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.

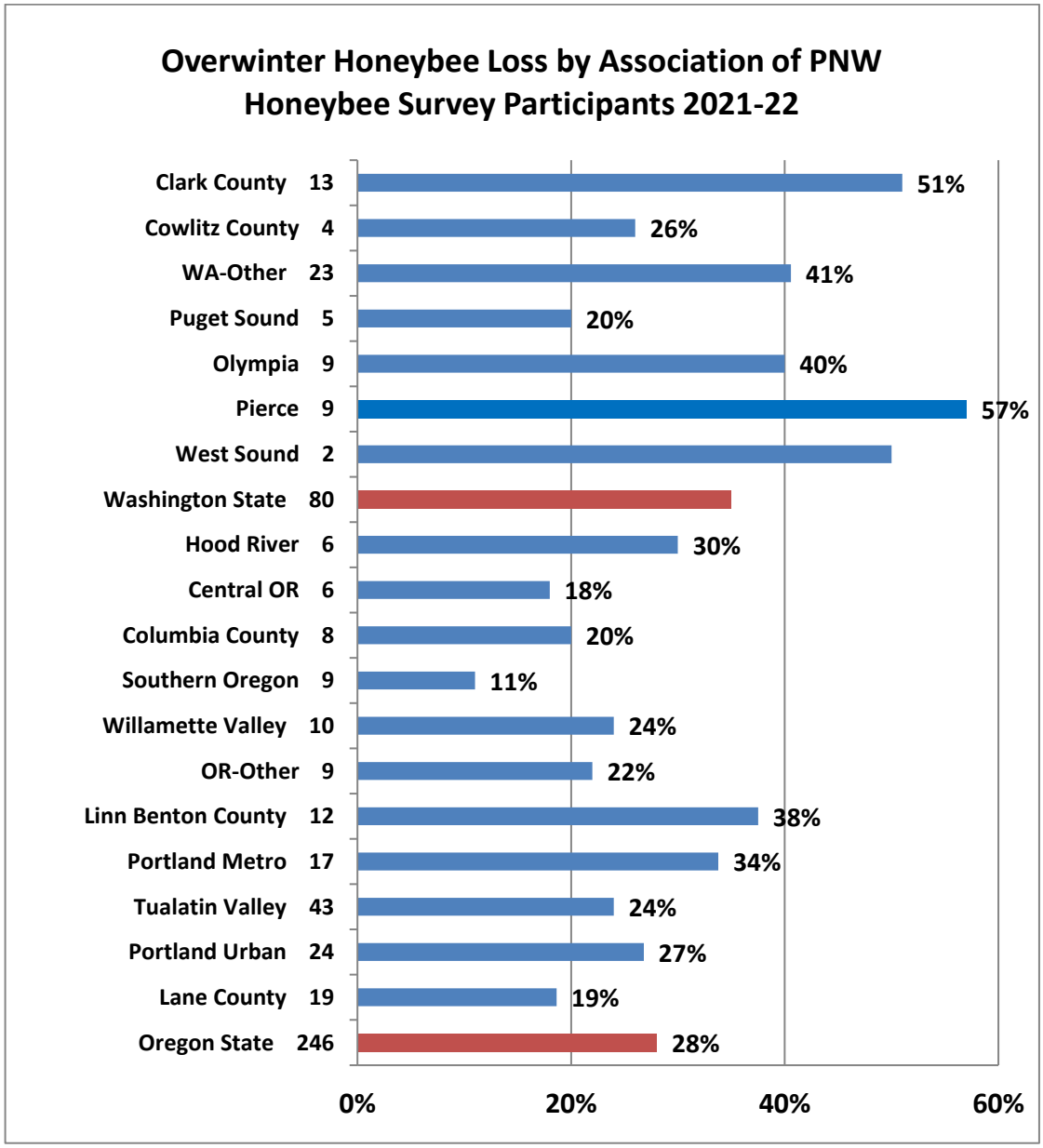
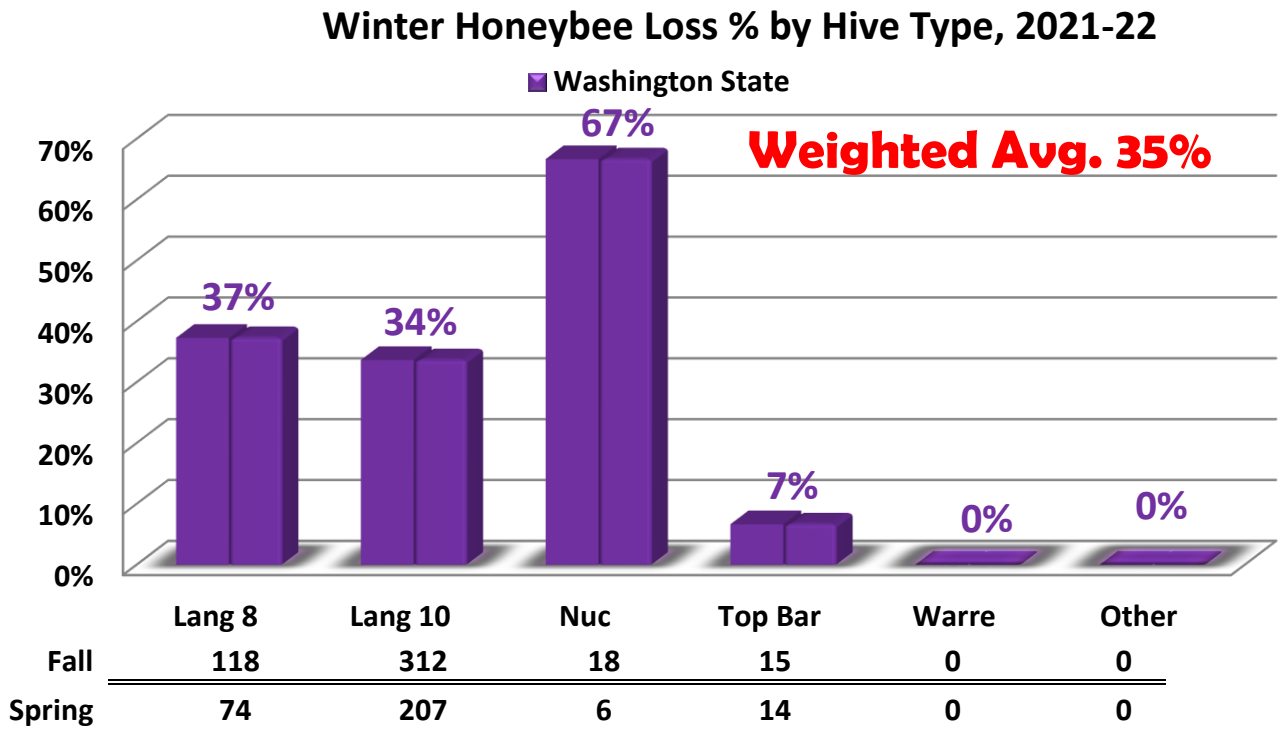


Figure 1

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.

2021-2022 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.

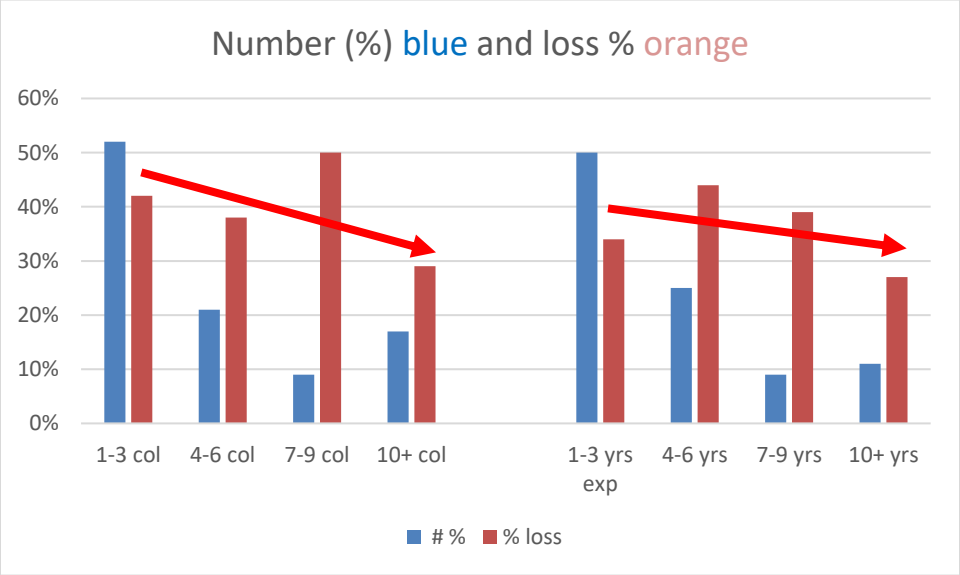


The WA respondents to the electronic survey managed up to 39 fall colonies. Twelve individuals had a single colony (and had colony loss of 25%), 21 respondents had 2 colonies (the greatest number) with 40% loss and 9 individuals had 3 colonies (52% loss). Three was median number. Typical of survey, forty-two 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% 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.

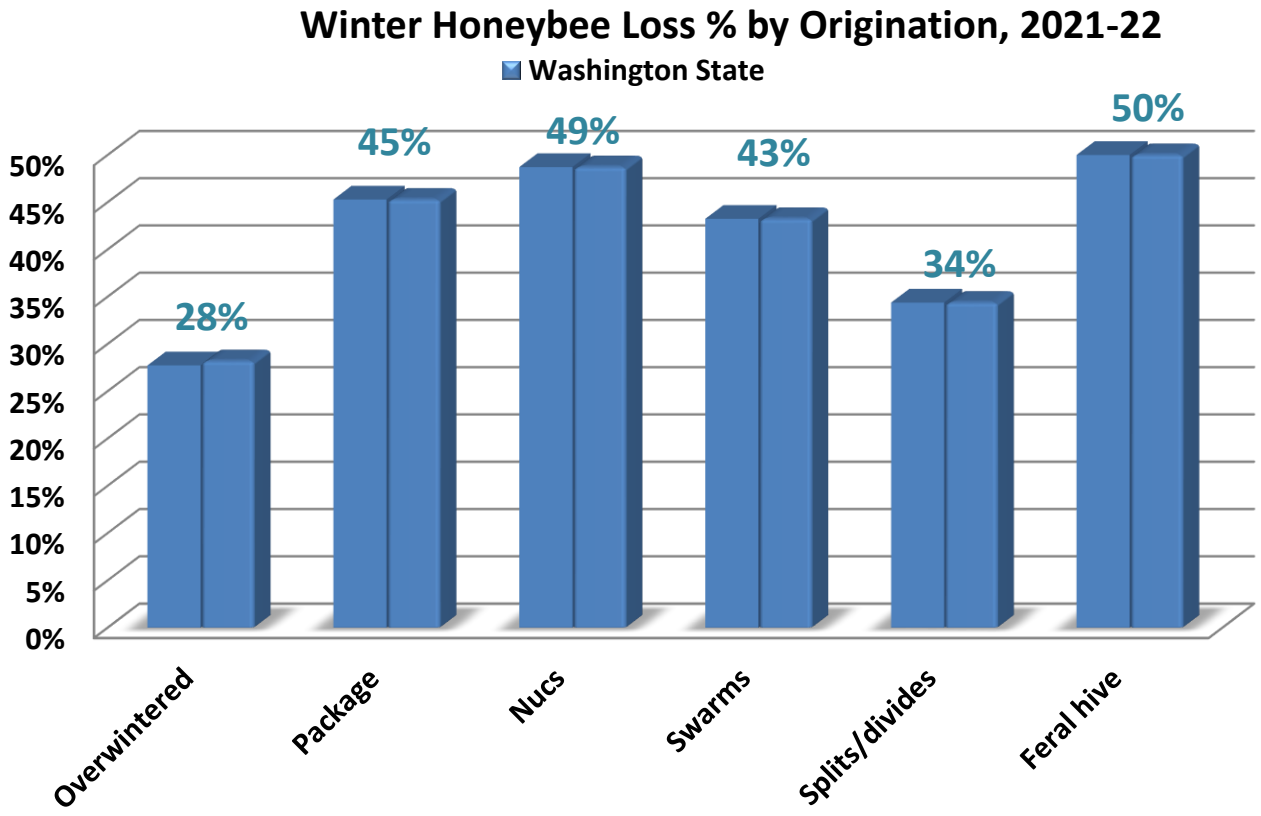
Figure 3



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

Survival Based on Hive Origination

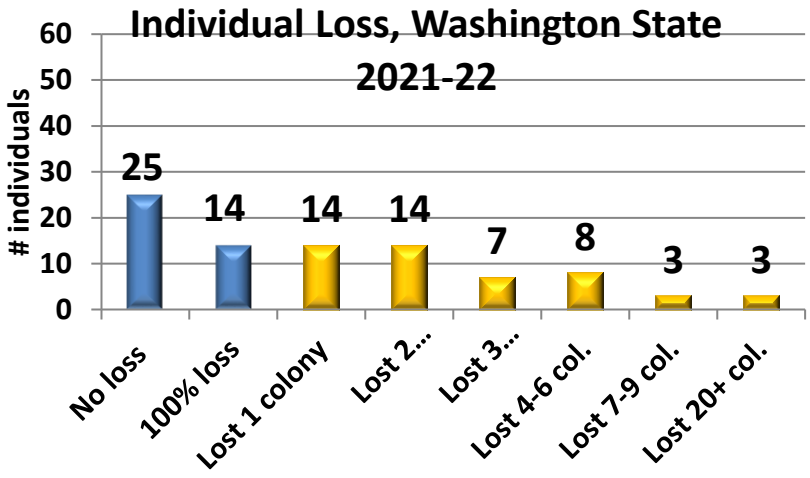
We also asked about hive loss by origination. Data shown in Figure 4. Best survival was previously overwintered colonies. Splits experienced next best survival. The remainder had similar loss level. Figure 4 below.



Fall	220	53	78	74	64	2
Spring	159	29	40	42	42	1

Figure 5

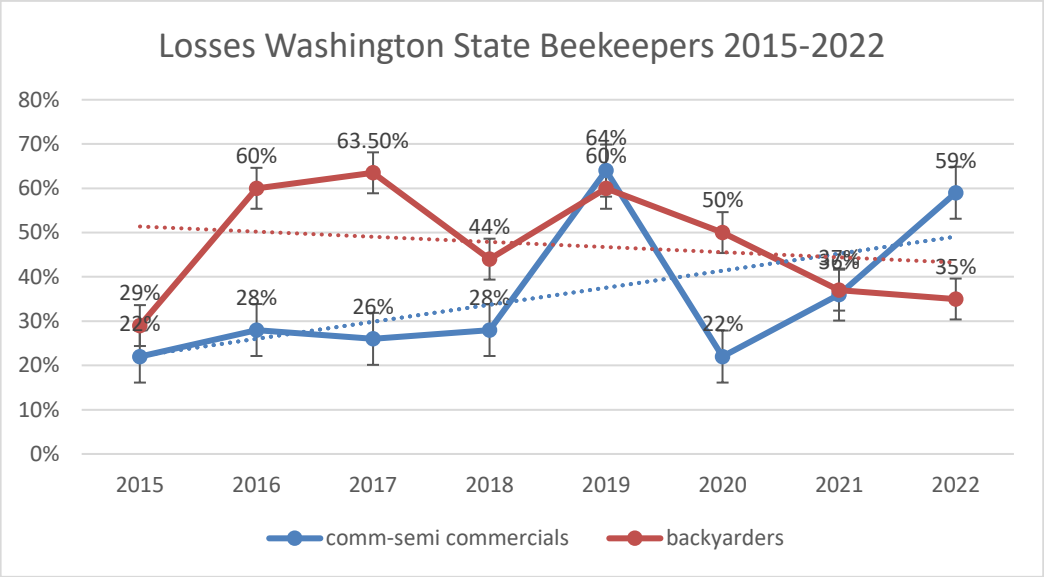
Among 80 WA beekeepers, 9 individuals (11%) maintained more than one hive type. For the total WA beekeeper respondents, 25 (31%) had no loss and 14 individuals (18%) had total loss. Fourteen WA individuals lost 1 or 2 colonies; 7 individuals lost 3 colonies (71% of individuals with losses). Eight individuals 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 and again this past year, the commercial losses were higher than backyarder losses. (I think this is due to lack of getting a large commercial beekeeper response – The BIP losses for Washington beekeepers will likely be a more accurate reflection of commercial losses when it is released) . 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 8 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.

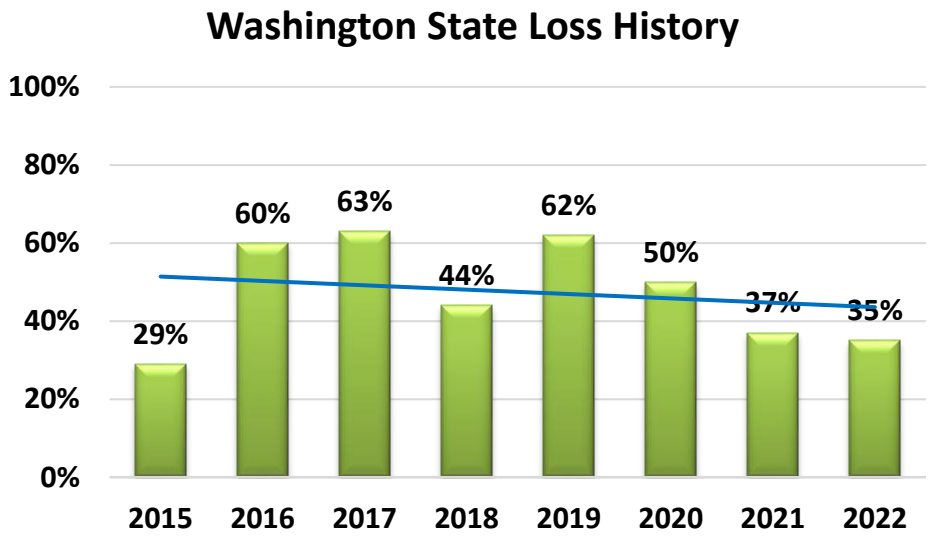
The PNW survey was conducted in part to "ground truth" the annual BeeInformed Survey (BIP) also conducted during April. The BIP survey includes a mailed survey to larger-scale beekeepers

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



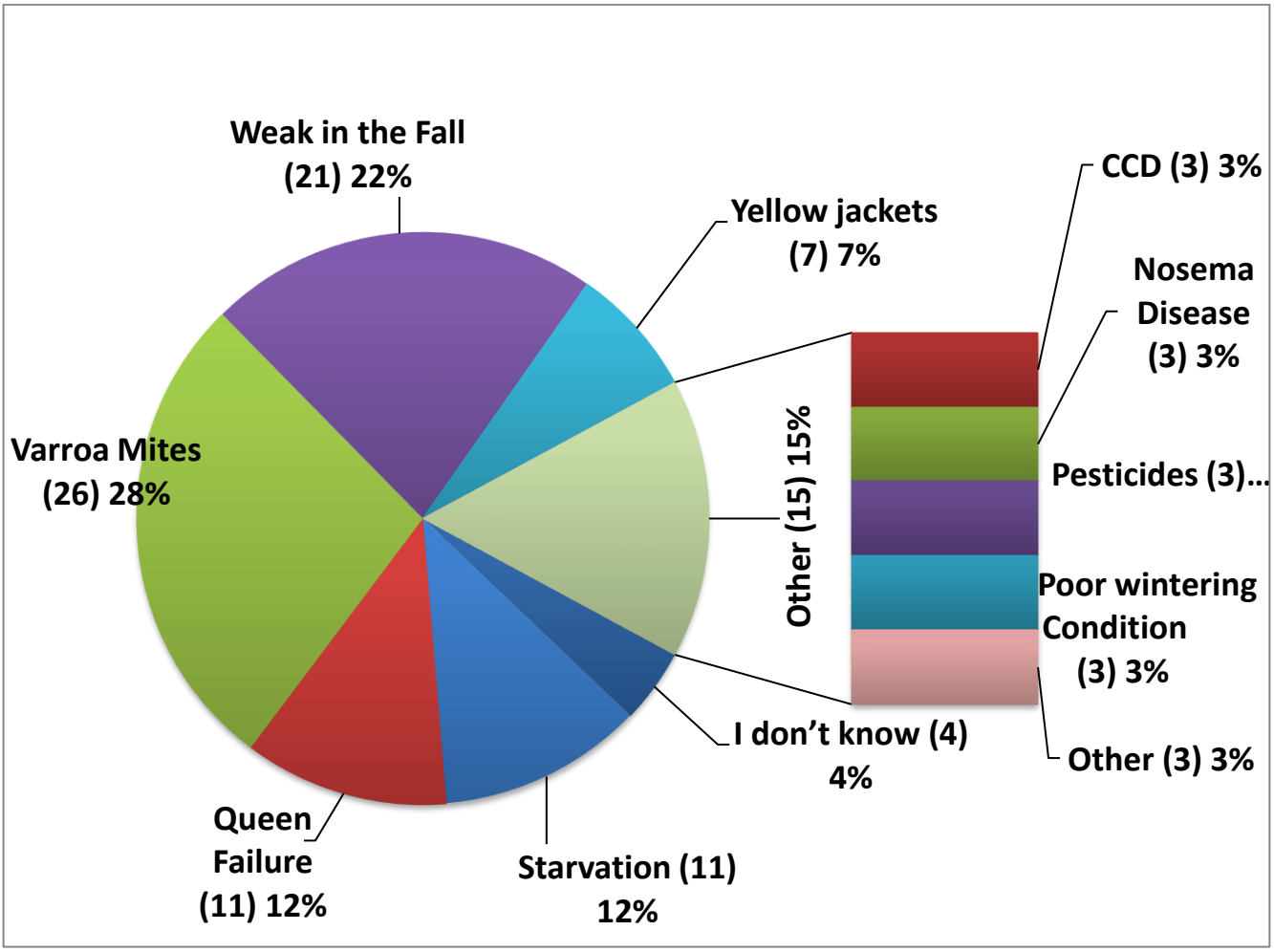
Apiary sites and moves

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.

Acceptable Overwinter Loss per 77 Beekeepers in Washington State during 2021-22											
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

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.

Most Washington beekeepers do not perform just one management to their colony (ies) toward improving colony health and overwintering success. This analysis however compares a single factor equated with loss level. Such analysis is correlative and doing a similar management as fellow beekeepers does not necessarily mean you too will improve success.

FEEDING: Washington survey respondents checked 239 feeding options = 3.1/individual. Two individuals made no selections – they had 40% loss. Eight selected a single choice and had 50% loss level, 17 indicated 2 choices and had a 37% loss. Table illustrates the relationship of number of selections to percent making selection (median was 3) and percent loss of those individuals. The greater the number of selections, the better the survival (lower loss rate).

# selections	# indiv (%)	% loss
1	8 (10%)	50%
2	17 (21%)	37%
3	29 (36%)	32%
4	15 (19%)	35%
5	4 (5%)	34%
6	5 (6%)	27%

The choices, with number of individuals making that selection is in ( ), bar length indicates loss level of individuals doing this management is shown in Figure 9. Those bar lengths to left of 37% (**green dashed line**) had better survival while those to right had greater loss level.

The choices, with number of individuals making that selection is in ( ), bar length indicates loss level of individuals doing this management is shown in Figure 9. Those bar lengths to left of 35% (**green dashed line**) had better survival while those to right had greater loss level.

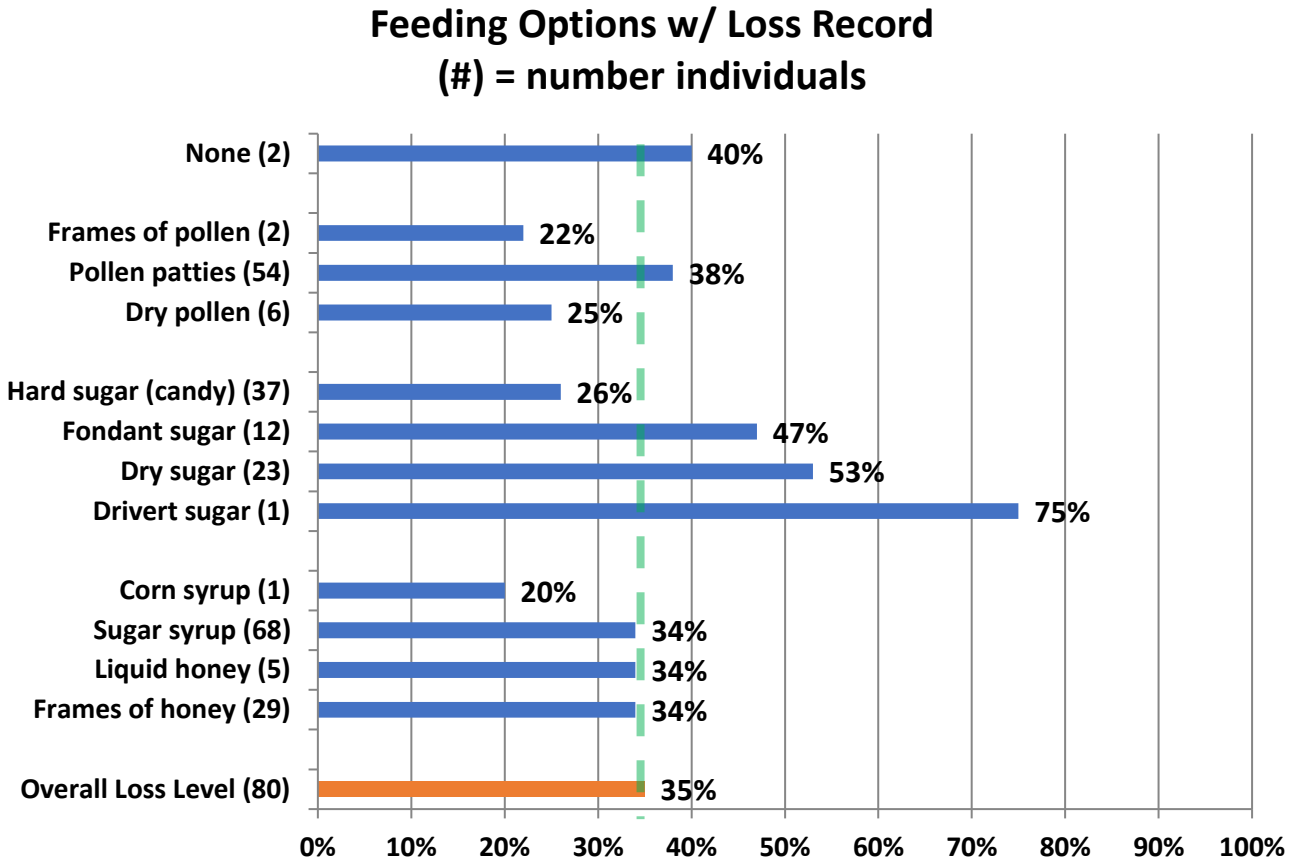


Figure 9

Feeding sugar syrup and honey were the most common feeding option of respondents (68 and 29 individual respectively). Their loss rate was one percentage point below statewide average, statistically same as overall average. Best survival was feeding hard sugar candy (37 individuals had a 26% loss. The remainder of choices below stat average were single (Corn syrup, 2 (frames pollen) or only 6 individuals (dry pollen).

For the last 5 years of survey losses individuals doing no feeding had poorer survival in 4 of the 5 years. Individuals that fed sugar syrup had marginal lower loss level in 4 of five years (including this year) as did those using frames of honey to feed bees. Individuals feeding non–liquid sugar in the form of hard candy likewise had lower losses in 4 of 5 years; this year an 8 percentage point better survival. For individuals feeding protein, protein patty users showed slightly better survival in 3 of 5 years (not this year); dry pollen feeders had significantly better survival in four of the five years but number of individual respondents doing this management is not very large.

WINTERING PRACTICES: We received 223 responses (2.9/individual compared with 2.8/individual last year) indicating WA beekeeper wintering management practices (more than one option could be chosen). Four individuals (5% compared to 12% last year) indicated none of the several listed wintering practices was done; these individuals had a 17% loss a twenty percentage

point better survival from normal 35% winter loss, compared to 74% winter loss last year which was 24 percentage points higher loss than overall loss of 50%.

# selections	# indiv (%)	% loss
1	12 (16%)	46%
2	22 (26%)	40%
3	16 (21%)	39%
4	14 (18%)	16%
5 or 6	12 (16%)	43%

For those indicating some managements, 12 did one single thing and had 46% loss level, 22 respondents doing 2 had 40% loss, 16 (median) had 3 choices with a 39% loss), 14 made 4 (16% loss) and 12 made 5 or 6 choices but had 43% loss.

Managements selected that improved survival were wrapping/using colony insulation (25 individuals – 30% loss level) and equalizing hive strength (9 individuals 32% loss level). Figure 10 shows number of individual choices and percent of each selection. Bar length below 50% (**blue dashed line**) had better than average winter survival.

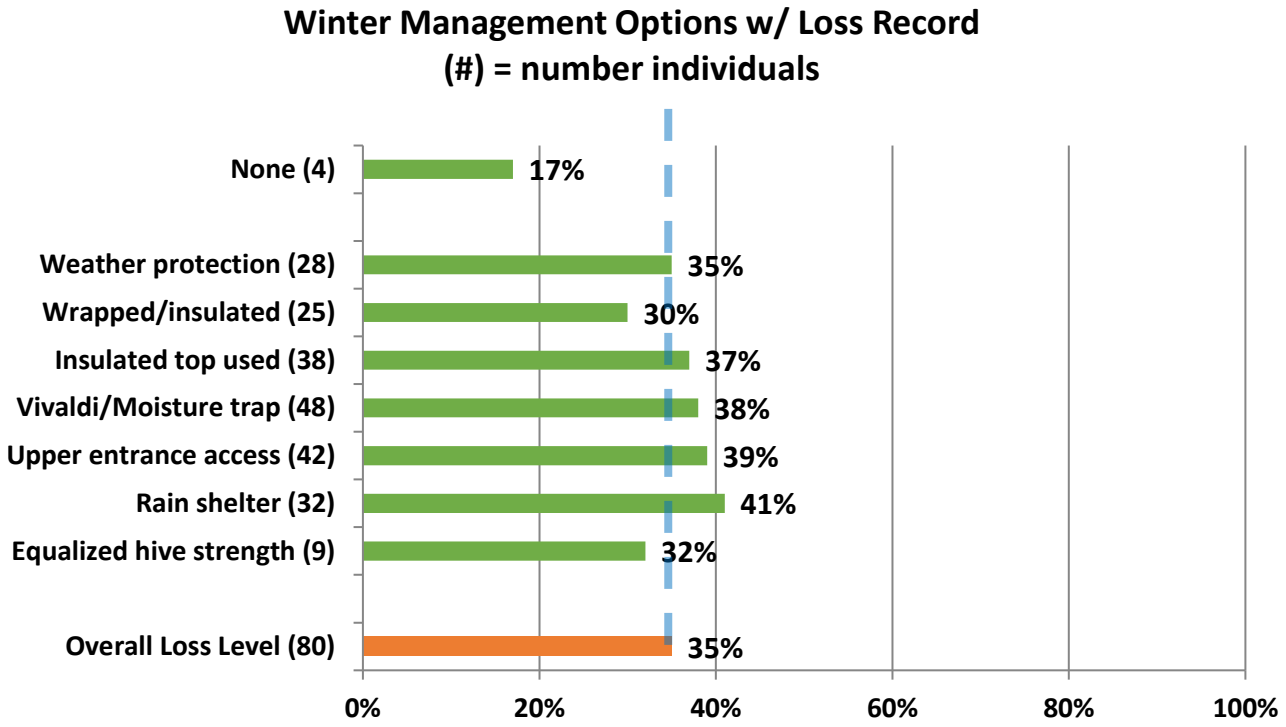


Figure 10

Over the past 5 years a couple of winterizing managements have shown improved survival. Those doing no winterizing had higher losses all 4 of 5 years (this year was the exception at 18 percentage points lower. Equalizing hive strength in the fall demonstrated lower loss levels in all five recent winter periods (this year less than previous years and top insulation has demonstrated lower loss in four of five years; in the most recent winter 38 individuals had a 2 percentage point lower

survival. Ventilation above the colony (Vivaldi Board/quilt box) demonstrated improved survival three of the five winters but had a 4 percentage point poorer survival this past winter.

SANITATION PRACTICES: It is critical that we practice some basic bee sanitation (some prefer use of term bee biosecurity) in our bee care to help insure healthy bees. We received 148 responses for this survey question 2.3/individual (last year it was 2/individual). Fifteen individuals (14%) said they did not practice any of the 6 offered alternatives; they had a loss rate of 28%, 9 percentage points below the statewide average.

# selections	# indiv (%)	% loss
1	51 (36%)	36%
2	47 (33%)	52%
3	28 (20%)	57%
4	10 (7%)	33%
5	5 (4%)	62%

Twenty-two individuals had 1 selection and had 26% loss average, 18 made 2 choices with 50% loss, 14 selected 3 managements with 39% loss; eight had 4 (the worst survival 71% loss rate and the 5 who had 5 or 6 selections had only a 5% loss. It is clear than none of the measures is robust enough to make a difference by itself in reducing winter loss. Figure 12 shows number of individual choices and percent of each selection. Bar length below 50% (**blue dashed line**) had better than average winter survival.

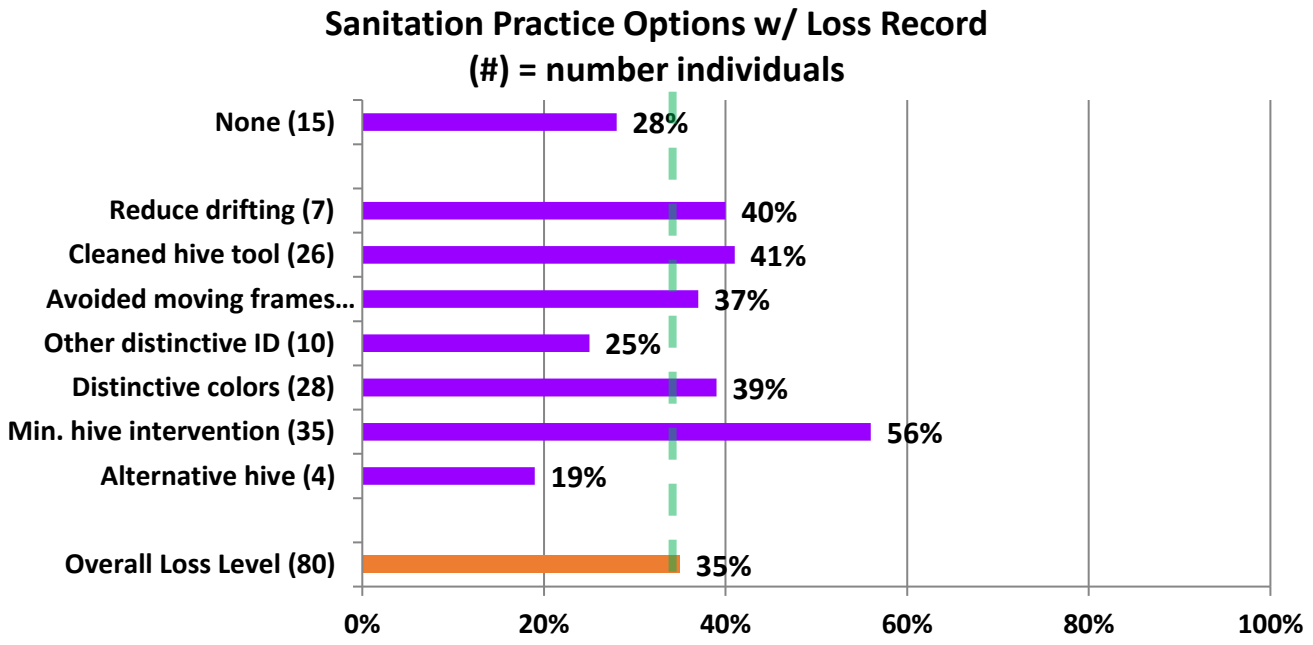


Figure 12

In all five years doing none of these managements resulted in better than average survival; this was the case this past winter when the 15 individuals doing nothing had losses of only 28%. The 10 individuals using other distinctive colony ID measures like spreading colonies out and varying changing colony entrance locations had a 25% loss level. Nine individuals who said they used an alternative hive reported lower losses in three of five winters; this winter the 9 selecting this option had 25% losses. Providing hives with color, distinctive hive ID measures were helpful managements

with losses just under 5 percentage points either side of average in all five years for statewide individuals.

SCREEN BOTTOM BOARDS (SBB)

Although many beekeepers use SBB to control varroa mites, BIP and PNW surveys clearly point out they are not or at best not a very effective varroa mite control tool. In this recent survey 16 Washington individuals (20%) said they did not use screen bottom boards; they lost 43% of their colonies. Those 13 beekeepers using SBB on some of their colonies lost 36% and the 51 individuals (64%) using SBB on all of their colonies had 33% loss.

In 6 survey years 21% of Washington beekeepers said they did not use SBB and 79% did use SBB on some or all of their colonies, see Figure 13.

Examining the six year average of SBB use, those using SBB on all or some of their colonies had a 41.7% loss level whereas for those not using SBB the loss rate was 43.3% (a 2.5% positive survival gain for those using SBB versus those not using them). SBB are a very minor aid in improving overwinter survival for Washington Beekeepers.

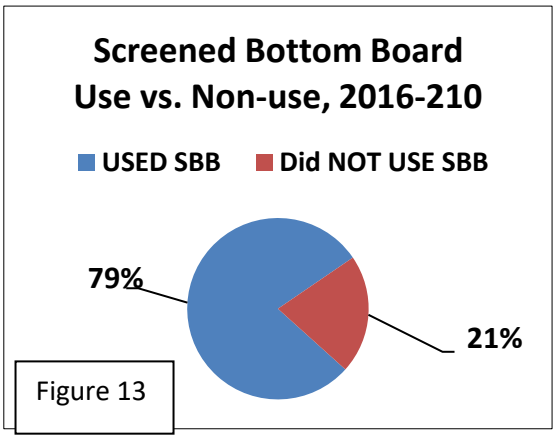


Figure 13

We asked if the SBB was left open (always response) or blocked during winter season. Forty individuals (50%) said they always blocked SBB during winter. They had a 30% loss rate. Nineteen individuals (24%) said they never blocked SBB and had loss rate of 53%. Nine individuals (18%) blocked them on some of their colonies. Their loss rate was 18%.

There is no good science on whether open or closed bottoms make a difference overwinter, but some beekeepers "feel" bees do better with it closed overwinter. Comparing the always and sometimes left open with the closed in winter response reveals a 25 percentage point difference in favor of closing the SBB over the winter period. This relationship has been consistent over the past five years averaging nearly a 10 percentage point advantage when the SBB is closed during the winter (although it was only a larger percentage point difference this last season. An open bottom, at least during the active brood rearing season, can assist the bees in keeping their hive cleaner and promote good hive ventilation.

Things that seem to improve winter success: It should be emphasized that these comparisons are correlations not causation. They are single comparisons of one item with loss numbers. Individual beekeepers do not do only one management option, nor do they necessarily do the same thing to all

the colonies in their care. We do know moisture kills bees so we recommend hives be located in the sun out of the wind. If exposed, providing some extra wind/weather protection might improve survival. Early spring pollen is important so locations where bees have access to anything that may be flowering on sunny winter days is also good management.

Feeding, a common management, appears to be of some help in reducing losses. Feeding dry sugar or a hard sugar candy during the winter meant lower loss levels. Providing frames of honey or sugar syrup, the most common selection, also meant slightly lower loses for some individuals but these basic managements are useful in other ways such as for spring development and/or development of new/weaker colonies besides insuring better winter survival.

Feeding protein in form of pollen patties did slightly improve survival. The supplemental feeding of protein (pollen patties) might be of assistance earlier in the spring season has been demonstrated to help bees build strong colonies, but this may lead to greater swarming.

Winterizing measures that apparently helped lower losses for some beekeepers was equalizing strength, providing an upper entrance and top insulation or a moisture trap (Vivaldi board or quilt box) and some attention to adding protection against the elements. Spreading colonies out in the apiary and painting distinctive colors or doing other measures to reduce drifting also appeared to be of some value in reducing winter losses. Avoiding movement of frames from one colony to another might also improve survival but the gain over what this interchange might accomplish might be greater than a minor advantage in survival.

It is clear that doing nothing for feeding or winterizing resulted in the heaviest overwinter losses.

Replacing standard bottom boards for screened bottoms only marginally improved winter survival. It is apparently advantageous to close the bottom screens during winter.

Mite monitoring/sampling and control management

We asked percentage of Washington hives monitored for mites during the 2021 year and/or overwinter 2021-22, whether sampling was pre- or post-treatment or both and, of the 5 possible mite sampling methods, what method was used and when it was employed. Fifty-five individual respondents (69% - a decrease of 4 percentage points from last year) said they monitored all their hives. Losses of those individuals monitoring was 27%. Fourteen (18%), reported no monitoring; they had a higher loss rate of 48%. Eleven individuals monitored some with loss rate of 48%.

In order of popularity of use, looking on adults was indicated by 35 individuals (46%) who did some or all colony monitoring. Thirty individuals used sticky boards, 45% total of 66 individuals who did some or all monitoring of colonies, followed by 28 individuals (42% of individuals doing

monitoring) that used alcohol wash. Twenty-one individuals used drone brood monitoring and 13 used powder sugar to monitor In terms of losses, the alcohol washers had the lowest loss level of 35% loss with the rest over 40% - Drone brood 45%, adults 46%, sticky boards 48% and powdered sugar 49%.

Most sampling to monitor mites was done in July – September, as might be expected since mite numbers change most quickly during these months and results of sampling can most readily be used for control decisions. See Figure 14 below for number of months each of the 5 sampling methods were used.

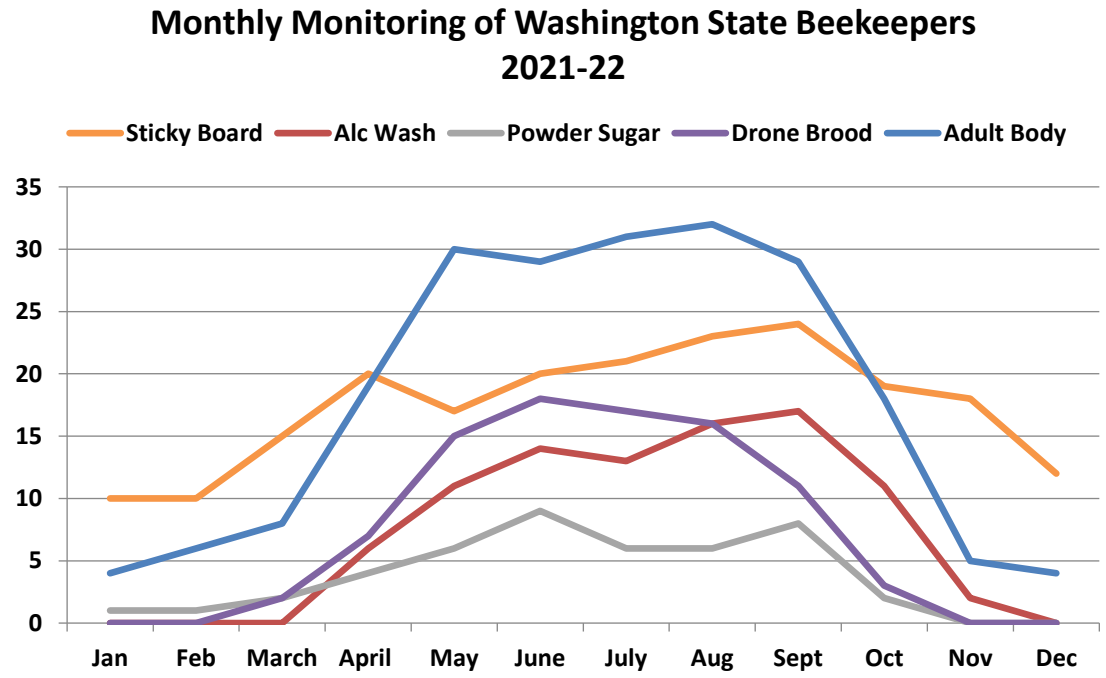


Figure 14

The most common sampling of respondents in 2021-22 was sampling both pre and post (29 individuals 36% of respondents); they had 35% loss, average for the 80 Washington beekeepers. Those 9 sampling pre had a 48% loss while those sampling post had a 19% loss (I am not sure why the big difference). Individuals neither sampling nor treating (5 individuals) had heaviest loss 67% while those treating but not sampling (28 individuals) had average losses (36%). The one individual that sampled but did not treat lost all 3 of their colonies.

It is important to KNOW mite numbers. Less effective mite monitoring methods include sticky (detritus) boards below the colony (often so much detritus drops onto a sticky board that picking out the mites can be hard, especially for new beekeepers) but sticky boards used for a day can help confirm the useful of a treatment when inserted post treatment. Visual sampling is not accurate: most mites are not on the adult bees, but in the brood. Unfortunately looking for mites on drone

brood is also not effective as a predictive number but can be used as an early warning that mites are present; if done, look at what percentage of drone cells had mites.

See ***Tools for Varroa Monitoring Guide*** www.honeybeehealthcoalition.org/varroa on the Honey Bee Health Coalition website for a description of and to view videos demonstrating how best to do sugar shake or alcohol wash sampling. The Tools guide also includes suggested mite level to use to base control decisions based on the adult bee sampling. A colony is holding its own against mites if the mite sample is below 2%. It is critical to not allow mite levels to exceed 2% during the fall months when bees are rearing the fat fall bees that will overwinter. It is also the most difficult time to select a control method (if one is deemed needed) as potential treatment harm may negatively impact the colony. We are seeing more colonies suddenly disappear (abscond?) during the fall, which may be related to the treatment itself.

Mite Control Treatments

The survey asked about non-chemical mite treatments and also about use of chemicals for mite control. Thirteen individuals (16%) said they did not employ a non-chemical mite control and 6 individuals (7.5%) did not use a chemical control. See Figure 14. Those 13 individuals who did not use a non-chemical treatment reported a 31% winter loss, while those who did not use a chemical control lost 67% of their colonies. The individual options chosen for non-chemical and chemical control are discussed below.

Non-Chemical Mite Control: Of nine non-chemical alternatives offered on the survey (+ other category,) 148 selections were indicated 2.2/person (last year 2.3/individual). Twenty-two individuals used one method and had a 31% loss, nineteen used two (also 31% loss level), seventeen used three (38% loss), eight used four and nine used 5 and they had 46% loss. Use of screened bottom board was listed by 51 individuals (76% of individuals selecting other than none). They had average losses. The next most common selection was minimal hive inspection (28 individuals) and they had 53% losses. The use of the remaining 7 selections are shown in Figure 15; number of individuals in ( ), bar length represents average loss level of those individuals using each method. Those to left of **green dashed line** had better than average survival.

Two of the non-chemical alternatives – drone removal (12 individuals) and brood cycle interruptions (9 individuals)- have also been useful in previous year surveys in reducing winter losses (in some of past 5 years but not all) but both this year did not improve survival. Painting hives distinctive colors has resulted in better survival in each of past four survey years: this year by six percentage point. Small cell/natural comb has not been demonstrating better survival but did this past year (but only by 3 percentage points).

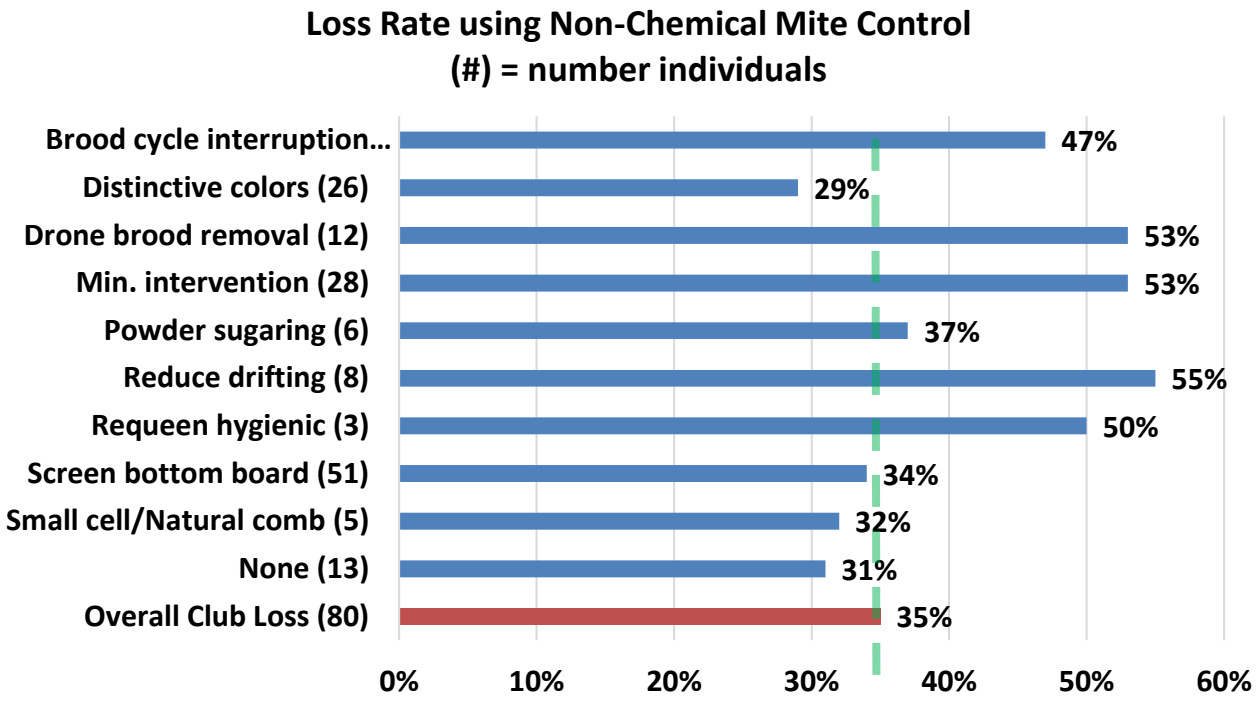


Figure 15

Chemical Control: For mite chemical control, 6 individuals (7.5% of total respondents) used NO chemical treatment; these individuals had a 67% loss level (only 4 percentage points higher than last year). Those using chemicals used at rate of 1.8/individual. Twenty-nine individuals (45%) used one chemical and had 33% loss, 33 used two and had 37% loss, 7 used 3 (34% loss) and the 5 using 4 had 29% loss.

Consistently the last 3-4 years five different chemicals have helped beekeepers realize better survival. The essential oils Apiguard and ApiLifeVar have consistently demonstrated the lowest loss level; this year (and last) no responding Washington beekeeper used ApiLifeVar. Over last five years Apiguard users had a 37% better survival rate. Apivar, the synthetic (amitraz), has demonstrated a 36% better survival over past 6 years (2017-22).

Oxalic acid vaporization over past 5 years has a 20% better survival (the survey did not differentiate Oxalic vaporization from drizzle prior before 2018); this year only 2 percentage point difference. Formic acid demonstrated also provides better survival. Formic Pro is readily available while the quick strips are only produced via special order. Both did well for individuals this past year.

Figure 16 illustrates number of uses ( ) and bar length indicates the loss rate for those using that chemical.

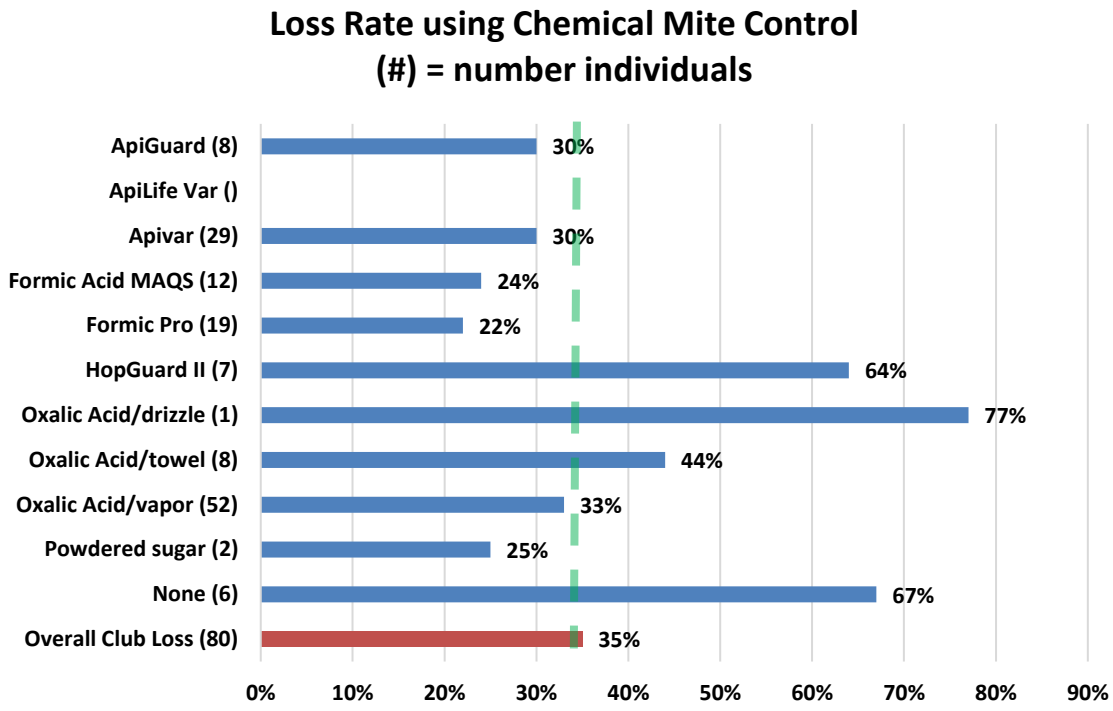
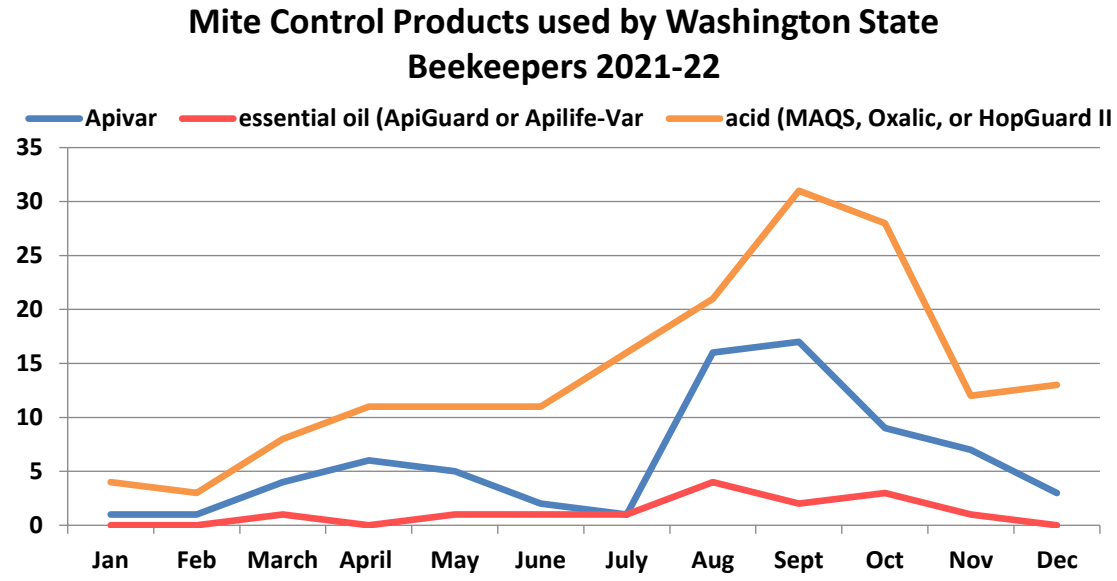


Figure 16

The monthly use of Apivar (blue line), essential oil (red line) or an acid (green line) is shown in Figure 17. Further review is needed to determine if the timing of treatments was more effective than at other times for the various chemicals.

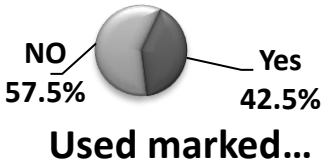


Antibiotic use

Three individuals used Fumagillin (for Nosema control); their loss rate was 14.5%. None indicated using terramycin.

Queens

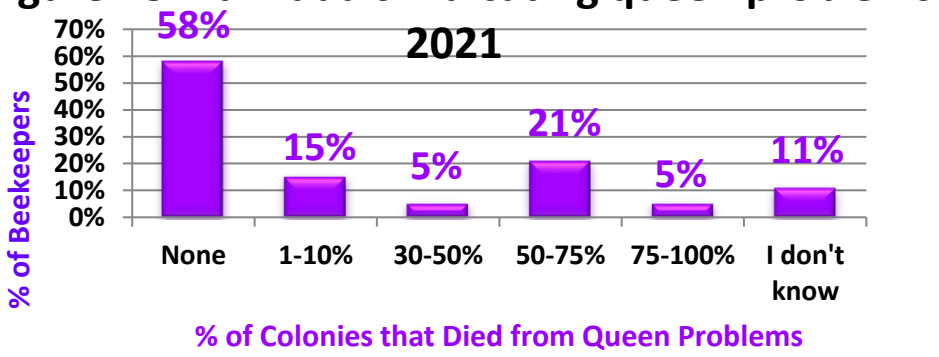
We hear lots of issues related to queen "problems." Eleven individuals indicated queen problems as reason for loss in earlier part of survey. In Section 8 of the survey, we asked what percentage of loss could be attributed to queen problems. Forty -one individuals (51%) subdivided queen related issues from 1-10 to 75-100% of their hives; twelve said 1-10% (loss level of 43%). The remainder had losses over 47% except inexplicably the four individuals who said they had 75-100% queen issues they lost none of their 11 colonies. zero colonies.



Queen events can be a significant factor contributing to a colony not performing as expected. We asked if you had marked queens in your hives. Thirty-four individuals (42.5%) said yes. The related question then was 'were your hives requeened in any form?' to which 53% (42 individuals) said yes, 26% said no (33%). and the remainder 'not that that I am aware of.'

One technique to reduce mite buildup in a colony is to requeen/break the brood cycle. The question "How did bees/you requeen" received 86 responses (more than one option could be checked). Twenty-two individuals indicated they requeened with a mated queen and they had a 42% loss level, two used a virgin queen (50% loss) and 7 used a queen cell (43% loss). Seventeen said they split their hive(s) 38% loss, 19 indicated their colonies swarmed 35% loss and an equal number said

Figure 18 individuals indicating queen problems



supersedure – they had a 35% loss. Loss levels obviously were similar.

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 July 2022