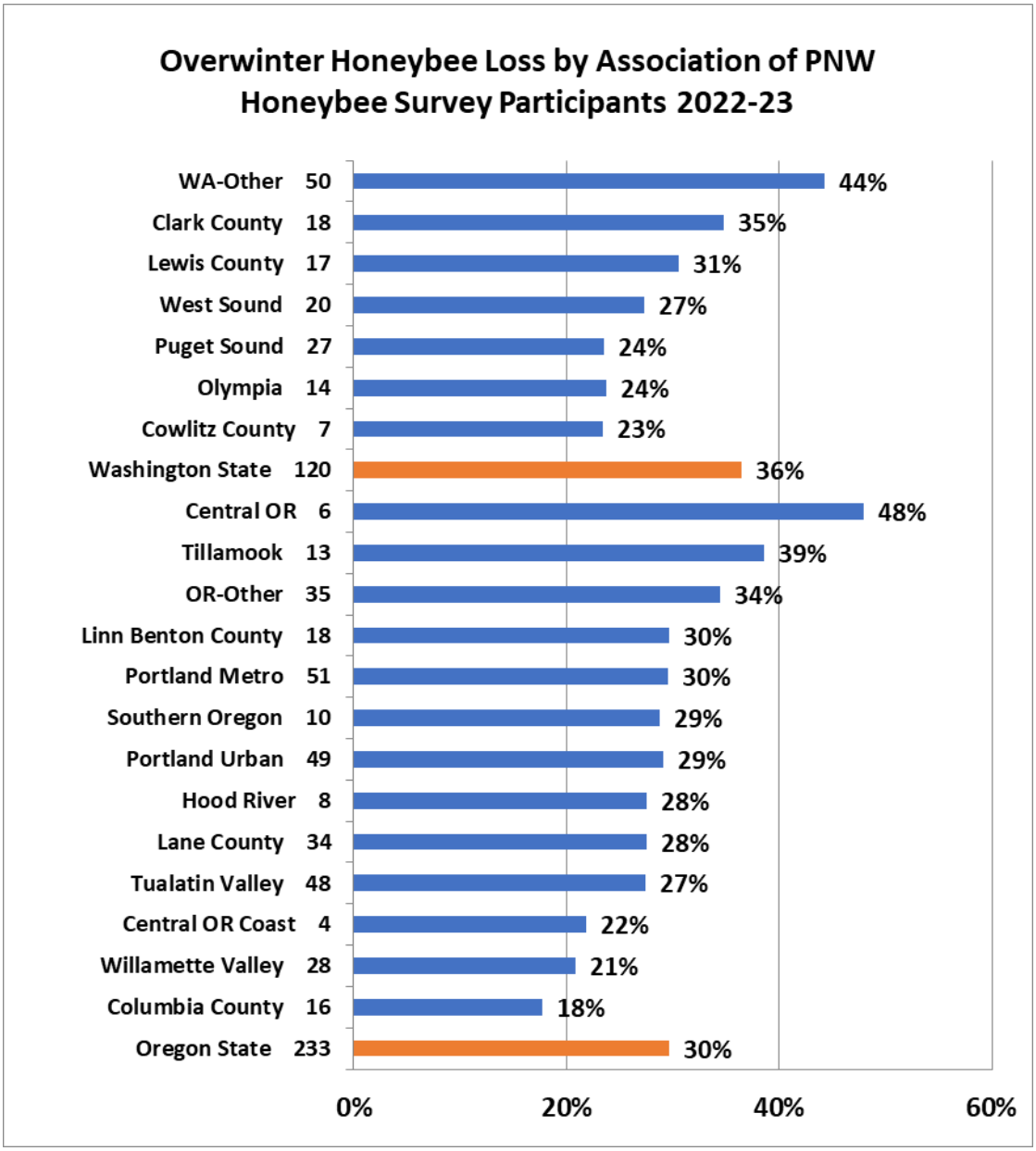
Winter Bee Losses of Washington Backyard Beekeepers for 2022-2023

by Dewey M. Caron

Overwintering losses of small-scale Washington backyard beekeepers=36%, an increase of a single percentage point from last year, 11.2 percentage points below the 8-year loss average. One hundred twenty Washington respondents completed a survey, 40 greater 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.

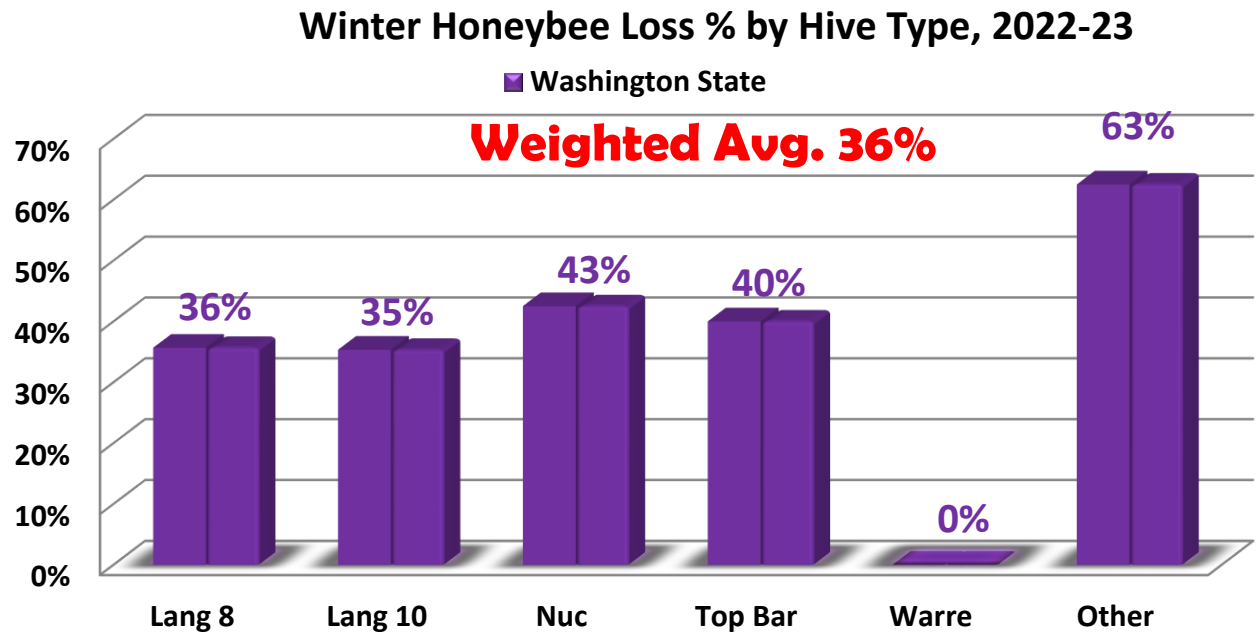


Response by local Oregon (OR) & Washington (WA) association varied as indicated by blue bars in Figure 1. Statewide loss level is highlighted with orange bar. The number of respondent

individuals is listed next to the association name. The bar length is the average club loss percentage for the year. Survey included 692 fall Washington beekeeper colonies.

2022-2023 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 120 total WA beekeeper respondents (677 fall colonies). Langstroth 8 and 10 frame beehives (90% of total) had lower average losses (35%) than the 40 fall nuc (43% overwinter loss). Four of 6 top bar hives were lost but the single Warré hive survived. Of the 16 total other hives only 5 were identified – as lng hives) – they had 40% loss level.



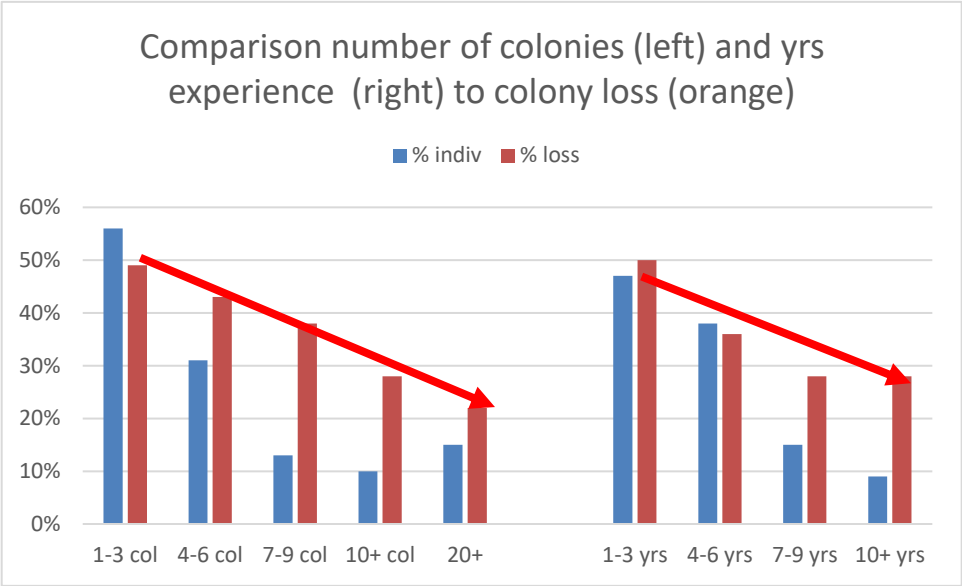
	Lang 8	Lang 10	Nuc	Top Bar	Warre	Other
Fall	143	467	40	10	1	16
Spring	92	302	23	6	1	6

The WA respondents to the electronic survey managed up to 38 fall colonies. Fifteen individuals had a single colony (and had colony loss of 33%), 21 respondents had 2 colonies (the greatest number) with 51% loss and 20 individuals had 3 colonies (50% loss). Typical of survey, fifty-six individuals (52.5% of respondents) had 1, 2 or 3 fall colonies (loss level of 49%). Thirty-one individuals had 4 to 6 fall colonies and had loss level of 43%. Four was median number. Thirteen individuals had 7 to 9 colonies, they had loss level of 37.5%. Ten individuals had 10-19 colonies with loss level of 28%, 6 individuals with 20-38 colonies had loss level of 28% (but there was an outlier

respondent who lost 23 colonies for 96% loss level – this group minus the outlier lost 21%. See Figure 3 (graph to left).

Forty-seven respondents (39% of total) had 1, 2 or 3 years of experience; they had a 34% loss level – individuals with 1-3 years experience had 50% loss. Thirty-eight individuals (31.7% of total respondents) had 4 – 6 years' experience (medium number = 4) with a 35.5% loss, 15 individuals had 7-9 years experience (loss level 28%), 10 had 10-18 years keeping bees and 40% loss level (but minus the outlier, a loss level of 15.5%) and 7 had 20+ years experience (40 was maximum) and they had a 23% loss level. Figure 3 illustrates - arrows are colony loss; blue bars represent percent individuals. Examining the relationship of colony numbers and years experience related to loss shows that loss of colonies decreases with the greater the number of colonies and/or years of experience.

Figure 3

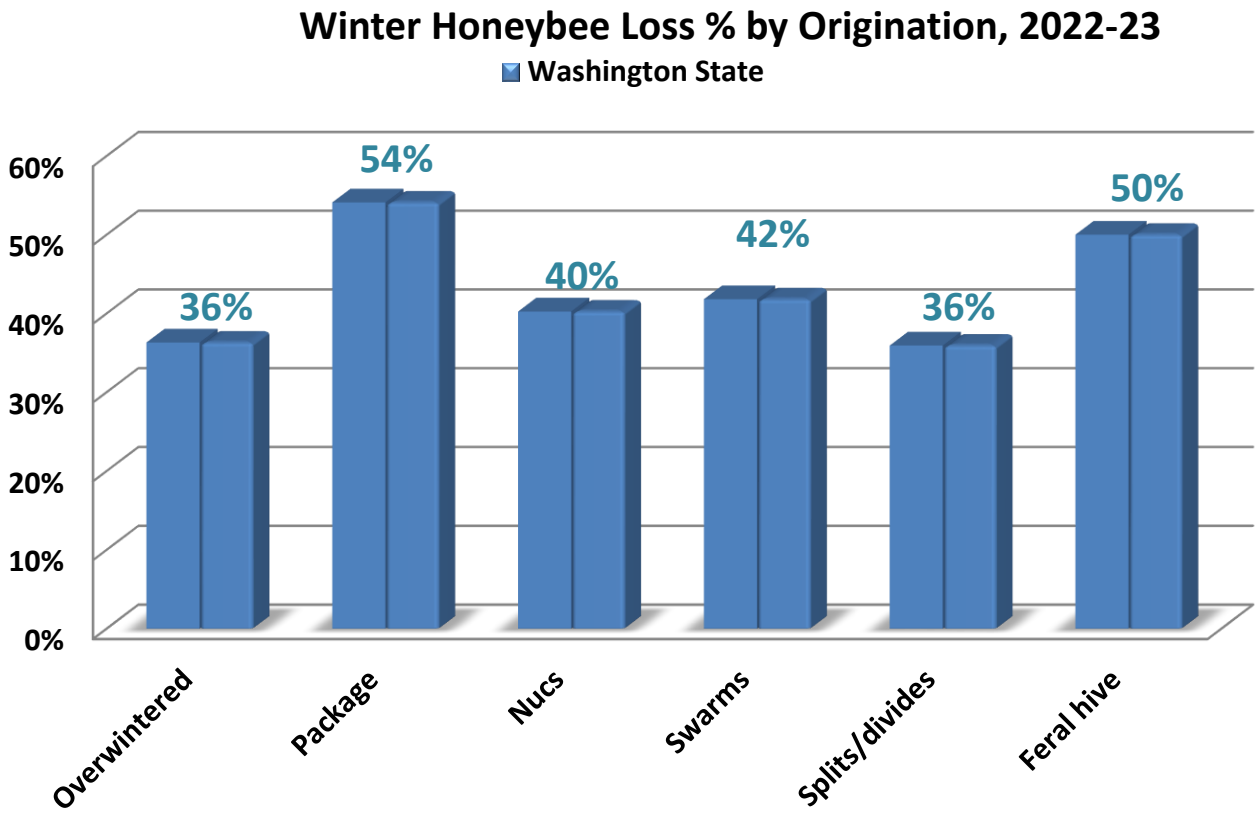


Eighty-six (72%) WA beekeepers had an experienced beekeeping mentor available as they were learning beekeeping. This percentage was 5 percentage points lower than last year, but similar to 5 year average.

Survival Based on Hive Origination

We also asked about hive loss by origination. Data shown in Figure 4. Best survival was previously overwintered colonies and splits/divides. Package bee losses were over 50%. Both swarms and nucs had about the same survival per respondents. Figure 4 below.

Figure 4



Fall	314	61	82	122	103	2
Spring	200	28	49	71	66	1

Among 120 WA beekeepers, 37 individuals (31%) had no loss and 30 individuals (25%) had total loss. Twenty-six individuals lost one colony, twenty-nine individuals lost 2 colonies (includes 4 individuals with 10+ colonies) and 10 individuals lost 3 colonies (one with 10+ fall colonies). 69% of beekeepers losing colonies lost one to three colonies.

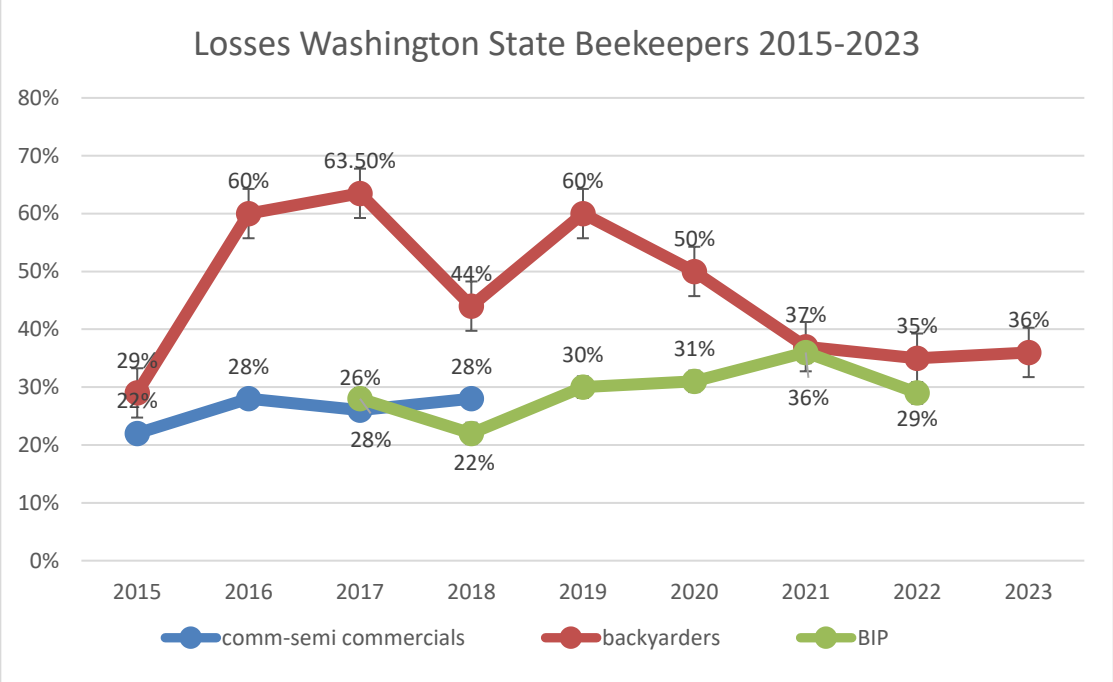
The loss for individuals with 1 to 9 colonies is shown in Figure 5 and losses of 16 individuals with 10+ colonies number in figure 6 Highest loss was 8 colonies except for one outlier. One individual with 20+ colonies lost all but a single colony, a 96% loss level. I have not included this outlier in the Figures 5 and 6 below.

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 7 below with approximate number of colonies represented by the commercial/semi-commercial beekeepers and number of individual backyarder survey respondents.

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. I think this is an artifact due to lack of a large commercial beekeeper response – The BeeInformed.org (BIP) losses for Washington beekeepers for 2019 were 30.13% from 133 beekeepers with 48,625 fall colonies. I believe the same issue (lack of representative responses) has provided unreliable commercial loss data for 2022 and 2023 from the PNW survey. The BIP survey results reveal a 35.14 loss percentage (83 beekeepers 33,307 col) in 2021 and 28.86% loss from 88 beekeepers with 72,684 fall colonies in 2022. With large numbers of colonies in survey data, the BIP losses reflect commercial losses not losses of backyarders.

Figure 7



#Comm hives	~40,000	33,200	16,604	29,015					
#backyarders	31	52	101	104	98	133	163	80	120
BIP				83,000	52,500	48.600	48,000	33,300	72,700

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 move 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). With large numbers of colonies in survey data, the BIP losses reflect commercial losses not losses of backyarders average 7-year BIP WA loss is 26.7%. To access this data, see https://research.beeinformed.org/loss-map/

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

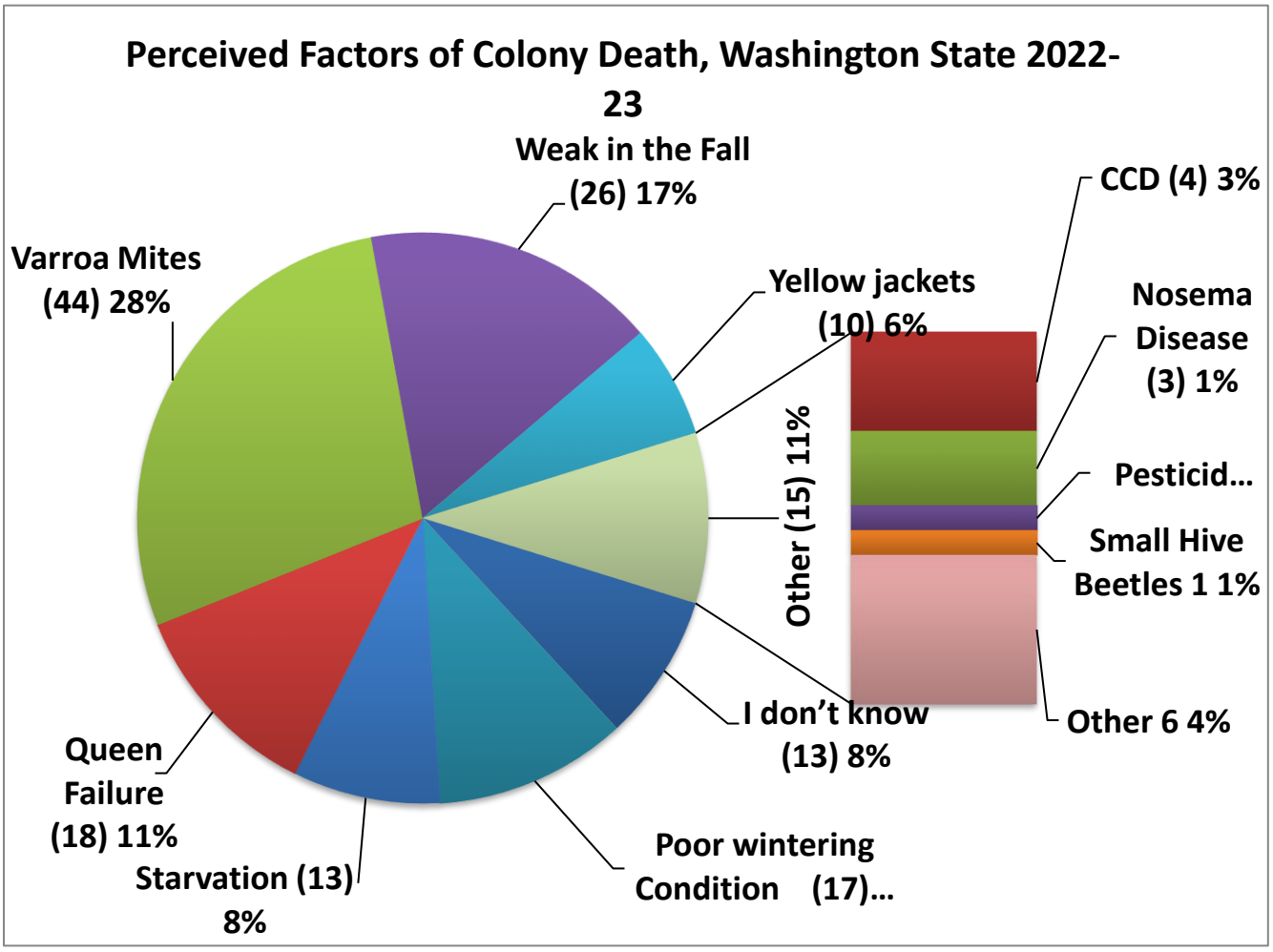
Acceptable loss: Survey respondents were asked reason for loss. Nine (12%) indicated zero (no loss). Fifty-seven percent of individuals indicated 10% or less. 10% was medium choice. Nineteen percent said 50% was an acceptable loss level. See table below.

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%

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 156 WA selections (1.85/individual) provided. Weak in the fall (26 individual choices) and Varroa mites (44) were the most common choices. Cold and mice (2 selections each), absconding and mite treatment were the other reasons given. Figure 8 shows the number and percent of factor selections.

Figure 8



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.

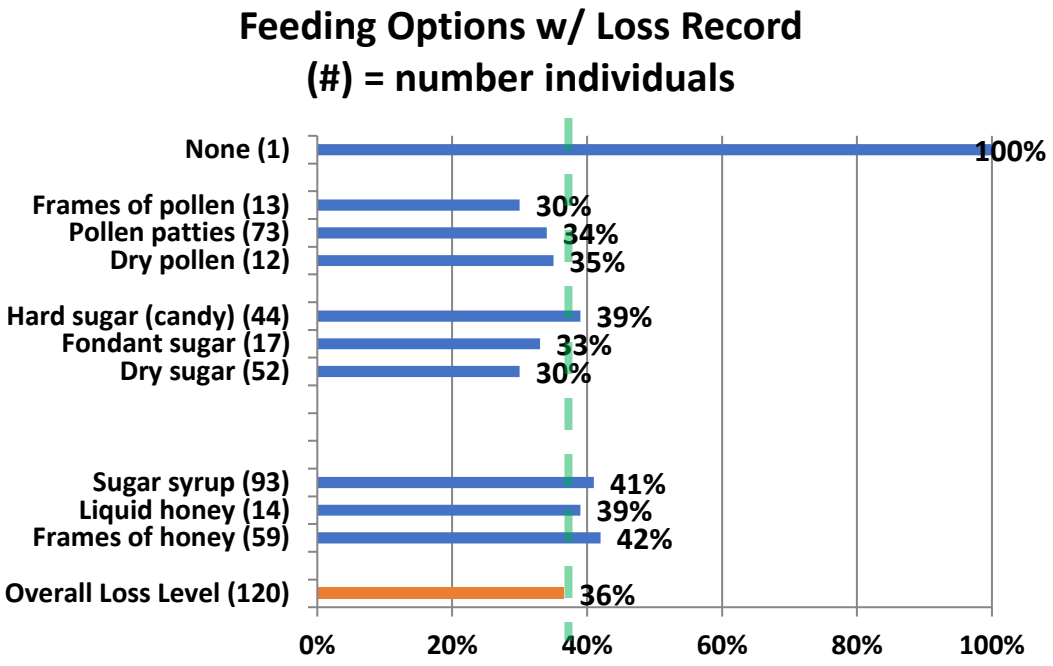
Most Washington beekeepers do not perform just one management to their colony (ies) toward improving colony health and overwintering success. This analysis compares a single factor equated with loss level. Such analysis is correlative and doing a similar management as fellow beekeepers does not necessarily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

FEEDING: Washington survey respondents checked 381 feeding options = 3.2/individual. One individual made no selections – they had one colony and lost it (100% loss). Thirteen respondents indicated a single choice and had 45% loss level. The best survival results were 3 or 4 selections. Table illustrates the relationship of number of selections to percent making selection (median was 3) and percent loss of those individuals.

The choices, with number of individuals making that selection, is in ( ), bar length indicates loss level of individuals doing this management (Figure 9). Those bar lengths to left of 36% (**green dashed line**) had better survival while those to right had greater loss level.

# selections	# indiv (%)	% loss
1	13 (11%)	45%
2	18 (15%)	26%
3	49 (41%)	45%
4	21 (18%)	24%
5	14 (11%)	42%
6-8	5 (4%)	42%

Figure 9



Feeding sugar syrup and pollen patties were the most common feeding option of respondents (93 and 73 individuals respectively). The loss rate of pollen patty feeders was 2 percentage points below state average. Best survival was feeding dry sugar (30%) and frames of pollen (also 30%).

For the last 6 years of survey losses statewide, individuals doing no feeding had poorer survival in 5 of the 6 years, this year one individual lost their single colonies. Individuals that fed sugar syrup had marginal lower loss level in four of six years (but not 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 6 years; this year 3 percentage point poorer survival. For individuals feeding protein, protein patty users showed slightly better survival in 4 of 6 years (including this year); dry pollen feeders had significantly better survival in four of the five years; this year only slightly better (a single percentage point difference) but number of individual respondents doing this management is not very large, this year 12 individual, 10%.

WINTERING PRACTICES: We received 330 responses (2.7/individual compared with 2.9/individual last year) reporting WA beekeeper wintering management practices (more than one option could be chosen). Six individuals (5%, same as last year) indicated none of the several listed wintering practices was done; these individuals had a single colony (of 14 total) survive winter, a 93% loss level. Last winter those doing no winter practices had an unusually favorable survival, 17% loss, while the year before it was a 74% winter loss.

For those indicating some management, 9 did one single thing and had 37% loss level. The best survival was those with 2 and 5 selections. Information presented in table to right.

# selections	# indiv (%)	% loss
1	9 (7%)	37%
2	42 (34%)	24%
3	30 (24%)	46%
4	7 (6%)	21%
5	4 (3%)	57%

The managements selected that improved survival were wrapping/using colony insulation (30 individuals – 30% loss level), use of Vivaldi/moisture trap (87 individuals, 32% loss) and equalizing hive strength (25 individuals, also 32% loss level). Figure 10 shows the number of individual choices and percent of each selection. Bar length below 36% (**blue dashed line**) had better than average winter survival.

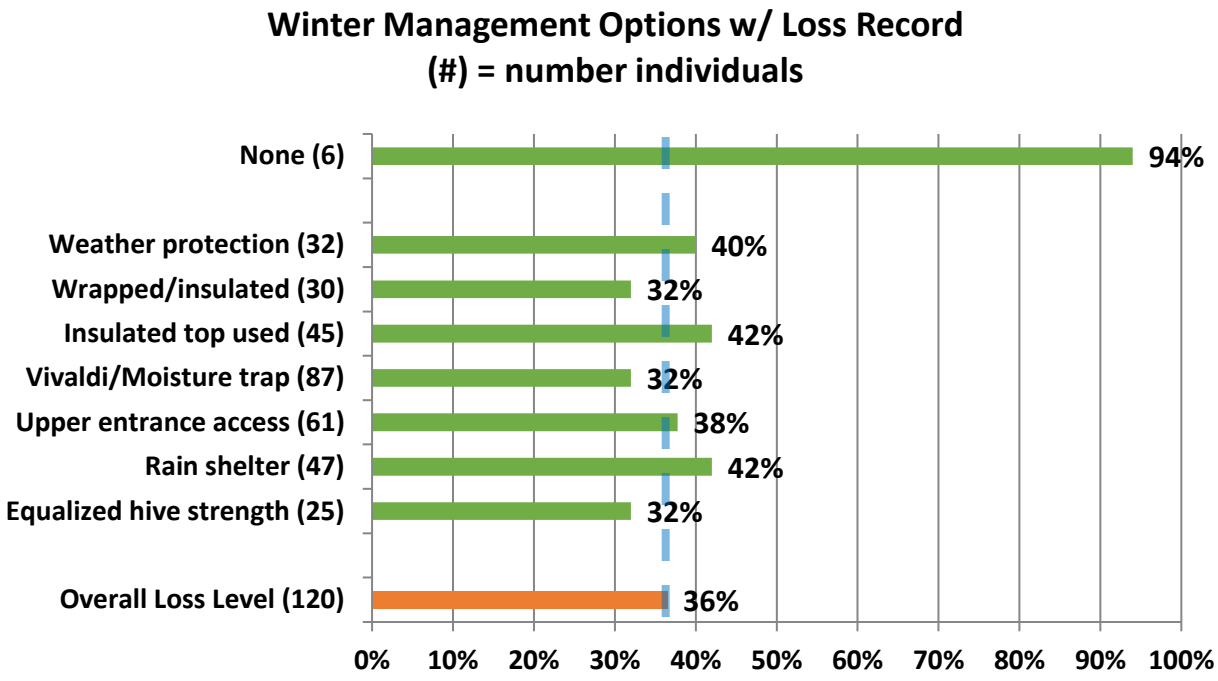


Figure 10

Over the past 6 years a couple of winterizing managements have shown improved survival. Those doing no winterizing had higher losses all 5 of 6 years (last winter was the exception). Equalizing hive strength in the fall demonstrated lower loss levels in all six recent winter periods (this year less than previous years) and top insulation has demonstrated lower loss in four of six winters but not this past winter; in the most recent winter 45 individuals had a 6 percentage point lower survival. Ventilation above the colony (Vivaldi Board/quilt box) demonstrated improved survival four of the six winters, this year a 2 percentage point better survival. The 3 individuals listing an other choice (closed upper entrance, added insulation or insulation tape at sides) lost only a single colony of six total.

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 244 responses for this survey question 2.7/individual (last year it was 2.3/individual). Twenty-two individuals (24%) said they did not practice any of the 6 offered alternatives; they had a loss rate of 26%, 9 percentage point lower than the statewide average.

# selections	# indiv (%)	% loss
1	22 (24%)	26%
2	34 (3%7)	35%
3	14 (15%)	47%
4	18 (20%)	48%
5	2 (2%)	50%

Twenty-two individuals had 1 selection and had 26% loss average, the best of the total. 34 made 2 choices with 35% loss, while the rest had considerably higher loss levels. It is clear than none of the measures is robust enough to make a difference by itself in reducing winter loss. Figure 11 shows the number of

individual choices and percent of each selection. Bar length below 36% (**green dashed line**) had better than average winter survival.

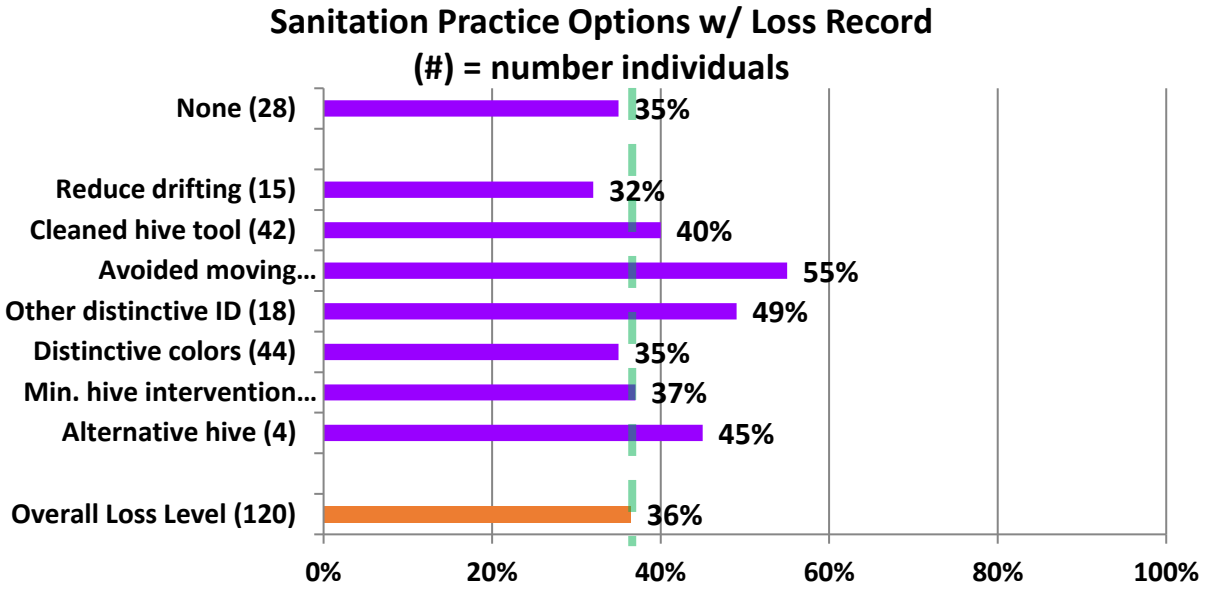


Figure 11

In all five years doing none of these managements resulted in better than average survival; this was the case this past winter when the 28 individuals doing nothing had average statewide losses. The 15 individuals reducing colony drift had a 32% loss level, 4 percentage points better than statewide. Providing hives with distinctive color/distinctive hive ID measures were helpful managements with losses just under 5 percentage points either side of average in all six 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 19 Washington individuals (16%) said they did not use screen bottom boards; they lost 29% of their colonies. Those 24 beekeepers using SBB on some of their colonies lost 42% and the 77 individuals (64%) using SBB on all of their colonies had 36% loss.

In 7 survey years 20% of Washington beekeepers said they did not use SBB and 80% did

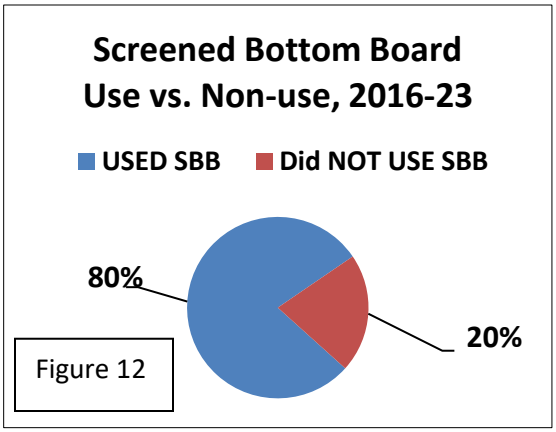


Figure 12

use SBB on some or all of their colonies, see Figure 12.

Examining the seven year average of SBB use, those using SBB on all or some of their colonies had a 41.1% loss level whereas for those not using SBB the loss rate was 41.3% (a 0.2% 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.

We asked if the SBB was left open (always response) or blocked during winter season. Sixty-three individuals (62%) said they always blocked SBB during winter. They had a 37.5% loss rate. Twenty-eight individuals (28%) said they never blocked SBB and had loss rate of 34.5%. Ten individuals (10%) blocked them on some of their colonies. Their loss rate was 54%.

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 (39% loss level) with the closed in winter response (37.5%) reveals a 1.5 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 an 8 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 fondant during the winter meant lower loss levels. Providing honey or sugar syrup, the most common selection, did not mean lower winter loses 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 any form 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 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 are of some value in reducing winter losses.

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 2022 year and/or overwinter 2022-23, 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. Eighty-one individual respondents (67.5% - a decrease of 1.5 percentage points from last year) said they monitored all their hives. Losses of those individuals monitoring was 33%. Twenty-one (17.5%), reported no monitoring; they had a higher loss rate of 43%. Eighteen individuals monitored some with loss rate of 40%.

In order of popularity of use, 64 individuals used sticky boards, 64% total of 99 individuals who did some or all monitoring of colonies, looking on adults was indicated by 54 individuals (54%) who did some or all colony monitoring followed by 41 individuals (41% of individuals doing monitoring) that used alcohol wash. Forty individuals used drone brood monitoring and 17 used powder sugar to monitor In terms of losses, the sticky board users had 27.5% loss, alcohol washers had 36.5%, as did those looking a drone brood, worker inspection had 39% and powdered sugar users had the highest loss level at 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 13 below y illustrates by months when each of the 5 sampling methods were used.

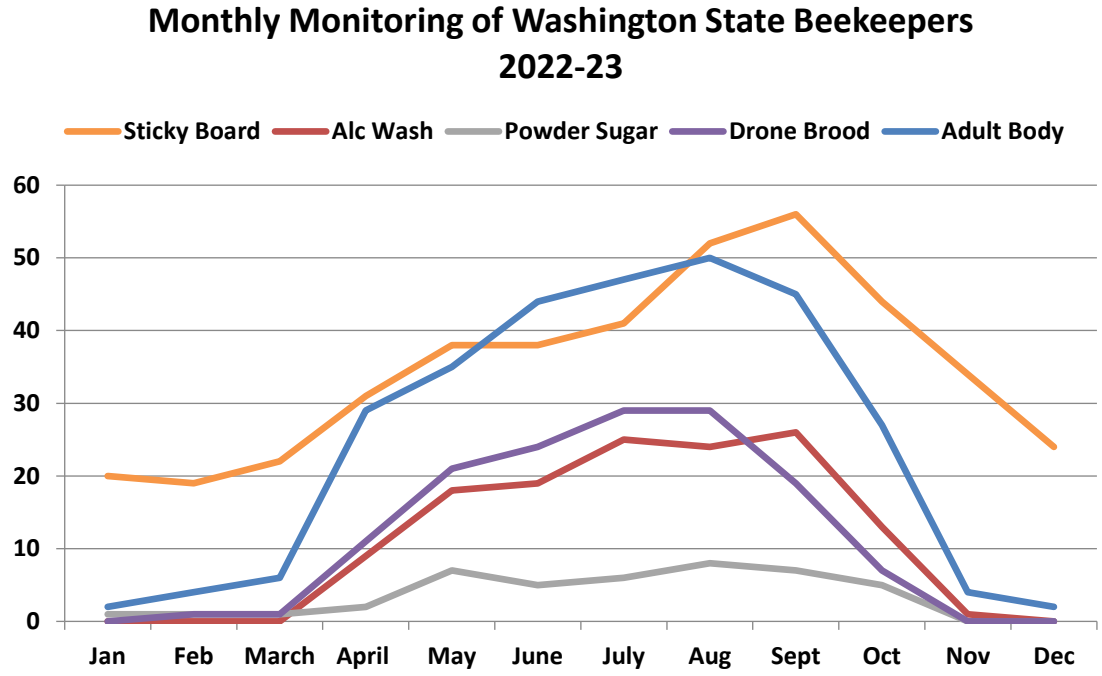


Figure 13

The most common sampling of respondents in 2021-22 was sampling both pre and post (45 individuals 38% of respondents); they had 37% loss, average for the 120 Washington beekeepers. Those 19 sampling pre had a 37.5% loss while those 6 sampling post had a 22% loss (this has been the lowest loss level selection each of last 2 years). Individuals neither sampling nor treating (21 individuals) had heaviest loss 43% while those treating but not sampling (28 individuals) had losses of (33%). The one individual that sampled but did not treat lost all 4 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

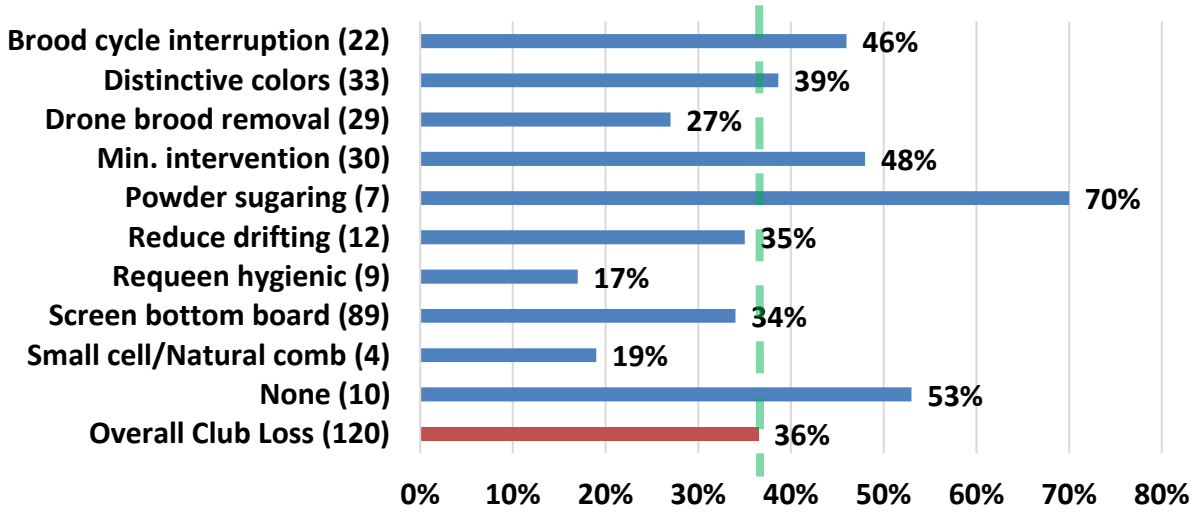
The survey asked about non-chemical mite treatments and also about use of chemicals for mite control. Ten individuals (8%) said they did not employ a non-chemical mite control and 3 individuals (2.5%) did not use a chemical control. Those 13 individuals who did not use a non-chemical treatment reported a 53% winter loss, while those who did not use a chemical control lost 50% 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,) 235 selections were indicated 2.1/person (last year 2.2/individual). Thirty-eight individuals used one method and had a 47% loss, thirty-eight used two (36.5% loss level), twenty used three (26% loss), ten used four (33% loss) and three used 5 and 1 indicated 6 choices, they had 14% loss.

Use of screened bottom board was listed by 89 individuals (81% of individuals selecting other than none). They had a 33.1% loss level. The best survival choices were requeening with hygienic stock (17%), small cell/natural comb (18.5% loss level and Drone brood removal (27% loss. The use of the

Figure 14

Loss Rate using Non-Chemical Mite Control
(#) = number individuals



remaining 7 selections are shown in Figure 14; number of individuals in ( ), bar length represents average loss level of those individuals using each method. Those to left of **the green dashed line** had better than average survival.

Two of the non-chemical alternatives – drone brood removal (29 individuals) and brood cycle interruptions (22 individuals)- have also been useful in previous year surveys in reducing winter losses(in some of past 6 years but not all) but brood removal this year did not improve survival. Painting hives with distinctive colors has resulted in better survival in each of the past four survey years but not this year. Small cell/natural comb has not been demonstrating better survival but did last year (but only by 3 percentage points) and this year for the 4 individuals (19% loss level).

Chemical Control: For mite chemical control, 6 individuals (2.5% of total respondents) used NO chemical treatment; these individuals had a 50% loss level (those doing no treatments lost 67% last year). Those using chemicals used at rate of 1.9/individual. Forty-nine individuals (45%) used one chemical and had 35% loss, 39 used two and had 37% loss, 18 used 3 (38% loss), 6 used two and had 20% loss while the 2 using 5 had a 13% loss level.

Within those numbers there are some other patterns. For those using one chemical the use of oxalic by 26 individuals had a 26% loss, the 4 using formic had a 19% loss while 5 using Apivar had a 70.5% loss. Within the group using 2 choices (the medium) 10 used both Apivar and Oxalic vaporization and had a 42% loss, the 9 using Formic and OAV had a 26% loss and the 5 who used both ApiLifeVar and OAV had a 36% loss, the statewide average. For the 8 using 4 or 5 choices, all but one included oxalic acid – one who didn't use oxalic had a 67% loss, those who did include it a 14% loss. It appears OAV or OAE (30 individuals, 25% of total chemical intervention users) used by itself or as a combination with formic gave the best overall results.

Figure 15

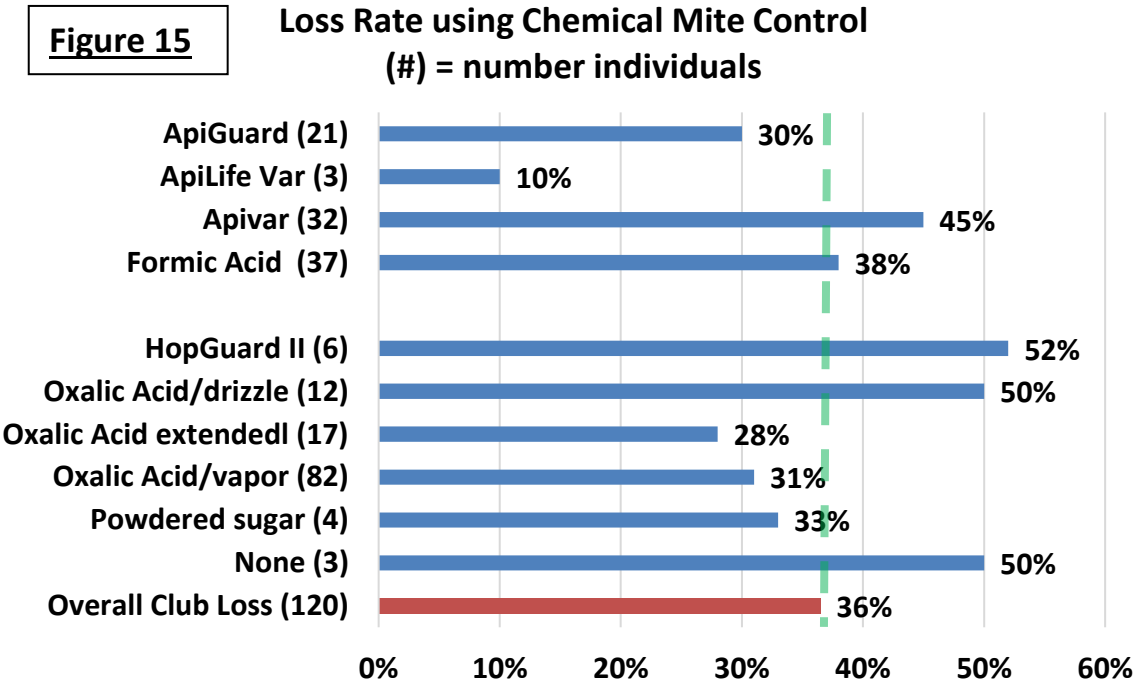
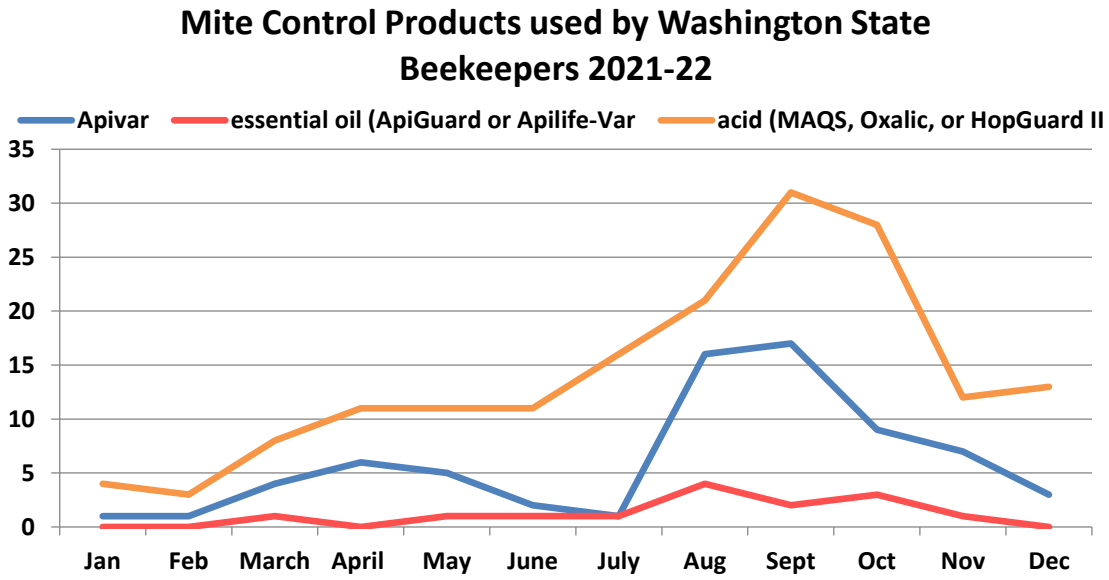


Figure 15 illustrates the number of uses ( ) and bar length indicates the loss rate for those using that chemical.

Consistently, the last 6 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 30% and 10% loss levels (last year no responding Washington beekeeper reported use of ApiLifeVar). Over the last six years Apiguard users had a 33.5% better survival rate. Apivar, the synthetic (amitraz), has demonstrated a 36% better survival over past 6 years (2017-22) but this year was 9 percentage points less survival compared to statewide.

Oxalic acid vaporization over past 5 years has a 17.5% better survival (the survey did not differentiate Oxalic vaporization from drizzle prior before 2018); this year just a 5 percentage point difference. Formic acid also normally provides better survival but this year did not, a 2 percentage point poorer survival.

The monthly use of Apivar (blue line), essential oil (red line) or an acid (green line) is shown in Figure 16 for last year. Further review is needed to determine if the timing of treatments was more effective than at other times for the various chemicals.

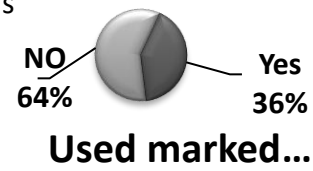


Antibiotic use

Four individuals used Terramycin and had a 23.5% loss level. One person indicated the use of both terramycin and tylosin and their 2 colonies both survived. Eight individuals indicated the use of Fumagillin (Fumidil-B) for Nosema control; their loss rate was 25.5%.

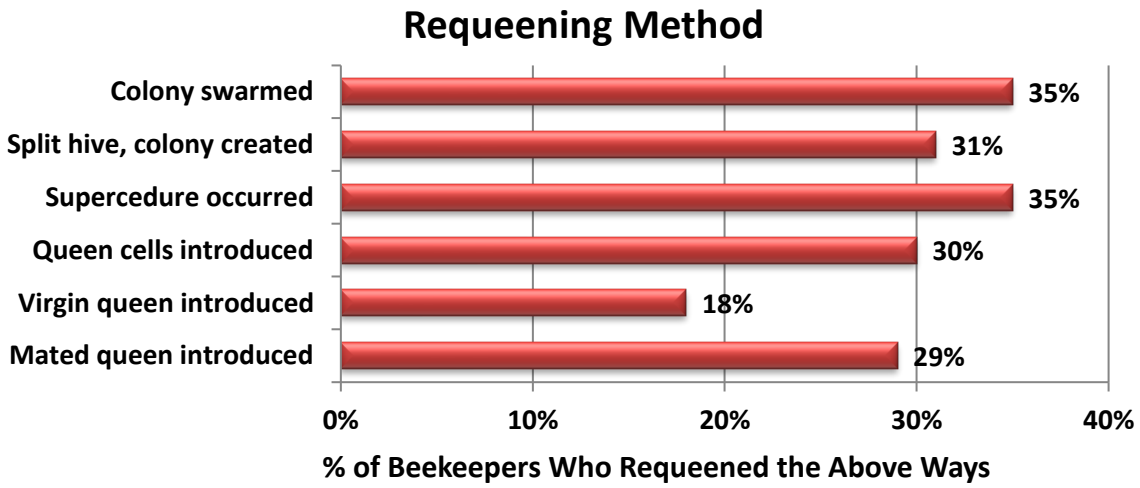
Queens

We hear lots of issues related to queen "problems." Eleven individuals indicated queen problems as reason for loss in earlier part of survey. 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. Forty-three individuals (36%) said yes. The related question then was 'were your hives requeened in any form?' to which 69% (83 individuals) said yes, 16 said no (12.5%) and the remainder 'not that that I am aware of.' Loss level of yes was 33% of the nos 29% and not aware of was 43.5%.



Used marked…

One technique to reduce mite buildup in a colony is to requeen/break the brood cycle. The question "How did bees/you requeen" received 161 responses (more than one option could be checked). Thirty-nine individuals indicated they requeened with a mated queen and they had a 29% loss level, two used a virgin queen (18% loss) and 17 used a queen cell (29.5% loss). Twenty-eight said they split their hive(s) 31% loss, 43 indicated their colonies swarmed 35% loss and 32 said supersedure occurred – they had a 35% loss. Loss levels of colonies that did it themselves were not as favorable as those whose queen replacement was managed by the beekeeper.



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 June 2023