, the North Dakota Department of Agriculture, the American Beekeeping Federation, and the American Honey Producers Association.



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