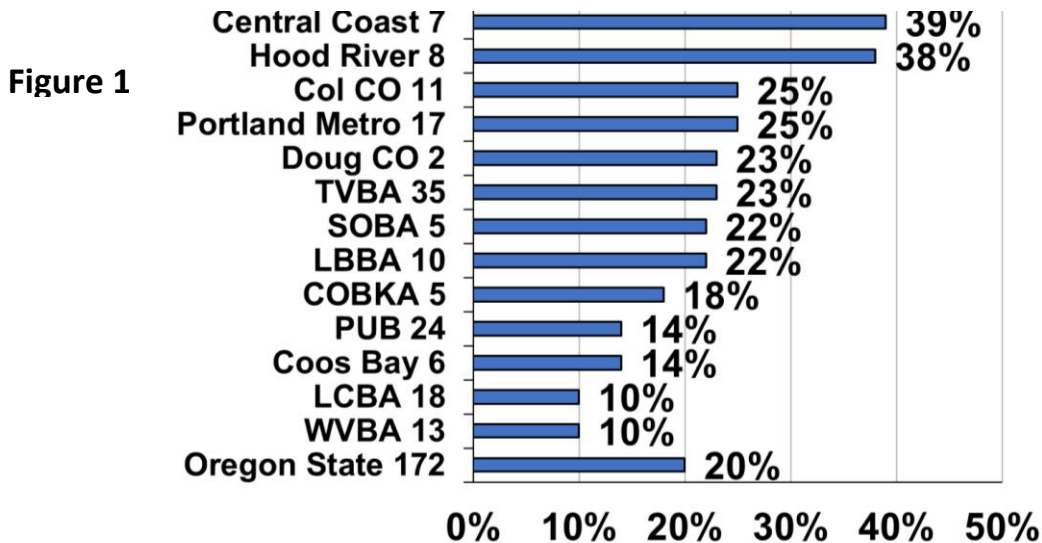


2023-24 PUB Winter Loss by Dewey M. Caron and Jenai Fitzpatrick

For the past 15 years, PNW winter colony losses and several managements related to bee health were solicited with an electronic honey bee survey instrument developed within the PUB bee group www.pnwhoneybeesurvey.com. A total of 171 survey responses were received, only about half the average 305 OR of last 5 years. During the 2022-2023 overwintering period, 24 PUB member surveys were returned, only half of the previous response rate of last three years.



Overwintering losses of small-scale Oregon backyard beekeepers was 20%, the lowest level of my 15 years of surveying winter losses. Average 15 year loss statewide is 36.7%. Average overwintering losses of PUB respondents was 14%, about ½ the loss level of the past two years. This is the third year in a row losses have been below 30% overwinter.

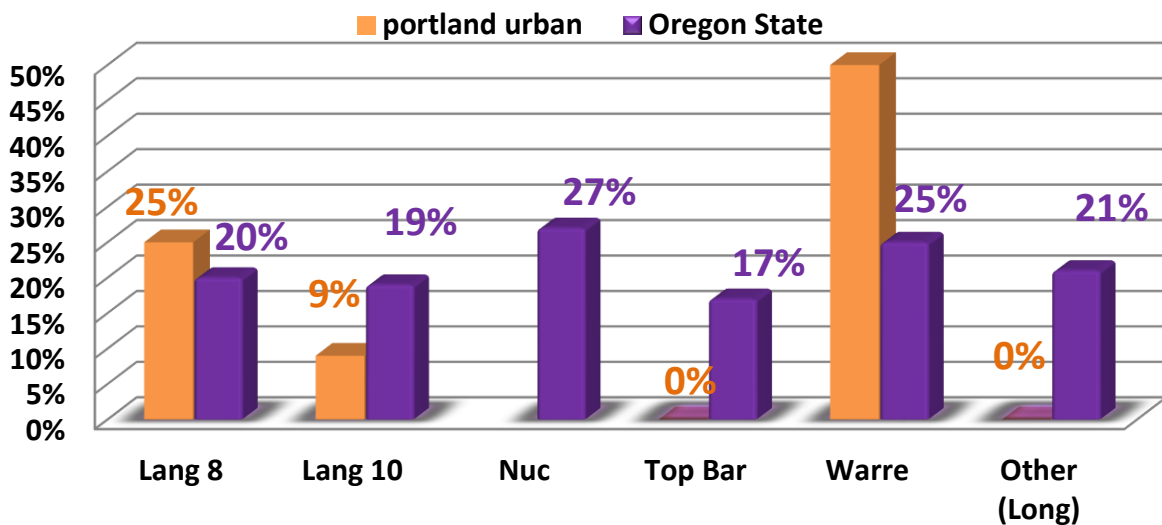
Overwinter losses of members of different organizations varied from a low of 10% for the 31 Willamette Valley and Lane Co beekeeper respondents to a high of 38.5% for the 15 Central Coast and Hood River members. The 4X range of losses was the same as two years ago but less than the previous year (3X difference). Colony numbers ranged from 1 to 41 colonies in Oregon (average 5.7 colonies same as last year; medium number = 4 colonies, also same as last year). For PUB, average number of colonies of respondents was 3.5 colonies with 2 the medium (and most common) number; 8 was the largest number.

PUB losses, reporting on 87 fall hives, showed higher losses of 8-frame (25%) compared to 10-frame (9%) Langstroth hives. For the past eight years losses of 8 frame hives are exactly the same at 38% so 8-frame hive losses were reduced this year in accord with overall losses being lower. No nucs were reported. Nuc losses are typically higher (8-year statewide average= 49%). The four Top bar hives reported by PUB members all survived; two of four Warré hives were lost. PUB member holdings of Top bar and Warré hives two years ago (2020-21) were one half of the total 70 TB and Warré colonies statewide but only 2% of total last year; this year 8 of

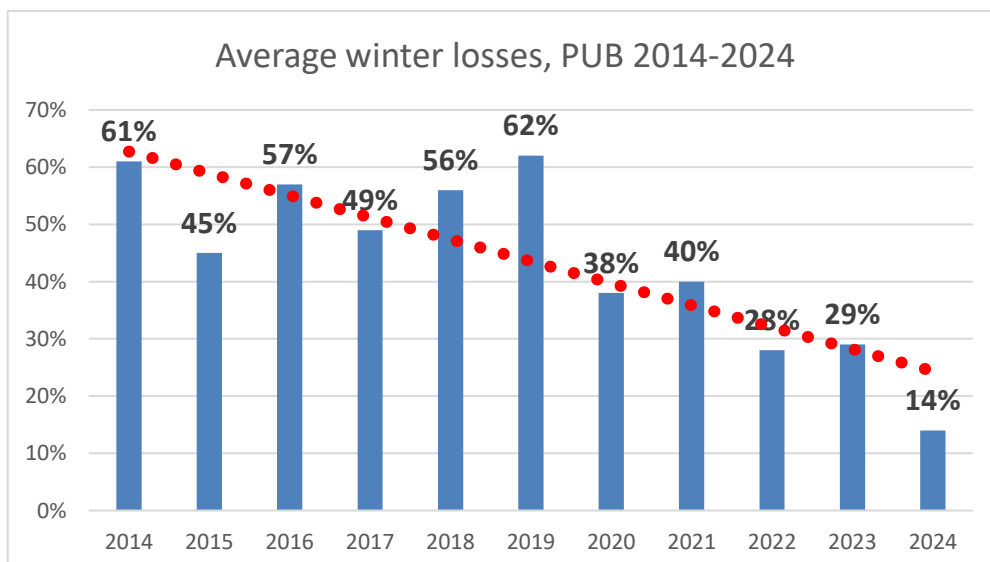
36 total statewide (22%) were managed by PUB members. Warre hive losses of 50% (2 of 4 total) was double the statewide loss level of 25%. Statewide the past 8-year loss averages have been 50% for Top Bar and 41% for Warré hives. There were no losses of 8 long hives and 1 tree hive (the other category). Total loss of all hive types was 12. Loss of PUB members alongside statewide loss is shown in Figure 2.

Figure 2

Winter hive loss by hive type 2023-24

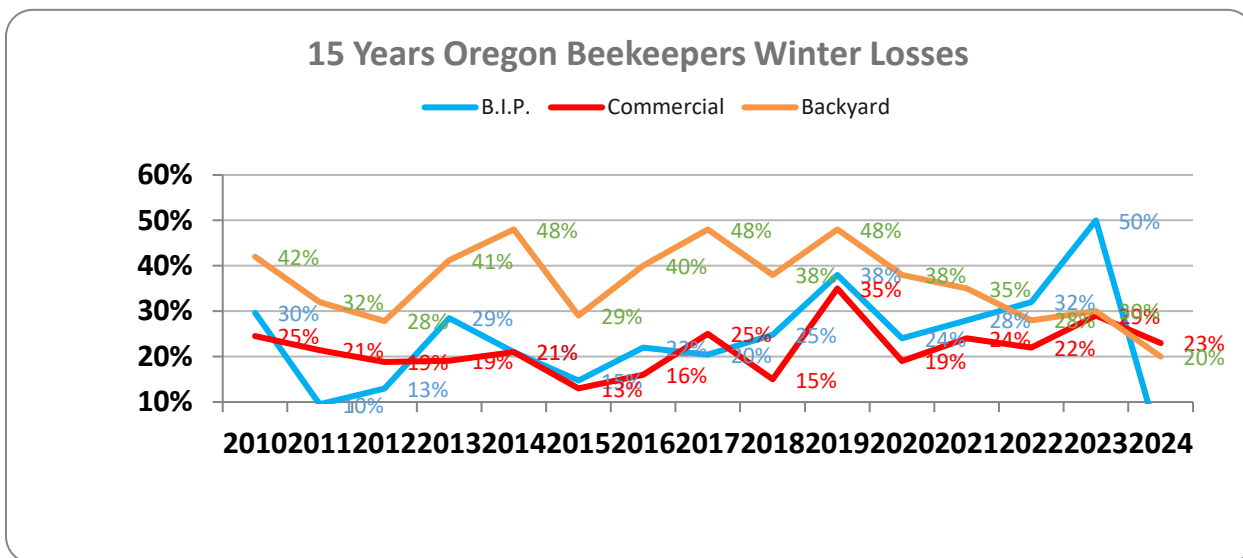


The two figures below illustrate the loss levels of PUB respondents. The bar graph (Figure 3) shows the loss level for past 11 years. The red dotted line is the trend line. Obviously, losses are trending in the right direction. Average backyard losses for last 11 years of Oregon backyarders is 40.3%; for PUB members it is 43.5%, 3 percentage points higher. For comparison the average 11-year loss average for OR Commercial beekeepers (50+ colonies) is 23.6%.



The numbers for current year are early returns of 4 commercial and 3 sideliner beekeepers (total colony number fall=13,000) and 3 sideliner beekeepers (449 colonies). Commercial loss rate is 23.5% and sideliner is 16%. Fifteen-year average Backyard losses =36.7% loss and 15-year commercial/semi-commercial loss = 21.7%. The BeeInformed average=23.7.

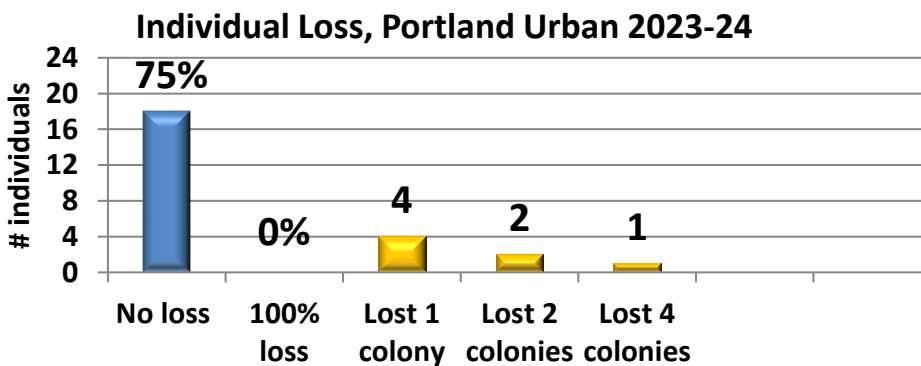
Figure 4



The survey also asked for **loss by hive origination**. Overwintered colonies had the best survival in PUB (3% loss) and statewide (20%). No colonies from nuc origination were lost and similar to statewide colonies originating from packages (1 in 4 lost – 25%) did the worst. Colonies from swarms, splits and feral transfers lost only a single colony each.

Not all individuals had loss. Eighteen individuals (75%) had total survival, i.e., no colonies lost; no beekeepers lost 100% of fall hive number. Heaviest loss was 80% (4 of five colonies). Greatest number loss was one colony (4 individuals). See Figure 5.

Figure 5



Typical of the statewide data, the PUB respondents are **largely beekeepers with few colonies**. 30% of PUB respondents had 1, 3 or 3 fall colonies (3.6 was average number and 5 was median number) with a 25% loss level, another 49% had 4 to 6 colonies, loss 0 and four had 7 or 8 colonies with 10% loss. This relationship of individuals with increasing colony numbers having, on average, lower losses has been constant every survey year

PUB survey respondents reported one to eight years **beekeeping experience**. Three individuals had one year experience (they had 75% loss), 2 individuals had two and 2 more had 3 years experience; the 7 (29% having 1 to 3 years experience) had a 25% loss. Eleven individuals had 4 to 6 years experience (5 was median number) with 0 loss, and 4 individuals had 7 or 8 years experience with 12.5% loss. As years of experience increased generally loss level fell statewide, a bit less so for PUB respondents. Twenty-one of 24 PUB respondents (87.5%) said they had a mentor available as they were learning beekeeping; last year 67% said they had such a mentor.

Four individuals had 2 apiary sites. Loss levels were exactly the same. None said they moved hives.

Reasons for Colony Loss/Acceptable loss

We asked the 6 individuals that had colony loss to estimate what the reason might have been for their loss (multiple responses were permitted – recall that 18 individuals had no loss). Two said queen issues, varroa and weak in fall and 1 said yellow jackets. When asked about an acceptable loss, six said none, 2 said 5%, 1 said 10%, 1 said 15%, 6 said 20% (the median) and another 7 said 25% or more. was an acceptable loss level.

Why do colonies die?

There is no easy way to verify reason(s) for colony loss. Colonies in the same apiary may die for different reasons. Examination of dead colonies is often confusing, some options may be ruled out, we are often left with two or more possible reasons for losses. There is a good deal of variance in opinion as to what might be an acceptable loss level. We are dealing with living animals which are constantly exposed to many different challenges, both in the natural environment and the beekeeper's apiary. Our acceptable loss level has crept upwards over time.

Major factors in colony loss are thought to be mites and their enhancement of viruses, especially DWV (deformed wing virus, plus declining nutritional adequacy/forage and diseases. Pesticides in the agricultural environment weakens colonies. Yellow jacket predation is a constant challenge to weaker fall colonies, Management, especially learning proper bee care in the first years of beekeeping, remains a factor in losses. What effects our changing

environment, such as global warming, contrails, electromagnetic forces, including human disruption of it, human alteration to the bee's natural environment and other factors, play in colony losses are not at all clear.

There is no simple answer to explain the levels of current losses nor is it possible to demonstrate that they are necessarily excessive for all the issues currently facing honey bees. Varroa mites and the viruses they transmit are considered a major factor why colonies are not as healthy as they should be.

Managements

We asked in the survey for information about some managements practiced by respondents. The survey inquired about feeding practices, wintering preparations, sanitation measures utilized, screen bottom board usage, mite monitoring, both non-chemical and chemical mite control techniques and queens. Respondents could select multiple options and there was always a none and other selection possible. This analysis seeks to compare responses of this past season to previous survey years. This analysis takes longer. Results will be posted when available.

Closing comments

This survey was originally designed to 'ground truth' the larger, national Bee Informed loss survey. See statewide PNW reports for OR and WA for this comparison (figure 5 of that report). The numbers while slightly different do in fact track well. Unfortunately, the national BIP survey was discontinued after 2023. See the BeeInformed website www.beeinformed.org for additional information and are encouraged to examine that data base as well. The BeeInformed survey is measuring the larger scale OR beekeepers not the backyarders as loss rates are of total colony number. Reports for individual bee groups are customized and only available from the PNW website; they are posted for previous years.

I intend to continue to refine this instrument each season and hope you will join in response next April. If you would like a reminder when survey is open please email us at info@pnwhoneybeesurvey.com with "REMINDER" in the subject line. I have a blog on the pnwhoneybeesurvey.com and will respond to any questions or concerns you might have. Email me directly for quicker response. dmcaron@udel.edu

Thank You to all who participated. If you find any of this information of value please consider adding your voice to the survey in a subsequent season.

Dewey Caron with Jenai Fitzpatrick, July 2022

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