

Winter Bee Losses of Washington Backyard Beekeepers for 2021-2022

by Dewey M. Caron

Overwintering losses of small-scale Washington backyard beekeepers decreased this past winter, dipping 14 percentage point below the 6-year loss average. Eighty Washington respondents completed a survey, 83 fewer than last year. Information on winter losses and several managements related to bee health was included on the electronic honey bee survey instrument www.pnwhoneybeesurvey.com.

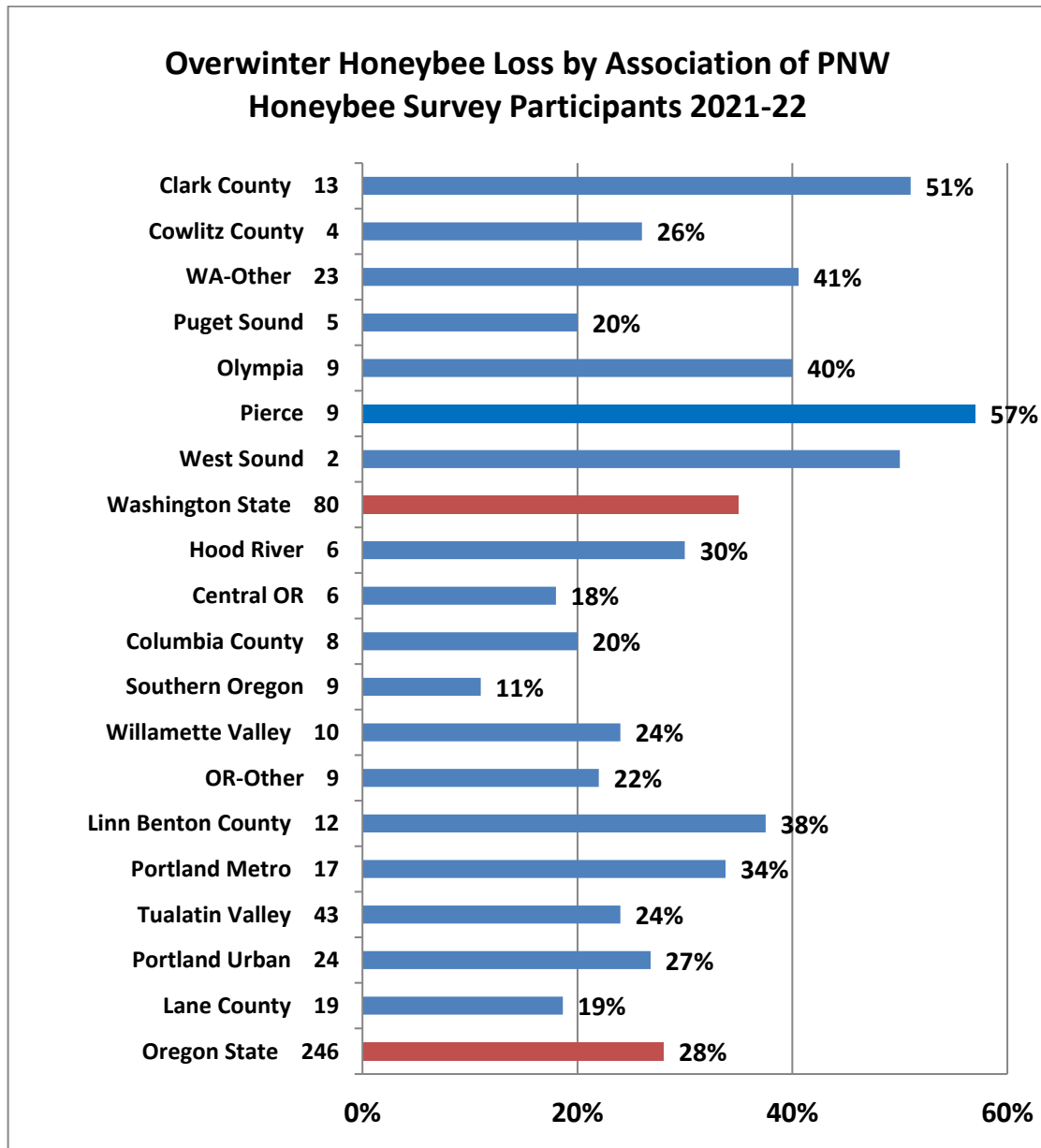


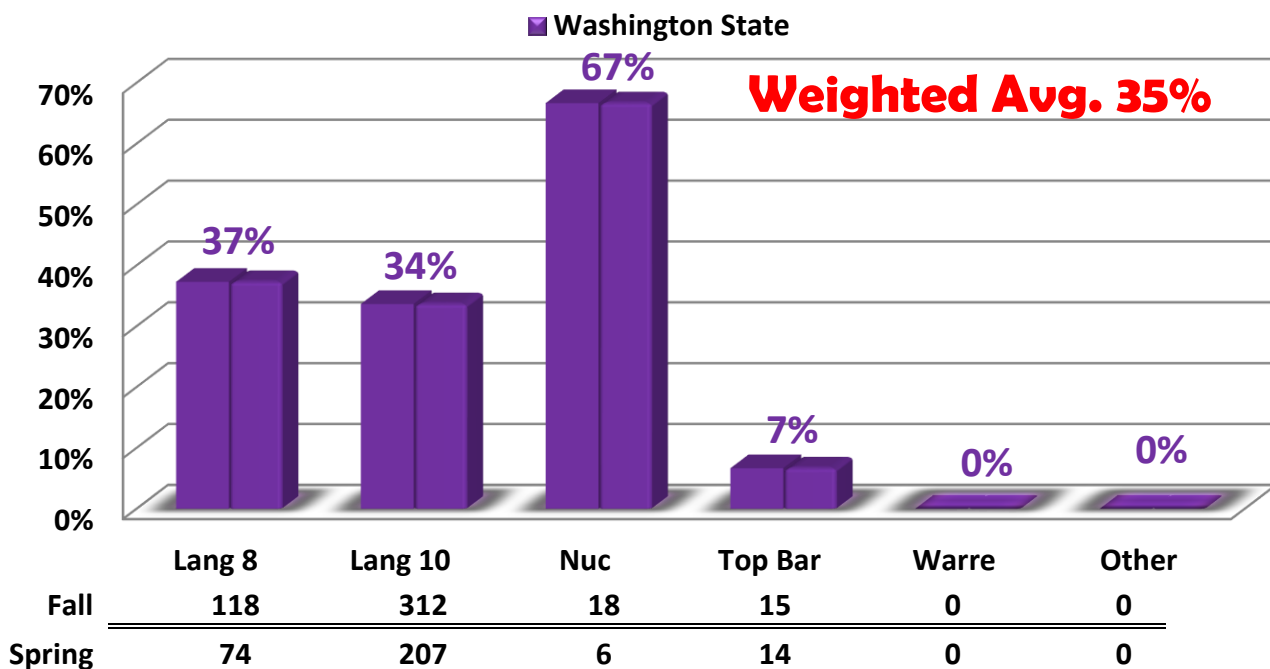
Figure 1

Response by local Oregon (OR) & Washington (WA) association varied as indicated by blue bars in Figure 1. Statewide loss level is highlighted with orange bar. The number of respondent individuals is listed next to the association name. The bar length is the average club loss percentage for the year. Survey included 845 fall Washington beekeeper colonies. Total WA backyard beekeeper overwinter loss = 35% loss, two percentage points lower than last year.

2019-2020 Overwinter Losses by Hive Type

The Washington survey overwintering loss statistic was developed by subtracting number of spring surviving colonies from fall colony number supplied by respondents by hive type. Results, shown in Figure 2 bar graph, illustrate overwintering losses of 80 total WA beekeeper respondents (463 fall colonies). Langstroth 8 and 10 frame beehives (71% of total) had lower average losses (37.5%) than the nucs (67% loss) or Top Bar hives; there were no Warré hives. There was a total of 15 -3% of total hive count - that were not traditional movable frame hives.

Winter Honeybee Loss % by Hive Type, 2021-22

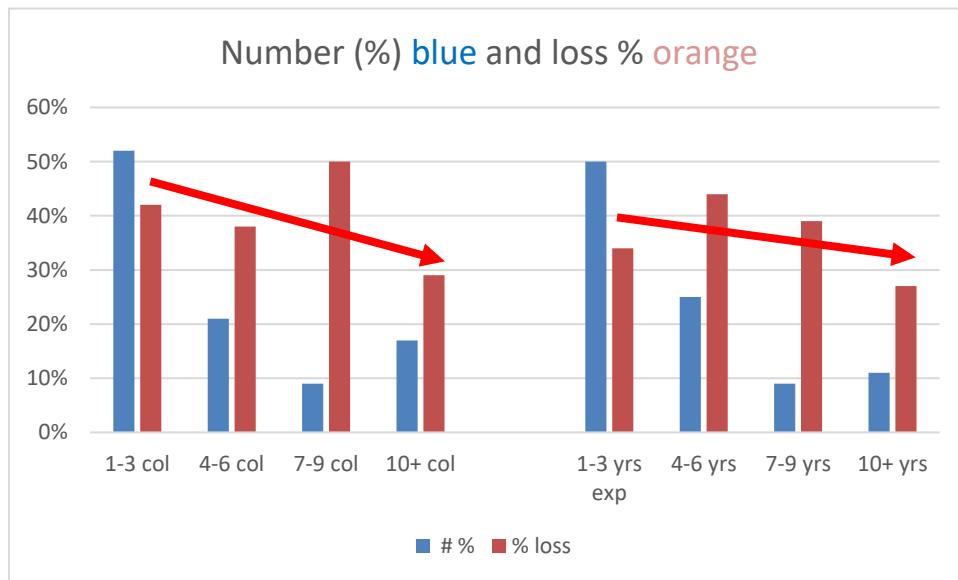


The WA respondents to the electronic survey managed up to 39 fall colonies. Twelve individuals had a single colony (and had colony loss of 25%), 21 respondents had 2 colonies (the greatest number) with 40% loss and 9 individuals had 3 colonies (52% loss). Three was median number. Typical of survey, forty-two individuals (52.5% of respondents) had 1, 2 or 3 fall colonies (loss level of 42%). Seventeen individuals had 4 to 6 fall colonies and had loss level of 38%. Six individuals had 7 and one had 8 colonies, they had loss level of 50%. Nine individuals had 10-16

colonies with loss level of 43% and there were 5 individuals with 20-39 colonies had loss level of 17%. Fourteen individuals (17.5%) had 10 or more colonies. They lost 29% of their colonies compared to 35% overall loss for Washington beekeepers. See Figure 3 (graphs to left).

Forty (50.9% of total) had 1, 2 or 3 years of experience; they had a 34% loss level - first year individuals had 37% loss. Twenty individuals (25% of total respondents) had 4 – 6 years’ experience (medium number = 4) with a 44% loss, 7 individuals had 7-9 years experience (loss level 39%), 9 had 10-17 years keeping bees and 27% loss level and 4 had 20 to 49 years experience (highest level) and they had a 26% loss level. Clearly this is opposite of the individuals with colony numbers. Figure 3 illustrates - arrows are colony loss; blue bars represent percent individuals.

Figure 3



Sixty-two (77.5%) WA beekeepers had an experienced beekeeper mentor available as they were learning beekeeping. This percentage was higher than last four previous years.

Survival Based on Hive Origination

We also asked about hive loss by origination. Data shown in Figure 4. Best survival was previously overwintered colonies. Splits experienced next best survival. The remainder had similar loss level. Figure 4 below.

Winter Honeybee Loss % by Origination, 2021-22

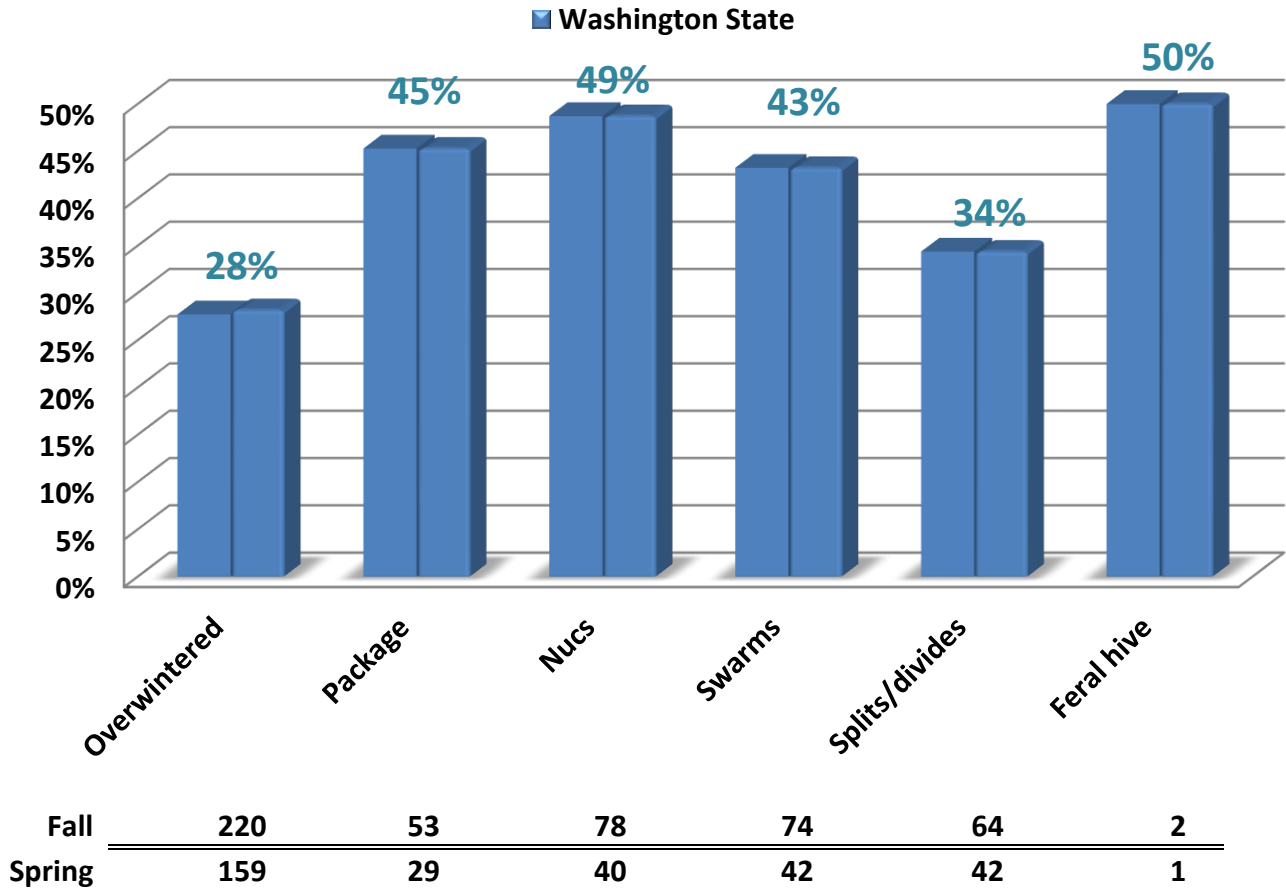
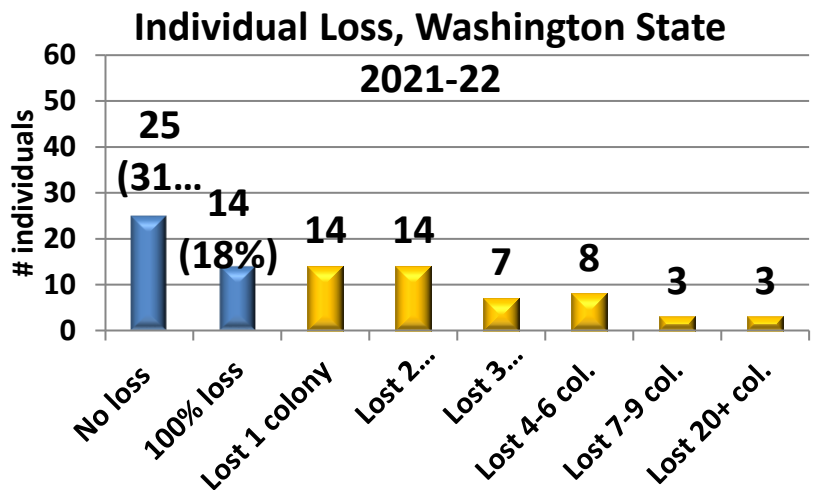


Figure 5

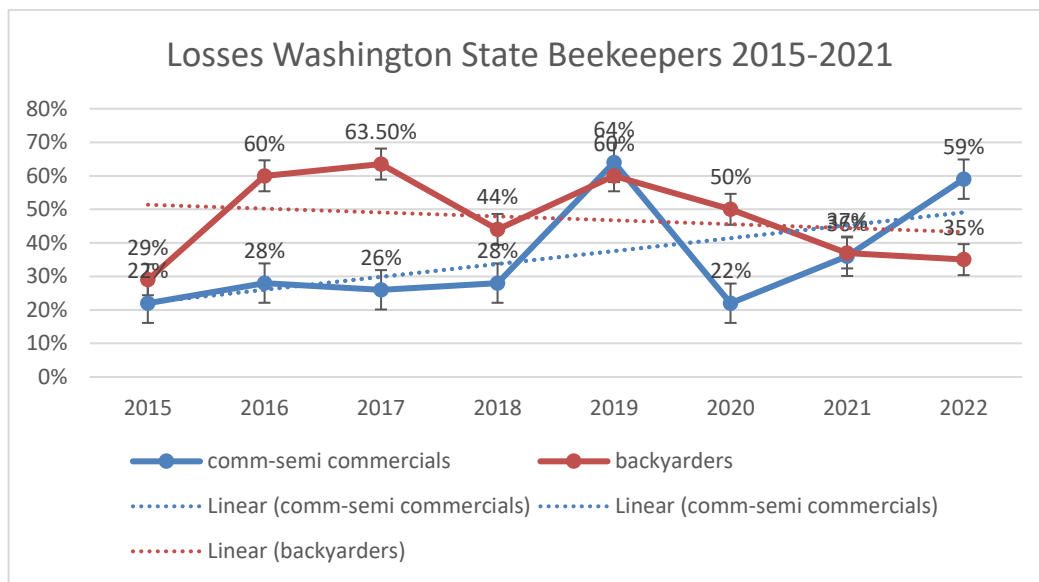
Among 80 WA beekeepers, 9 individuals (11%) maintained more than one hive type. For the total WA beekeeper respondents, 25 (31%) had no loss and 14 individuals (18%) had total loss. Fourteen WA individuals lost 1 or 2 colonies; 7 individuals lost 3 colonies (71% of individuals with losses). Eight individuals lost 4-6 colonies, 3 lost 7-9 colonies. Three individuals lost 10 or more colonies; highest loss was 12 colonies. Data in Figure 5



Comparison to Larger-Scale Beekeeper Losses

A different (paper) survey instrument was mailed to Pacific Northwest (PNW) semi-commercial (50-500 colonies) and commercial beekeepers (500+) asking about their overwintering losses. Comparison is shown in Figure 6 below with approximate number of colonies represented by the commercial/semi-commercial beekeepers and number of individual backyarder survey respondents. Also shown is the trend line of losses of both groups. Average loss level for Washington backyarders=49.6% and for Washington commercial/semi-commercial beekeepers = 33.3% (no data for 2022 from commercials).

Figure 6



# Comm hives	~40,000	33,200	16,604	29,015	~20,000	20,500	20,000	27,000
# backyarders	31	52	101	104	98	133	163	80

Backyard losses have consistently been higher, in some years double the losses of larger-scale beekeepers, but in 2018-19 the commercial losses were higher than backyarder losses. Number of colonies of the commercial keepers returning surveys were essentially the same this past season (returns were an estimated 26% of the NASS estimate of 77,000 colonies in the state). The reasons backyarders have had higher losses 6 of the past 7 years are complex. Commercial and semi-commercial beekeepers examine colonies more frequently and they examine them first thing in the spring as they take virtually all of their colonies to pollinate almonds in February. They also are more likely to take losses in the fall and are more pro-active in varroa mite control management.

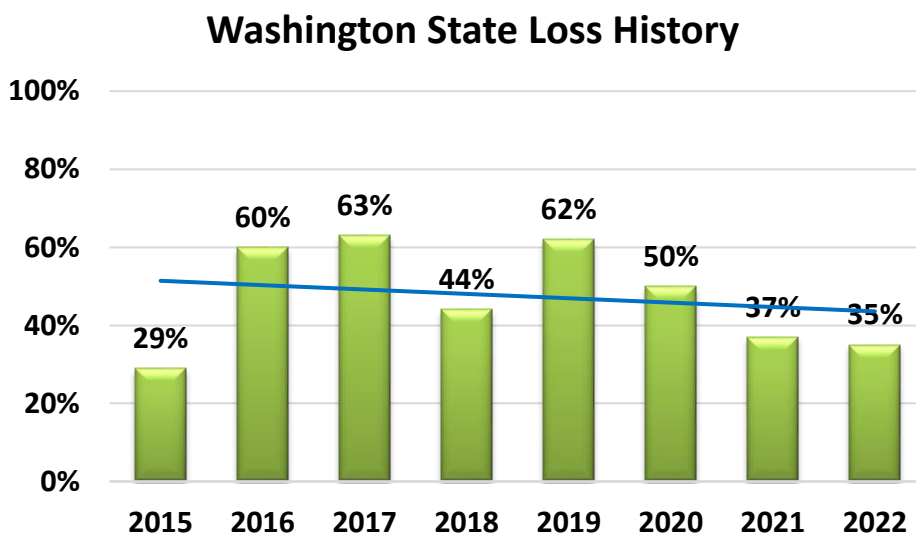
The PNW survey was conducted in part to “ground truth” the annual BeInformed Survey (BIP) also conducted during April. The BIP survey includes a mailed survey to larger-scale beekeepers and an electronic survey to which any Washington beekeeper can submit their data. Losses reported include colonies of migratory beekeepers who reported WA as one of their yearly locations. The BIP survey for the 2015-21 annual surveys reports receiving responses from 90 to 95% of respondents

exclusive to Washington but loss is computed on no more than 4% of the colonies exclusive to Washington state, indicating the BIP tally is primarily of commercial beekeepers (who almost exclusively move to CA for pollination of almonds). Average 7-year BIP WA loss is 26.7%. To access this data, see <https://research.beeinformed.org/loss-map/>

Eight year loss history

The 8-year record of losses is shown below with the trend line for Washington backyarders. Average loss is high at 47.5%.

Figure 7



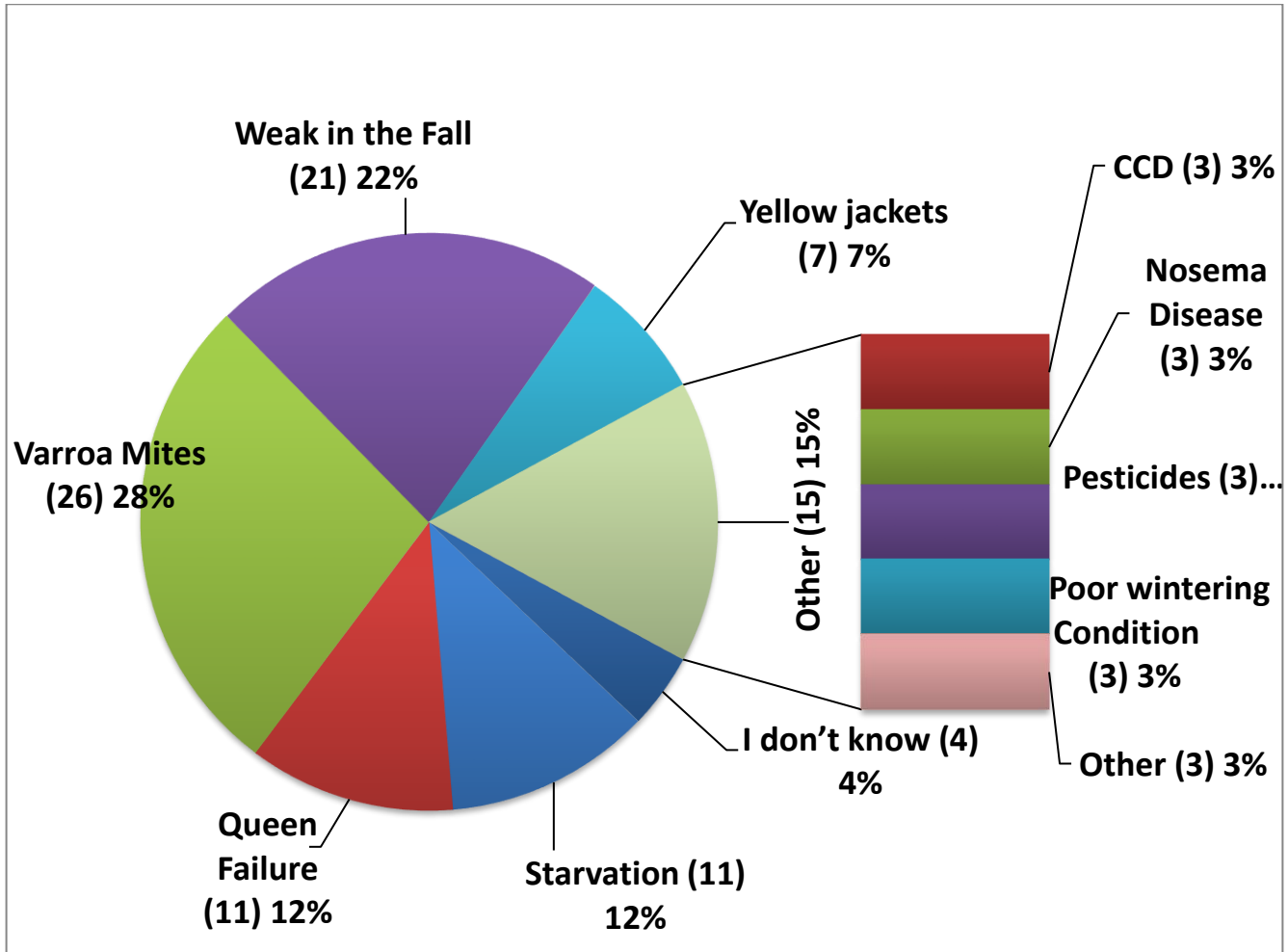
Apiary sites and moves

Ten survey respondents had bees at more than a single apiary. Half that number, 5 moved bees. One moved close for nucs, 1 moved 1000 miles, one moved to new home and 2 moved for honey production.

Colony death perceived reason and acceptable loss level

We asked survey takers who had winter losses for the “reason” for their losses. More than one selection could be chosen. In all there were 95 WA selections (1.7/individual) provided. Weak in the fall (21 individual choices) and Varroa mites (26) were most common choices. Moisture and mice were among other. Figure 8 shows the number and percent of factor selections.

Figure 8



Acceptable loss: Survey respondents were asked reason for loss. Nine (12%) indicated zero (no loss). Fifty-seven percent of individuals indicated 10% or less. 10% was medium choice. Nineteen percent said 50% was an acceptable loss level. See table below.

Loss level	5%	10%	15%	20%	25%	33%	50%	75%	100%	None	IDK
#	5	12	10	3	15	8	15	0	0	9	0
%	6%	16%	13%	4%	19%	10%	19%	0%	0%	12%	0%

Why do colonies die? There is no straightforward way to verify reason(s) for colony loss. Colonies in the same apiary may die for several reasons. There appears to be no single reason for loss and 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. Major factors are thought to be mites, pesticides, declining nutrition adequacy of the environment and diseases, especially viruses and Nosema. Management, failure to do something or doing things incorrectly, remains a factor in our losses. More attention to colony strength and checking stores to help avoid winter starvation will help reduce some of the losses. **So, there is no simple answer to explain the levels of current losses nor is it possible to demonstrate that they are excessive for all the issues facing honey bees in the current environment.**

Managements

Stay tuned I am working on managements as they relate to colony losses. Due to lower response rates, I will NOT be doing any individual club losses for any of the Washington clubs (small response results in less reliable and non-statistically valid analysis). I will work the number up for a club newsletter or if I am invited to your monthly meeting.

Closing comments

This survey is designed to 'ground truth' the larger, national Bee Informed loss survey. Some similar information is additionally available on the BeeInformed website www.beeinformed.org and individuals are encouraged to examine that data base as well. Recall that the BeeInformed survey is reporting losses of the larger scale WA beekeepers not the backyarders (Figure 5). Reports for individual bee groups with 18 or more respondents are customized and posted to the PNW website.

We 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. We have a blog on the pnwhoneybeesurvey.com and will respond to any questions or concerns you might have.

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 August 2021