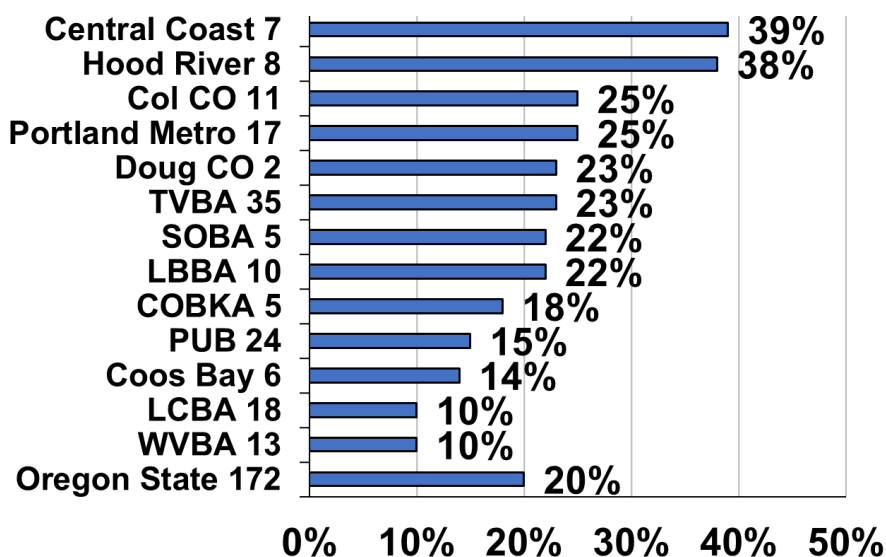


Winter Bee Losses of Oregon Backyard Beekeepers for 2023-2024

by Dewey M. Caron

Overwintering losses of small-scale Oregon backyard beekeepers decreased dramatically to 20% this winter the lowest percentage loss in 15 years of Oregon hobbyist/backyard beekeeper surveys. This annual survey: www.pnwhoneybeesurvey.com. Herein we discuss the data provided by 171 Oregon beekeepers, only 2/3rds of the number last year and well below the previous 5-year average of 305 respondents. Results of the 121 Washington respondents completing surveys (the average response rate of last few years) are included in a separate loss report. Washington average loss was 31%, also the lowest ever reported.



2023 -24 State/Club Losses

Club results of 13 local Oregon associations are shown in Figure 1. 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). The number of respondent individuals are listed next to the association name. The bar length is the average club loss percentage for the year.

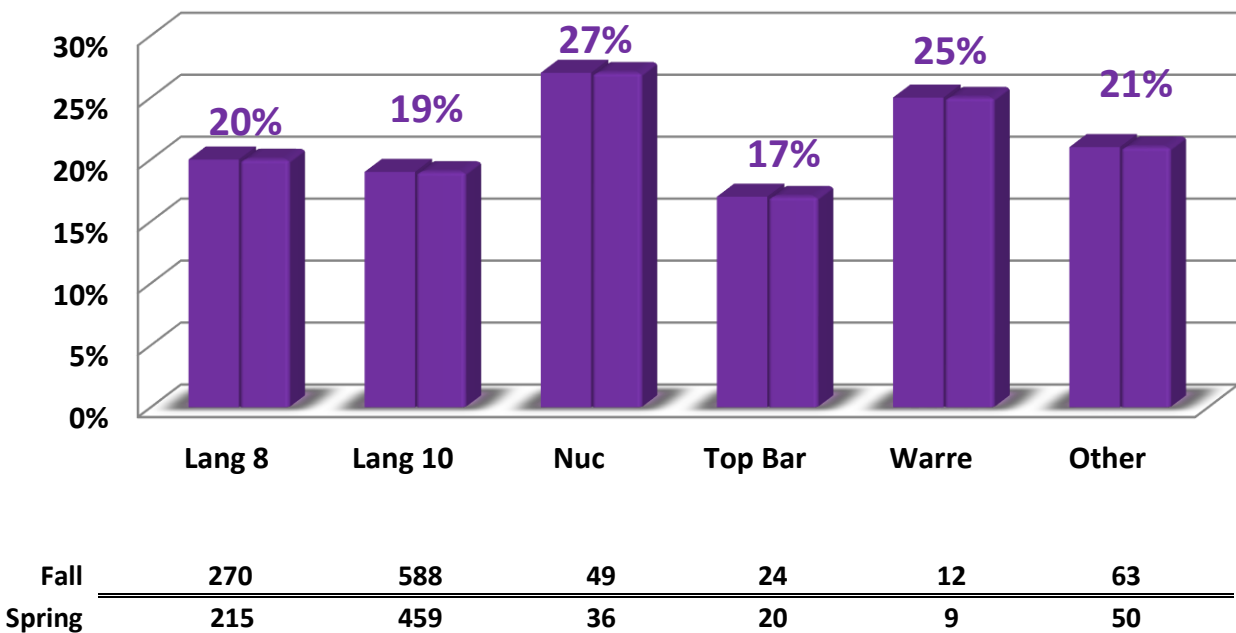
Overwinter losses of members of different organizations varied from a low of 10% for the 31 Willamette Valley and Lane Co beekeeper respondents to a high of 39% for the 7 Central Coast members. The 4X range of losses was the same as two years but less than the previous year (3X difference). Approximately 80% of respondents are roughly along the I-5 corridor between California and Washington.

2023-2024 Overwinter Losses by Hive Type

The loss statistic was developed by asking number of fall colonies and surviving number in the spring by hive type. Respondents had 988 fall hives (345 fewer of the respondent number last year) of which 788 survived to spring (200 lost), equating to a 20% loss (80% survival rate). This was 10 percentage points greater survival over the previous winter loss rate. Ninety-seven percent of hives were 8-frame or 10-frame Langstroth hives, nucs or (49) long hives. There were 49 fall nucs (27% loss rate). Among non-traditional hive types were 24 top bar hives (17% loss) and 12 Warré hives (25% loss). Other hive types in addition to long hives included Layens, log, Apamaye, pagoda and Slovenian.

The winter losses of PNW 8-frame Langstroth hives was a single percentage point greater compared to the loss rate of 10-frame Langstroth hives. The loss rates of Langstroth 8 and 10 frame hives over the past 8 years has averaged 36% for 8-frame Langstroth hives and 40% loss for 10-frame hives respectively but the last 2 years the losses have been within a single percentage point of each other. Nuc losses are typically higher than losses of 8 or 10-frame Langstroth hives, this year 7 percentage point greater. The Nuc 9-year average loss is 43%. This year's Top Bar hive loss of four colonies (17%) is below the 9-year average top bar hive loss of 48%. The 2023 Warré hive loss rate of 25% is below the 8-year average of 41%.

Winter loss by Hive type 2023-24

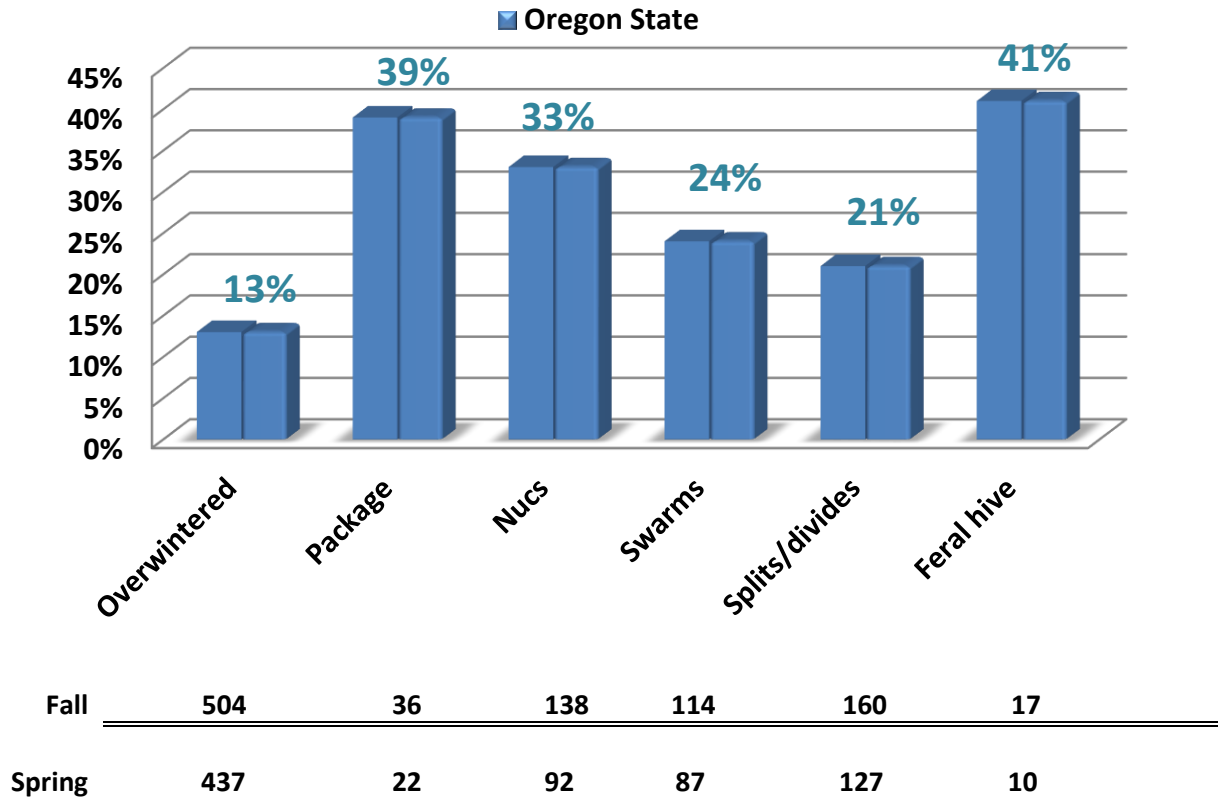


2023-2024 Loses Based on Hive Origination

We also asked survey respondents to characterize their loss by hive origination. The result is graphically presented below. Overwintered colonies obviously had the best survival (13%) with the 160 splits/divides and 1114 swarms also with excellent survival. Packages (39% loss) and nucs (33%) were

higher with package bee survivals exhibiting triple the loss rate of the overwintered colonies. The origination loss percentages are relatively the same each year. This season overwintered colonies had survival rate much better than most winters.

Winter Loss rate by Origination 2023-24



2023 -24 Individual Hive Losses

Forty-seven percent (81 individuals) of Oregon respondents had NO LOSS overwinter (total of 366 colonies), an increase of 11 1/2 percentage points compared to last year. One quarter of that number, 12% (20 individuals – 40 colonies) lost 100% of fall colonies. Figure 4 below shows loss of individuals. The loss of a single colony (by 41 individuals) represents 45.5% of total individuals reporting loss. Four individuals (4.5%) lost seven or more colonies. The highest loss by a single beekeeper was 14 colonies. Loss numbers are reflective of the fact that the median number of bee colonies of backyarders was four colonies. Of 200 colonies lost in Oregon, individuals with 1, 2 or 3 colonies lost 57 colonies, 34%; individuals with 4 to 6 colonies (216 total colonies) lost 22%. Individuals with six or fewer colonies lost 27.5% of their colonies. The 39 individuals with 7 or more colonies lost 36.5% of their colonies while individuals with 10+ colony numbers lost ½ that level – 14.5% of their colonies.

The 20 Individuals who had 12 to 41 colonies lost 57 total colonies. These individuals lost anywhere from 1 to 12 colonies; 8 individuals with 12 or more colonies lost no colonies. This group lost a one-quarter fewer colonies (15%) than the overall statewide group (20%) and slightly less than ½ of individuals with 1-3 colonies (34% loss average).

Survey respondents are primarily small colony number beekeepers – 47% had 1-3 colonies but they vary considerably in their years of beekeeping experience. Looking at losses by colony holding numbers, the 81 individuals who had 1-3 colonies had 34% loss level, the 46 individuals with 4-6 fall colonies (27% of individuals) had a 22% loss level, the 19 individuals with 7-9 fall colonies (20% of individuals) had a 14% loss level and the 20 individuals with 10+ colonies (12% of respondents) lost 21% of their colonies. Numbers are close to those of last year.

By years of experience, the 56 individuals who had 1 to 3 years bee experience (33% of total respondents) had 27% colony loss level and the 49 individuals with 4-6 years experience (29% of

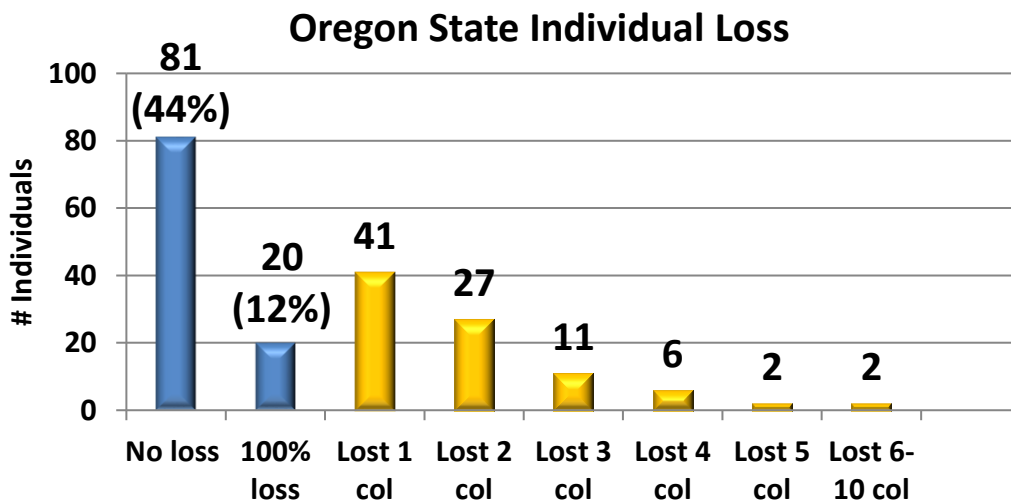


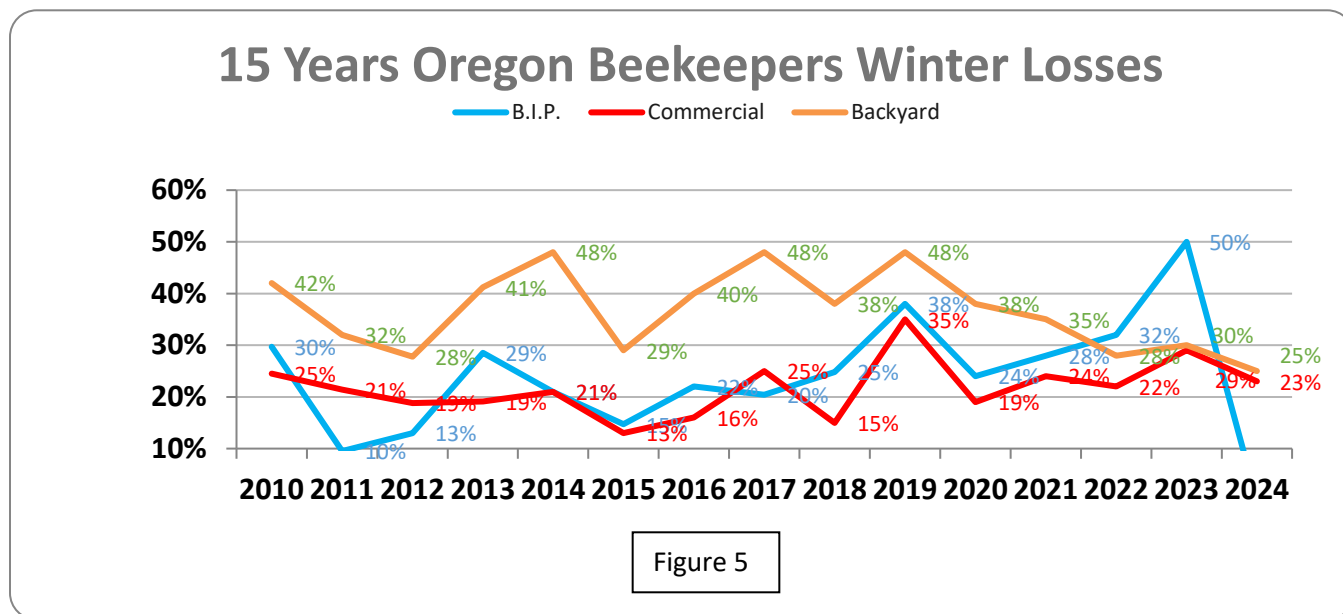
Figure 4

survey takers) had a 19% loss level. Individuals with 6 or fewer years experience, 60% of total respondent number, had 22% loss level. The 27 individuals with 7-9 years experience (16% of respondents) had a 14.5% loss level and those 40 individuals (23% of respondents) with 10+ years experience had a 20.5% loss level. Thus the 40% of survey respondents with 7 or more years experience had an 18.5% loss level. As colony numbers or years experience increase the percent loss level decreases.

Overwinter Losses the Past 14 Seasons

Comparison of the annual losses of backyarders with commercials is shown in Figure 7. The commercial losses are obtained from a different paper survey distributed by Oregon State University.

The numbers for current year are early returns of 4 commercial and 3 sideliner beekeepers (total colony number fall=13,538 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 BeelInformed average=23.7.



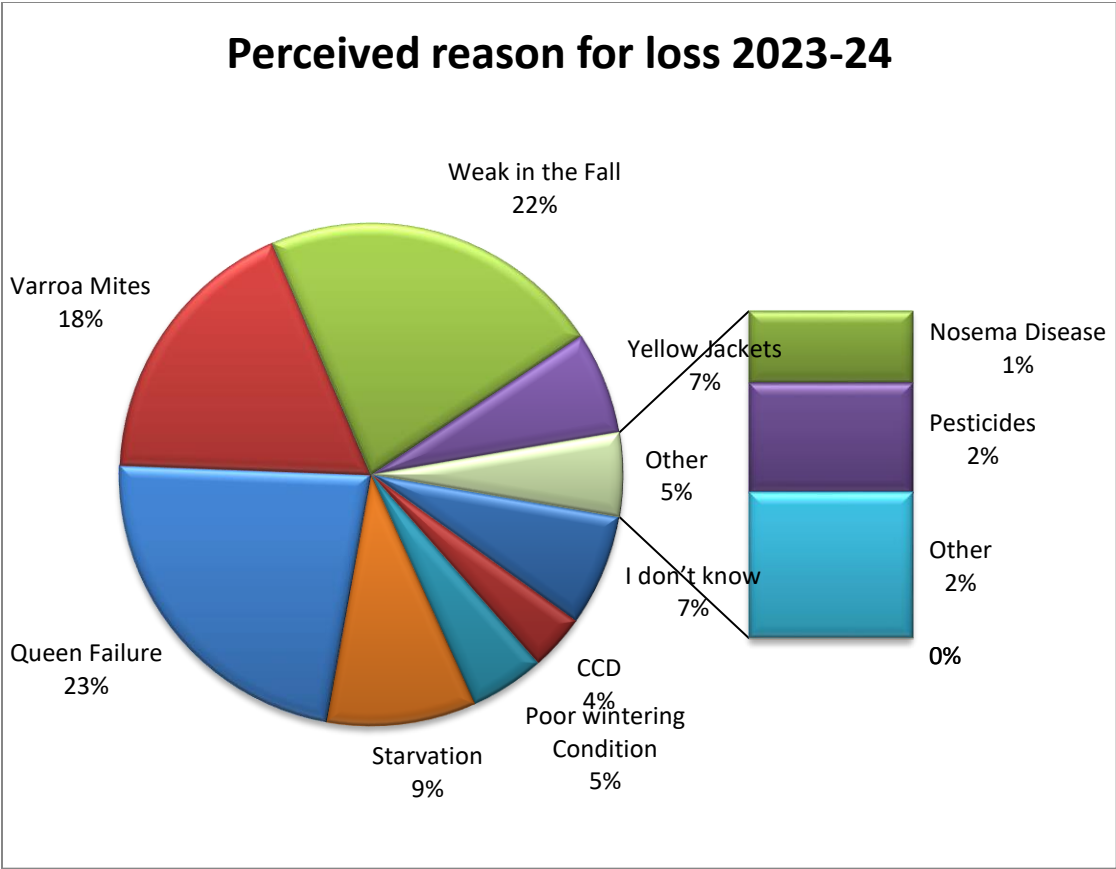
Some Other Numbers

Twenty-five individuals (15%) had more than a single apiary location. The loss level at 2nd apiary was higher in seven instances but also was lower at original site in same number of instances. Seventy-seven percent (77%) of respondents (3% above last year) said they had a mentor available as they were learning beekeeping. Fifty-four individuals (31%) had more than one hive type. And, finally, 10 individuals (6%) moved their bees. One move was sale/gifting of hives, one was due to owner move, one was due to conflict with neighbor, two were for better site, one move was due to bear attack and four were for pollination of crops. Distances were within same property up to miles away (for relocation and pollination).

Perceived Colony Death Reason and Acceptable Level

The survey asked individuals that had colony loss (81 individuals had no loss) to estimate what the reason might have been for their loss (multiple responses were permitted). There were 167 total listings, 1.85/individual. Queen issues (38), weak in the fall (31) and varroa (30 individuals) were most common. Starvation, 16 selections and yellow jackets, 11 respondent choices, along with don't know (12 selections) were 3 additional double-digit choices. Among other one indicated extreme cold and rain, another cited lack of attention, one said pigs knocked hive over and another that wind blew cover off exposing the bees. See Figure 6 graph below.

Figure 6



Acceptable loss: Survey respondents were asked reason for loss. Twenty-three (14%) indicated zero (no loss). Thirty-eight percent of individuals indicated 15% or less; 20% was medium choice, as has been case for several years. The most common response was 25%. Thirteen percent said 50% or greater was an acceptable loss level; one said 75 and 2 said 100% loss levels acceptable. See table below.

Oregon State during 2023-24											
Loss level	5%	10%	15%	20%	25%	33%	50%	75%	100%	None	Other
#	5	31	12	27	31	16	20	1	2	23	0
%	3%	18%	7%	16%	18%	9%	12%	1%	1%	14%	

Why colonies die?

There is no easy way to verify reason(s) for colony loss. Colonies in the same apiary may die for several reasons. Examination of dead colonies is at best confusing and, although some options may be ruled out, we are often left with two or more possible reasons for losses. A dead colony necropsy can be of use. Opinions vary 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. Individual choices varied from zero to 100%, with medium of 20%.

The major factor in colony loss is thought to be mites and their enhancement of viruses especially DWV (deformed wing virus), VDV (Varroa destructor Virus (also termed DWV B) and Israeli and chronic paralysis virus. But we do not have a test for these viruses. It was interesting in that queen problems were the most frequently indicated as were weak in the fall as leading reasons for loss.

Declining nutritional adequacy/forage and diseases, especially at certain apiary sites, are additional factors resulting in poor bee health. Yellow jacket predation is a constant danger 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 them, 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 our honey bees face in the environment. It was encouraging to see from survey responses that losses this past year 30% were still at a low level. More attention to colony strength and possibility of mitigating winter starvation will help reduce some of the losses. Effectively controlling varroa mites will help reduce losses.

Colony 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.

TO BE CONTINUED: It will take longer to do this analysis. Results will be posted as soon as possible.

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 (graph 5 in this 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 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 May 2024