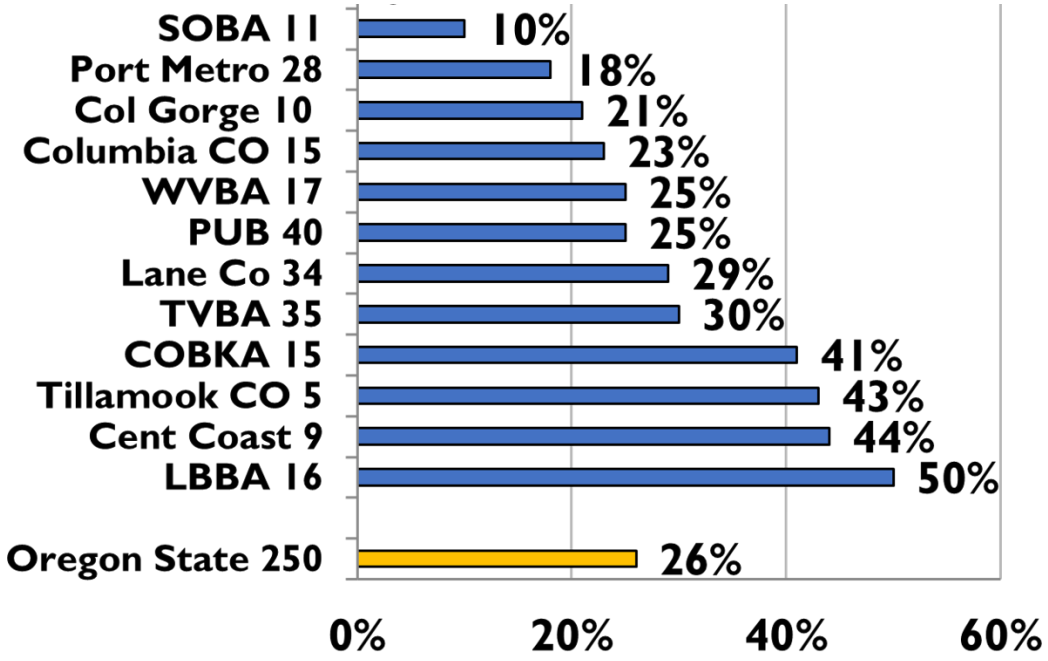
Winter Bee Losses of Oregon Backyard Beekeepers for 2024-2025

by Dewey M. Caron

Overwintering losses of small-scale Oregon backyard beekeepers remained low this season (25.5%) following the record low 20% the previous winter of Oregon hobbyist/backyard beekeeper surveys. - www.pnwhoneybeesurvey.com. Herein we discuss the data provided by 251 Oregon beekeepers, an increase of 80 from the previous year and 31 below the average response rate of 282 respondents for the last 6 years. **Overall loss rate was 25.5%.** Results of the 130 Washington respondents completing surveys (slightly above the average response rate of the last 6 years of 120) are included in a separate loss report. The Washington average loss was 34%, just a bit above 31% loss rate last year.



State/Club Losses

The Bee club results of 12 local Oregon associations are shown in Figure above. Individual colony numbers ranged from 1 to 49 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 the 12 clubs varied from a low of 10% for SOBA (11 respondents) to 50% for LBBA (16 respondents). Losses for clubs (and number of respondents) not shown in Figure are: Coos Co (3) 7%, Douglas Co (2) 9%, Eastern OR (3) 47% and Klamath Basin (3) 87.5%. The 5X extreme range (10 to 50%) loss of the dozen clubs with the largest respondents is more

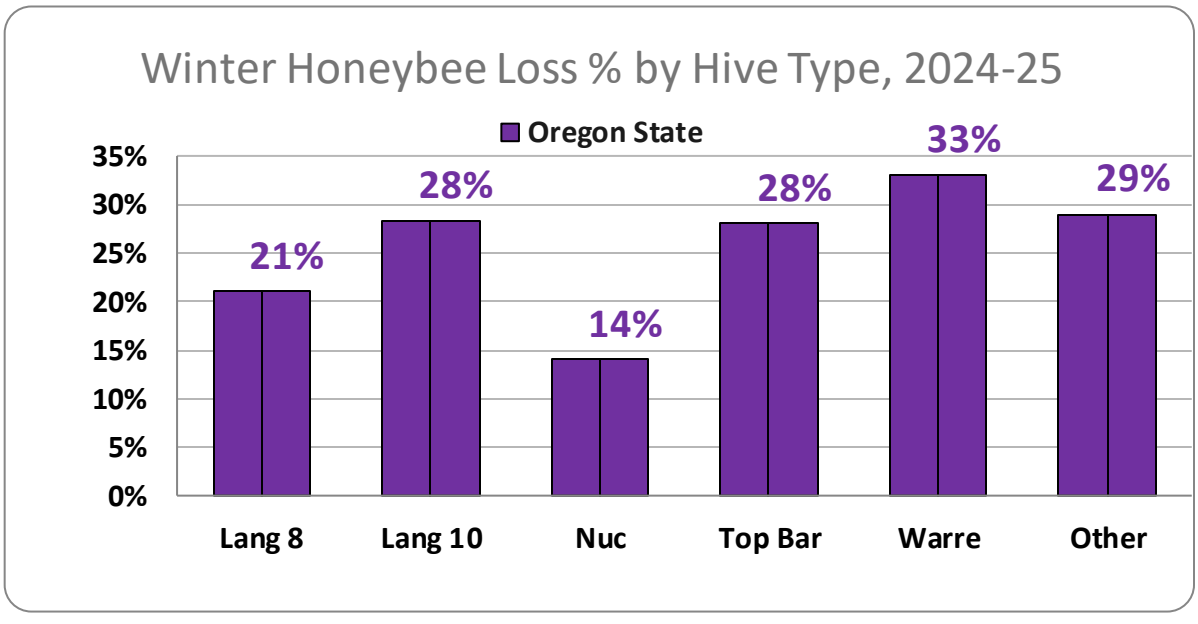
extreme than in previous seasons (previous range 4X). Approximately 80% of respondents are roughly along the I-5 corridor between California and Washington.

2024-2025 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 1393 fall hives (405 more compared to the respondent number last year) of which 1038 survived to spring (355 lost), equating to a 25.5% loss (74.5% survival rate). This was 5.5 percentages points poorer survival compared to the previous winter loss rate. It was lower than the 15-year average loss rate by 10.1 percentage points.

All but 70 were 8-frame, 10-frame Langstroth hives, nucs or (15) long hives. There were 51 fall nucs (13.7% loss rate). Among non-traditional hive types were 29 top bar hives (27.6% loss) and 9 Warré hives (33% loss). Other hive types in addition to long hives included 8 Layens, 1 AZ, 1 Valkyrie; 2 tree; 15 were not identified to type. Of 41 total other, 12 were lost for 29% loss level.

The loss rates of Langstroth 8 and 10 frame hives over the past 9 years have averaged 34.3% for 8-frame Langstroth hives and 38.7% loss for 10-frame hives respectively. Nuc losses are typically higher than losses of 8 or 10-frame Langstroth hives but were lower this year. The Nuc 9-year average loss is 40%. This year's Top Bar hive loss of eight colonies (27.6%) is below the 9-year average top bar hive loss of 48%. The 2024 Warré hive loss rate of 33 % is below the 8-year average of 40%.

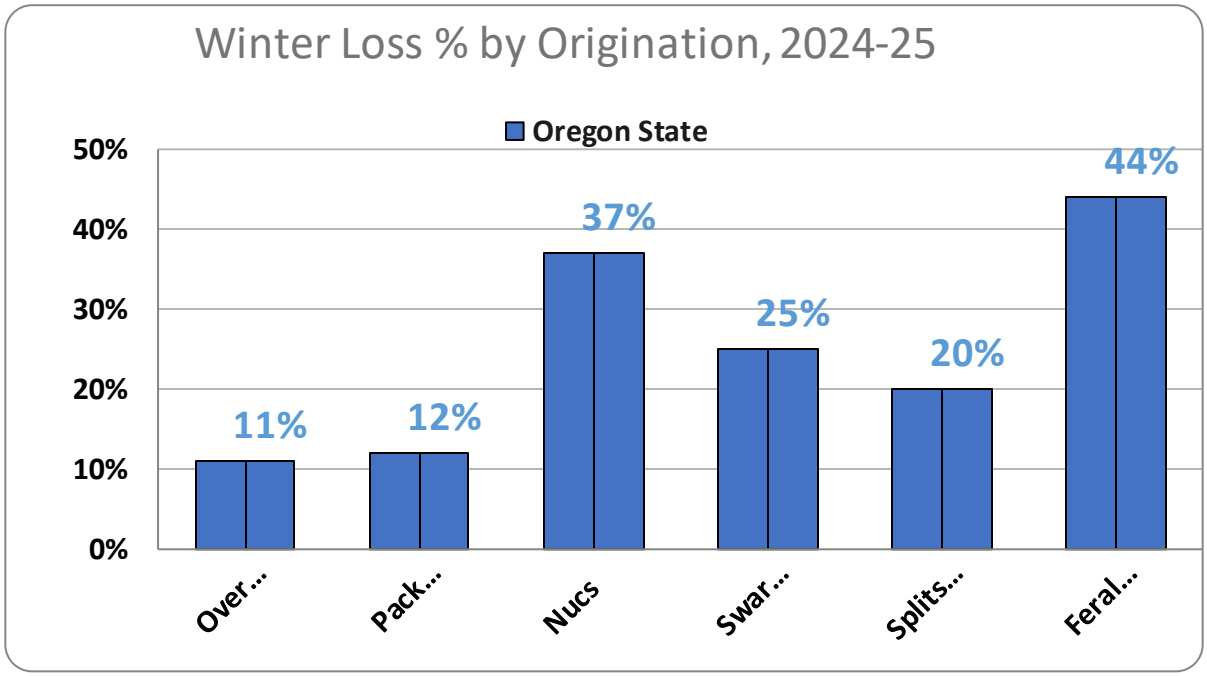


Fall	393	869	51	29	9	41
Spring	312	626	44	21	6	29

2024-2025 Loses Based on Hive Origination

The survey asks respondents to characterize their loss by hive origination. This year respondents could FAST TRACK and 54% of respondents did not respond to this survey question. The results of respondents are graphically presented below. Overwintered colonies obviously had the best survival (11%) as is normally the case and it was well below the 31.9% average overwinter loss average for the past 7 years. Packages also had excellent survival 12%. Nuc losses of 37% were below the 7-year average of 52.6%. Swarms and splits had good survival. Only 9 feral colonies were reported.

Figure 3



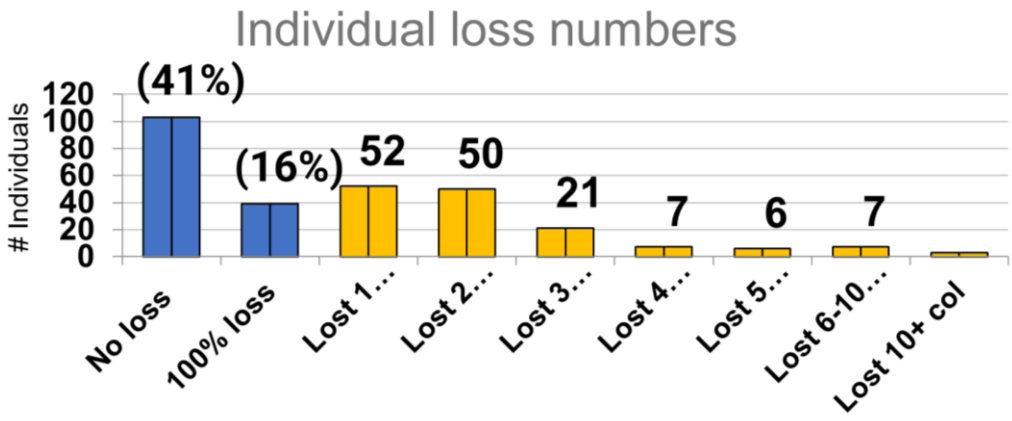
Fall	347	26	87	145	148	9
Spring	308	23	55	109	119	6

2024 -25 Individual Hive Losses

Forty-one percent (103 individuals) of Oregon respondents had NO LOSS overwinter (total of 470 colonies), a decrease of 6 percentage points and increase of 22 individuals compared to last year. Fifteen and half percent (39 individuals – 88 colonies) lost 100% of fall colonies. Figure 4 below shows loss by individuals. The loss of a single colony (by 52 individuals) represents 35% of total individuals reporting loss. Three individuals (2%) lost ten or more colonies. The highest loss by a single beekeeper was 12 colonies. Numbers shown in figure 4. Loss numbers are reflective of the fact that the median number of bee colonies of backyarders was three colonies.

Individuals with 1, 2 or 3 colonies, 132 individuals, lost 120 colonies = 34% loss level; individuals with 4 to 6 colonies, 216 total colonies, lost 22%. Fifty-six individuals with 4 to 6 colonies lost 27.5% of their colonies. The 28 individuals with 7 to 10 colonies lost 28% of their colonies as did the 21 individuals with 11 to 19 colonies. The 11 Individuals who had 20+ had 19% loss level. The two individuals with greatest colony numbers 34 and 49 colonies.

Figure 4



Survey respondents are primarily small colony number beekeepers – 52.5% had 1-3 colonies (132 individuals) but they vary considerably in their years of beekeeping experience. Looking at losses by colony numbers, the 58 of the 132 individuals who had 1-3 colonies, had 1-3 years of experience. They lost 50.5% colonies. Maximum was 20 years experience for 1 colony beekeepers, 21 years experience for 3 colony beekeepers and 47 years experience for 2 colony beekeepers.The 37 individuals who had 4-9 years experience had 38% loss. The 20 individuals who had 10-19 years experience had 32% loss level and those individuals with 20+ years experience had 16% losses.

By years of experience, the 72 individuals who had 1 to 3 years bee experience (29% of total respondents) had 33% colony loss level and the 64 individuals with 4-6 years experience (25.5% of survey takers) had a 24% loss level. Individuals with 7-9 years expereince, 17,5% of total respondent number, had 23% loss level. The 53 individuals with 10-19 years experience (21% of respondents) had a 22.5% loss level and those 18 individuals (7% of respondents) with 20+ years experience had a 31.5% loss level. Thus the 48% of survey respondents with 1-6 years experience had an 26.5% loss level and the 52% that had 7+ colonies had 32.5% loss level.

Overwinter Losses the Past 16 Seasons

Comparison of the annual losses of backyarders with commercials is shown in Figure 5. The commercial losses are obtained from a different paper survey distributed by Oregon State University. The number of commercial respondents (5 commercial and 2 sideliners) is preliminary as of May 1; reported losses on only 22,400 colonies (NASS estimated colony number in Oregon (2022) =76,000.

This preliminary loss rate is 47.8%. Average backyard losses =36.3% loss and 15-year commercial/semi-commercial loss = 21.4%. The BeeInformed average (14 years) =25.4%; in 2024 the national survey was conducted by a consortium of Apiary Inspectors of America/Auburn University and Oregon State University. The 2024 winter loss was 37.7%: preliminary overwinter losses for 2024-25 = 42%

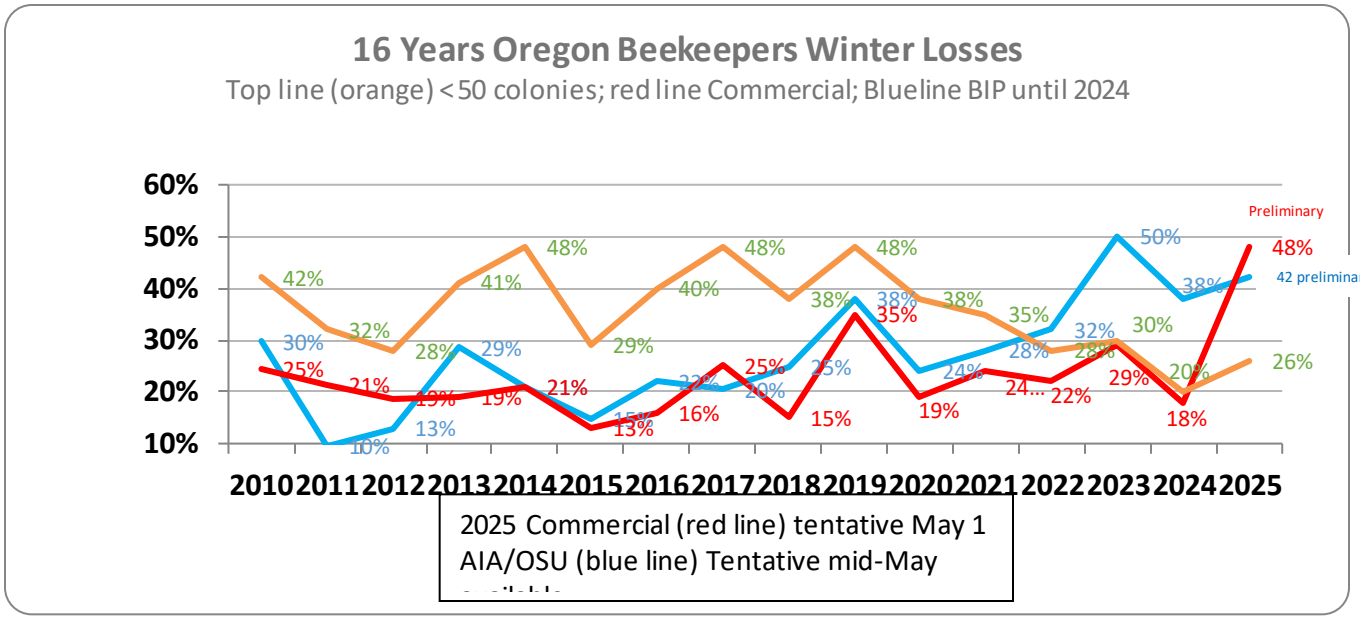


Figure 5

Some Other Numbers

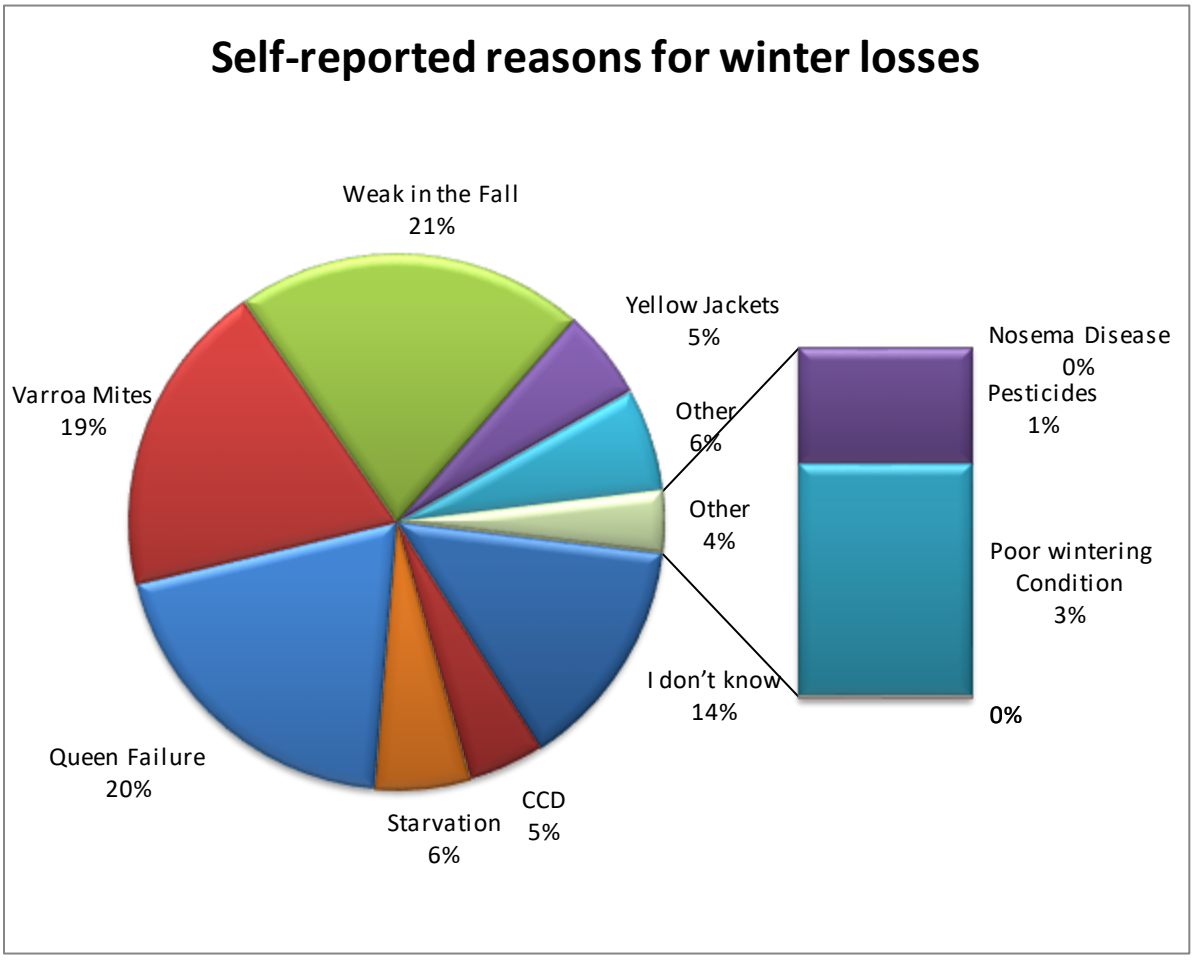
Thirty individuals (12%) had more than a single apiary location. The loss level at 2nd apiary was same in 16 locations, had lower losses in 8 and in 6 it was poorer survival. Six individuals had a 3rd apiary site with 2 reporting the same survival, 3 better and 1 poorer. Seventy-seven-point seven percent (77.7%) of respondents (same as last year) said they had a mentor available as they were learning beekeeping. Seventy-eight individuals (31%) had more than one hive type, same percentage as last year but 24 more individuals. And, finally, 12 individuals (5%) moved their bees. One move was sale/gifting of hives, one was due to owner move, one was due to allergy of owner where bees were sited, 3 were for pollination, 1 for better honey, 1 was for better winter site, 1 was a hive gift, and 3 involved new locations of beekeeper. Distances were within the 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 (99 individuals listed no loss) to estimate what the reason might have been for their loss (multiple responses were permitted). Thirty-four listed don't know. There were 167 total listings, 1.85/individual. Queen issues (48), weak in the fall (51) and varroa (46 individuals) were most common. Starvation, 14 selections and yellow jackets, 13 respondent choices, along with CCD (11 selections) were three additional double-digit choices. Among the 15, 3

indicated absconding, 2 indicated extreme cold and rain, another cited lack of attention (it was termed beekeeper error), one each said poor stock, robbing, tracheal mites, use of Formic Pro, entrance clogged, moisture, uniting problem and virus. See Figure 6 graph below.

Figure 6



Acceptable loss: Survey respondents were asked the reason for loss. Forty respondents (16%) indicated zero (no loss). Twenty percent was the medium and most common choice (outside of zero) choice, as has been the case for several years. Fourteen percent said 50% or greater was an acceptable loss level; six said 75% and 3 said 100% loss levels acceptable. See Table below.

Acceptable Loss % 2024-25											
Loss level	**5%**	**10%**	**15%**	**20%**	**25%**	**33%**	**50%**	**75%**	**100%**	**None**	**Other**
#	21	29	13	42	38	27	27	6	3	40	0
%	8%	12%	5%	17%	15%	11%	11%	2%	1%	16%	

Why do 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 acceptable choices varied from zero to 100%, with a 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 viruses. But we do not have a test for these viruses. It was interesting that weak I the fall and queen problems were the most frequently indicated along with varroa mites 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 overall losses this past year, 25.5%, were still at a low level. More attention to colony strength and the possibility to mitigate colony weakness in the fall 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. This year individuals could FAST TRACK through the electronic survey and not answer the questions on management. 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. The report seeks to compare responses of the current winter season with previous survey years. The percentage of individuals that opted to FAST TRACK are indicated for

each section. For example, 78 individuals or 31% Fast TRACKED this first section on Feeding, Winterizing and Sanitation.

FEEDING: Oregon survey respondents checked 507 feeding options = 3.4/individual (same as last year). Twenty-one individuals (12.5%), other than the 6 who indicated no feeding, selected a single choice and had 16% loss, 38 (23% of respondents) indicated 2 choices (31%, loss), 53 (32%- the greatest number and medium) indicted 3 choices (they had 23% loss), 31 individuals (18.5%) had 4 choices with 23% loss, 15 (5.5%) had 5 choices (21 % loss), 6 individuals (3.5%) had 6 choices also had a 21% loss. And two individuals with 6 & 7 7 selections had 28.5% loss. There were 7 total who listed selections; 5 of those indicated using hive alive – they had 9% loss, the other two added peppermint (no loss) and the 7th indicated use of MegaBee but loss was 75%.

The managements with number of individuals making that selection are in ( ) in Figure 10; bar length indicates loss level of individuals doing this management. Those bar lengths to left of 26% **green dashed** marker had better survival, while those to right had greater loss level. Six individuals (1 more than the previous year – but recall only 70% of total respondents submitted data) said they did NO FEEDING. They had 25 fall colonies, lost only five for a 20% loss, the best survival of any group for feeding management. For individuals indicating one or more feeding managements, feeding sugar syrup was the most common feeding option of respondents (139 individuals, 83% of respondents who indicated feeding management). Their loss rate was 21.5%, 4 percentage points better than the overall average.

Individuals feeding protein 100 individuals (60% of respondents) had an overall survival rate of 23%. Pollen patty feeders (92 individuals, 55% of total respondents, 3 % fewer than last year) had a 22% loss rate, 9 individuals feeding frames of pollen had 34½% loss and 9 feeding dry pollen reported a 20.5% loss (best survival of the 3 methods of feeding protein). There were 200 instances of feeding non-liquid sugar feeders, 53 fondant feeders and 47 candy feeders. The best survival rates were the 47 candy feeders, only 15% loss. The 42 dry sugar feeders had 18% loss. The 11 drivert and 53 fondant feeders did the poorest of the group, 26% and 28% loss levels respectively.

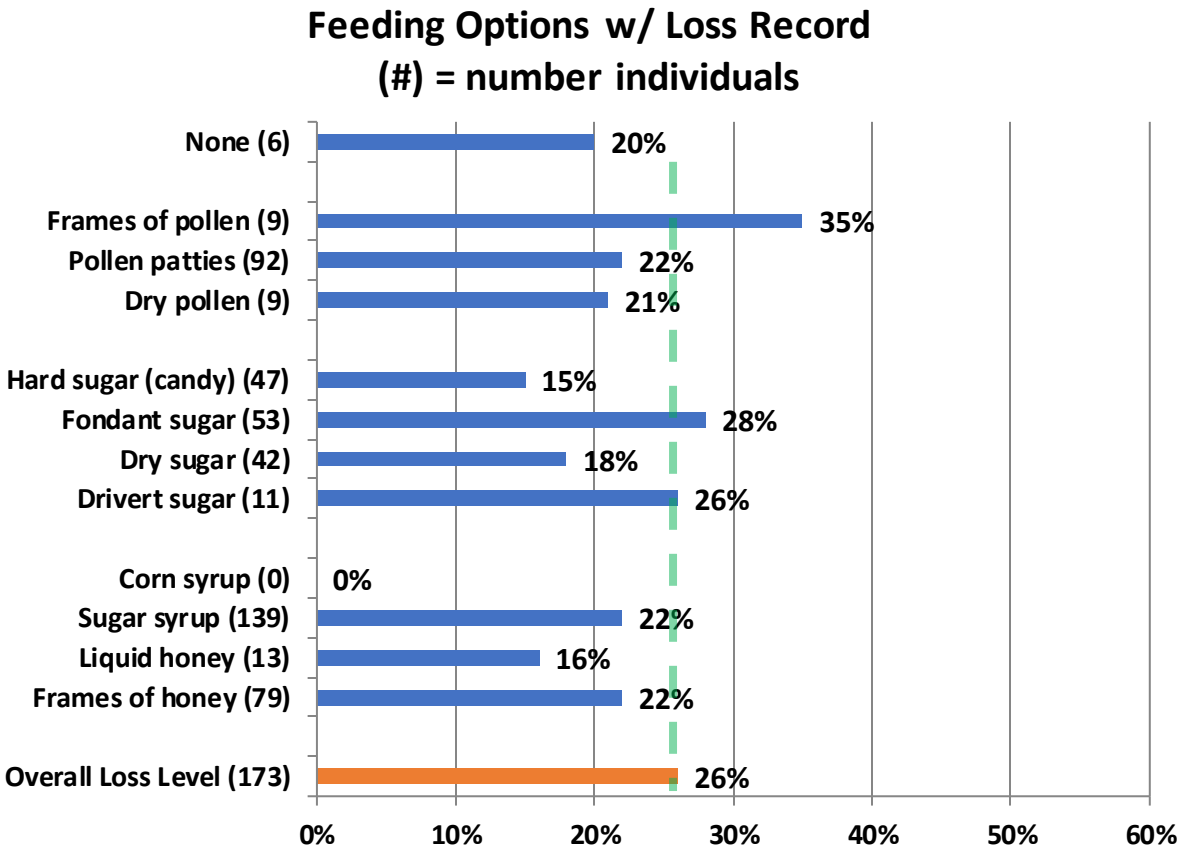
Summary: Statewide for the last 8 years individuals prior to this year when 31% of respondents FAST TRACKED and did not provide information on this management, who did no feeding had only a 4.5 percentage point higher loss (average 40.5%) i.e. poorer survival, compared to an average loss rate of 35%. This year the 6 individuals doing NO FEEDING had better than average survival (20%). The average percent doing no feeding = 6.5% of individuals – this year it was 3.5% of responding individuals).

Individuals statewide that fed sugar syrup had a 3.8 percentage point lower loss level average for the 8 years; this year it was 4 percentage point lower survival. Those feeding honey (as frames or liquid) had lower loss only during three of the past 8 years. This year it was a four-point better survival;

The 13 individuals who indicated feeding liquid honey had a 16% loss rate, a full 10 percentage points better than average survival rate.

Individuals feeding non–liquid sugar (in any form) had lower losses six of past eight past winter seasons. Dry sugar feeders had slightly better or equal survival 7 of 8 past winters and this year, with 18% loss, did better as well; hard candy feeders had improved survival 7 of 8 past winters, including this past winter, with the best survival of all dry sugar feeders at 15. Fondant feeders had better survival four of the eight past winters; it was slightly lower survival this year.

Figure 7



For individuals feeding protein, the protein patty users have had better survival 6 of 8 years (this year losses were four percentage points better than average); dry pollen feeders had better survival in three of the past eight years and this year had the second best survival level of all protein feeders at 22% this year.

It is clear that feeding, while a beneficial management, does not, by itself, significantly improve overwintering success. Those doing no feeding have generally had a higher loss with an 8-year average of 4.5 percentage points higher loss than average, but this year was an exception.

WINTERING PRACTICES: We received 162 responses (1/individual down from 2.5/individual last year) about OR beekeeper wintering management practices (more than one option could be chosen). Ten individuals (6 %) of the respondents indicated doing none of the several listed wintering practices; last year the same percentage of individuals had an elevated 44% winter loss, more than double overall loss but this year they lost only a single colony of 35 in the fall – a 3% loss, 97 % survival rate. For those indicating some managements, 26 individuals (16%) did one single thing, (30.5% loss), 44 respondents (27%) did 2 (17% loss) – this was the largest selection and also the best survival rate, 40 individuals (median number) did three of the winter managements (27% loss), 32 did 4 (24% loss), 16 did 5 (20% loss) and 4 did 6 or 7 with 31% loss. Doing more did not ensure overwintering success.

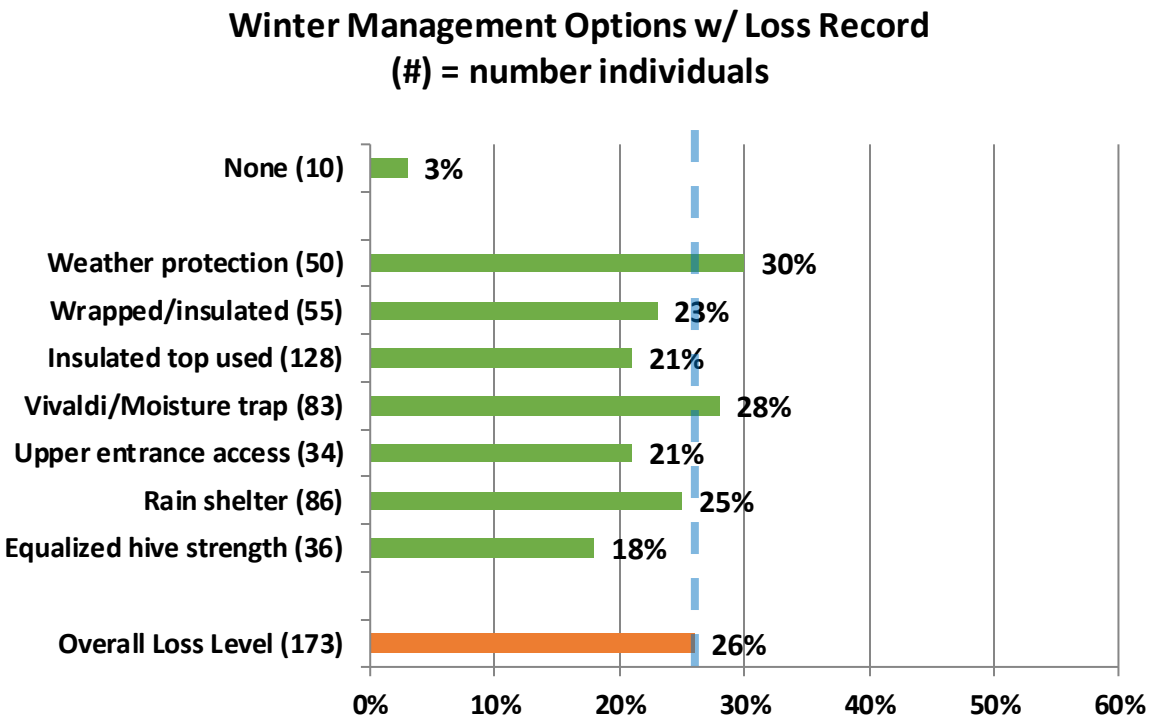
The most common wintering management selected was insulated top (128 individuals, 78.5% of respondents, an increase of 17.5 percentage points from the previous year, which was 9 percentage points greater than the year before – it seems individuals are listening to past results and speakers who are saying the "key" to better wintering is top insulation of at last 5 r value) – they had a 21% survival level , 4.5 percentage points better than the average. Equalizing colonies in the fall had the best loss level of 18% (36 individuals.) Venting the upper box (83 individuals, 27.5% loss) and sheltering colonies form wind/water (50 individuals, 30% loss) were the two managements that were less successful for improving overwintering success. Figure 8 shows per cent of individual choices and bar length shows percent winter loss of each selection. Bars to left of green dashed line means better survival than overall. Only equalizing (along with insulted top) improved winter survival.

Summary: Over the past seven years individuals that did no winterizing practice (average 10.6% of individuals – recall that 31% of total OR respondents did not responding to wintering management questions when they did FAST TRACK - averaged 41.7 loss compared to 35.2% overall average loss of last 7 years, a 6.5 percentage point poorer survival rate. This year the 10 individuals doing NO Winterizing lost only a single colony of 35 overwintered colonies - a 3% loss rate. I have no explanation why they did so well without any winterizing preparations.

Use of an insulated top winterizing management has improved survival 6 of 7 years (7-year average loss of 28,7%, a 6.5-percentage point improvement); this year it was most common winterizing management (128 individuals), and they had a 4.5 percentage point improvement in survival.

Vivaldi/quilt box and wind/weather protection showed the poorest survival this year as were noted in all past 7 years. Equalizing hive strength was the best management to improve survival over the past three years and this year this management had the best survival with an 18% loss level. Like feeding, winterizing efforts, while useful for some individuals, is not by itself a means to significantly improve wintering success.

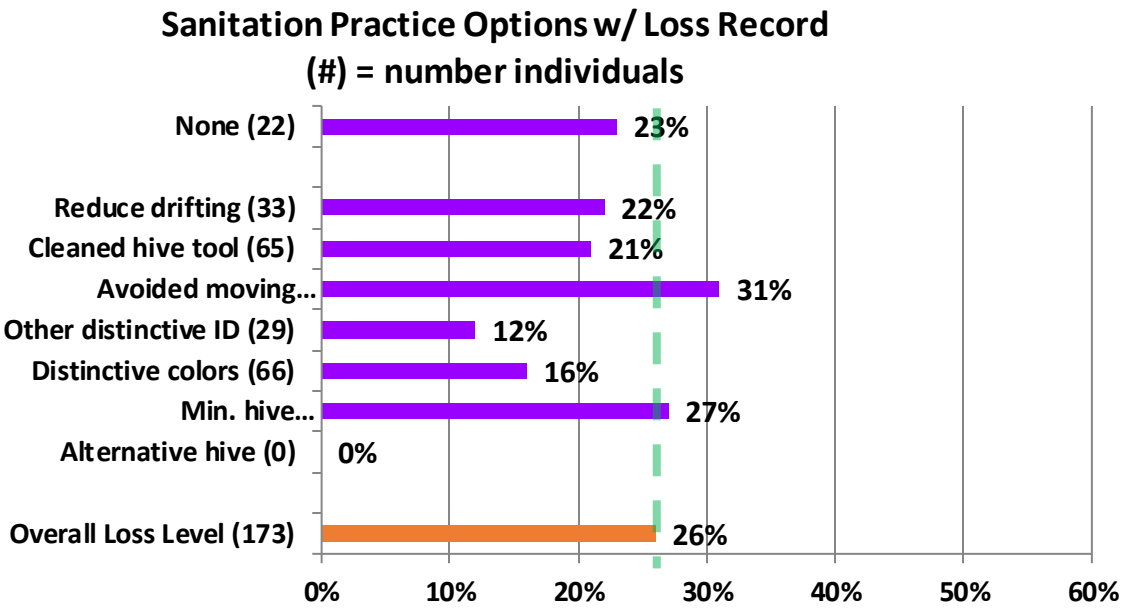
Figure 8



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 ensure healthy bees. We received 164 responses for this survey question 1.1/individual (1 percentage point lower than last year). Twenty-two individuals said they did not use any of the six offered alternatives; they had a loss rate of 22% compared to the overall rate - also 25.5%. Over the past five years those indicating doing nothing had a 37.9% percent loss rate, four percentage points higher than the average loss rate of 33.9% over the same time period. This year those doing nothing had a slightly better survival (by 3.5 percentage points). Sixty-three (42 %) individuals had 1 selection with 20% loss, 35 had 2 choices (the median number) with 18% loss level (the best overall), 41 selected 3 managements (33% loss level), 22 had 4 (19% loss level), and 3 made 5 or 6 selections with 30% loss level.

Minimal hive intervention (74 individuals) was the most common option selected, as it has been for the last 4 years. It could be argued that less intervention might mean reduced opportunity to compromise bee sanitation efforts of the bees themselves and that excessive inspections/ manipulations can potentially interfere with what the bees are doing to stay healthy. This option, however, has not improved winter survival; the loss rate for this group the past 7 years was 44%, 10.3 percentage points above the average 7-year 33.7% loss rate. This year the 74 individuals had a 27% loss rate.

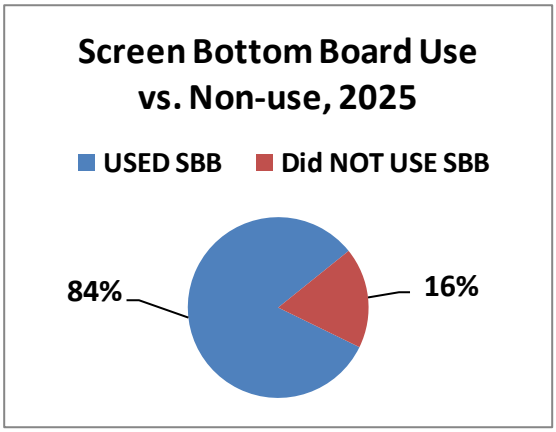
Figure 9



The best improvement this year was to paint hive bodies different colors (66 individuals with 16% loss rate) and doing other managements to avoid drifting (29 individuals, 12% loss rate). Avoiding moving frames and reducing drifting have been the two sanitation choices that have demonstrated better average survival the past seven years – 7-year loss rate was 32% for not moving frames which is 1.7 percentage points better survival (the past three years it has been 2 percentage points higher than average) and 28.6% for reducing drifting, a 5.1 percentage point improvement in survival. This year, avoiding moving frames (72 individuals), had slightly poorer survival with 31% loss rate while reducing drifting had a 4 percent-point improvement – 21.5% loss rate by 33 individuals. Overall, sanitation appears to be relatively minor toward improving survival.

SCREEN BOTTOM BOARDS (SBB)

Although many beekeepers use SBB to control varroa, BIP and PNW surveys clearly point out they are not a highly effective varroa mite control tool. In this recent survey, statewide 29 individuals (17%) said they did not use screen bottom boards - 25% said they used sometime. Average non-use for the last eight years is 16%, vs 84% use, on some or all colonies. Figure 10 right.



This past overwintering season, the 29 non-SBB users had winter losses of 43 colonies, a 27.5% loss. Examining the eight-year average of SBB use, loss

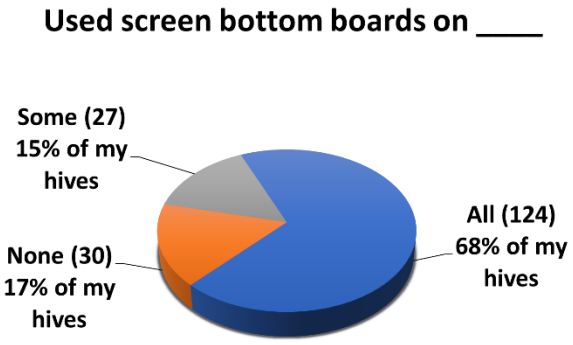
level of the 84% using SBB on all or some of their colonies was 32.2% loss level whereas the 16% not using SBB had loss rate of 35.2%, a 3-percentage point positive survival gain for those using SBB versus those not using them. This year Those using screen bottom boards had a 21.5% winter loss versus those not using them having a 27.5 % loss, a survival advantage of 6 percentage points, minor improvement for overwinter survival.

We asked if the SBB was left open (always response) or blocked during winter. This past season, 71%, 115 individuals, said they always blocked SBB during winter; 16 individuals statewide said they blocked some of the SBBs. Statewide those who blocked always or sometimes had 818 colonies in the fall and lost 176, a 21.5% loss rate. Those 30 who never blocked had a 27.5% winter loss, a 6-point percentage difference. As in past years, there was a slight advantage **in favor of closing the SBB over the winter period to improve survival.**

Summary: Screen bottom board use has a slight survival advantage. For those using SBB, the advantage appears to be to close, partially or completely, the screen over the winter period.

Mite monitoring/Sampling and Control Management

We asked the percentage of Oregon hives monitored for mites during the year 2024 and/or overwinter 2024-25, whether sampling was pre-/post-treatment or both and, of the five possible mite sampling methods, what method was used and when it was employed. Seventy-two respondents did response to this and did not FAST TRACK around the question. 124 individual respondents (68.5%), said they monitored all their hives. The losses of those individuals monitoring were 23 %. Thirty individuals (16.5%) reported no monitoring; they had essentially the same rate of 22% loss. 27 individuals reported monitoring some of their colonies; they had a 25% loss.

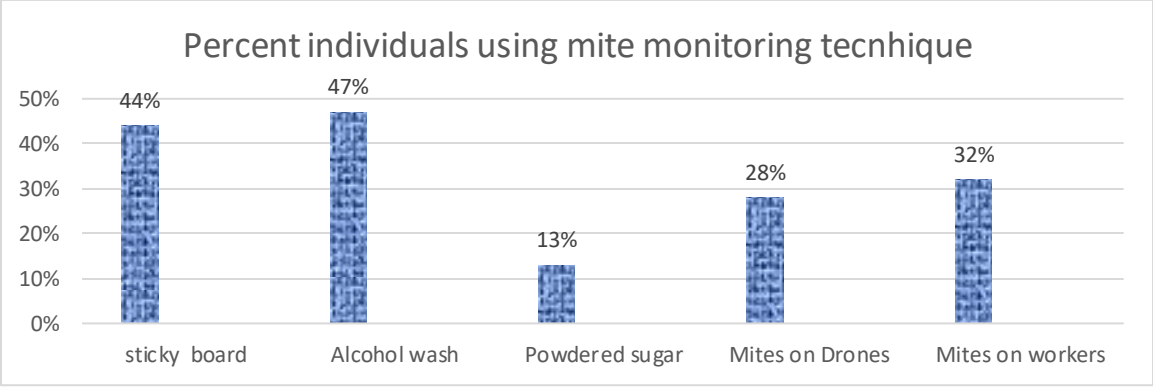


Monitoring alone is a means towards improved winter survival. The table below compares % individuals and % winter loss for individuals who monitored all colonies compared with those who monitored none. The nine-year difference is eight percentage point better survival monitoring all colonies. The loss rate of 16-26% who monitored some colonies was variable, averaging one percentage point higher than those monitoring all colonies.

	ALL Colonies Monitored % individuals	% Loss	SOME Colonies Monitored % individuals	% loss	No colonies Monitored % individuals	% loss
2025	ALL		Some		None	
	69%	23%	15%	25%	17%	22%
2024	64%	21%	17%	28%	17%	15%
2023	68%	29%	16%	27%	16%	36%
2022	66%	37%	15%	27%	18%	42%
2021	73%	34 %	11%	36%	17%	36%
2020	67%	33%	13%	16%	20%	49%
2019	67%	51%	15%	50%	18%	59%
2018	63%	38%	14%	26%	26%	49%
2017	63%	43%	15%	60%	22%	48%
8-year loss avg		32%		33%		40%

Individuals indicated use of 1.6 monitoring techniques on average. In total choices, in order of popularity of use, 85 individuals used alcohol wash (their loss level was 19%), 80 individuals used Sticky boards (22.5% loss level, 57 looked on adult bees for mites (loss level 32%), 51 looked on drone rood for mites (20% loss level) and 24 individuals used a sticky (debris) board to look for mites – they had 31% loss level. In the past 5 years, the use of sticky boards has decreased in use and alcohol wash has increased in use. This was the third year Alcohol use monitoring was the major monitoring technique and also with the lowest loss level. Figure 11 below Illustrates percent using the five monitoring methods.

Figure 11



Whatever technique used, most sampling to monitor mites was done in July – September, as might be expected since mite numbers change most quickly during these months and sampling results can be used to key control decisions. Figure 12 illustrates monthly sampling with five methods.

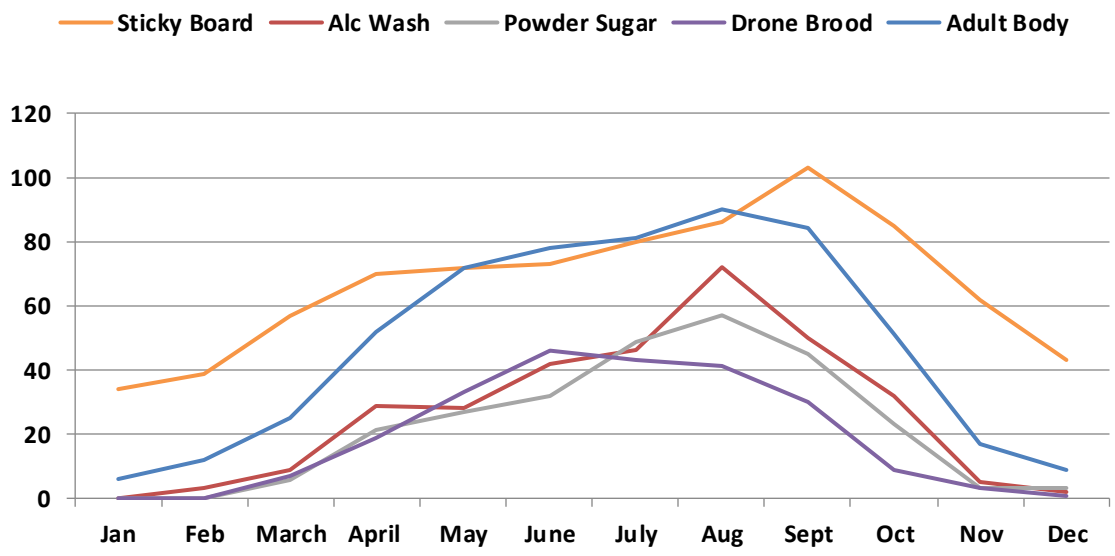
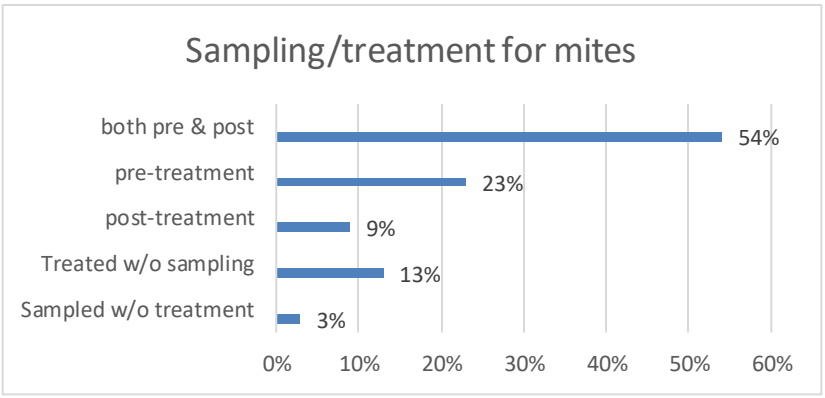


Figure 12

The most common sampling of respondents is both pre- and post-treatment (54% average). The sampling pre-treatment percentage has been decreasing while post treatment sampling has slowly been increasing. It is important to know if the treatment works so post treatment should not be avoided. Treatment without sampling was 13%, (same as last year). Figure 13.

Figure 13

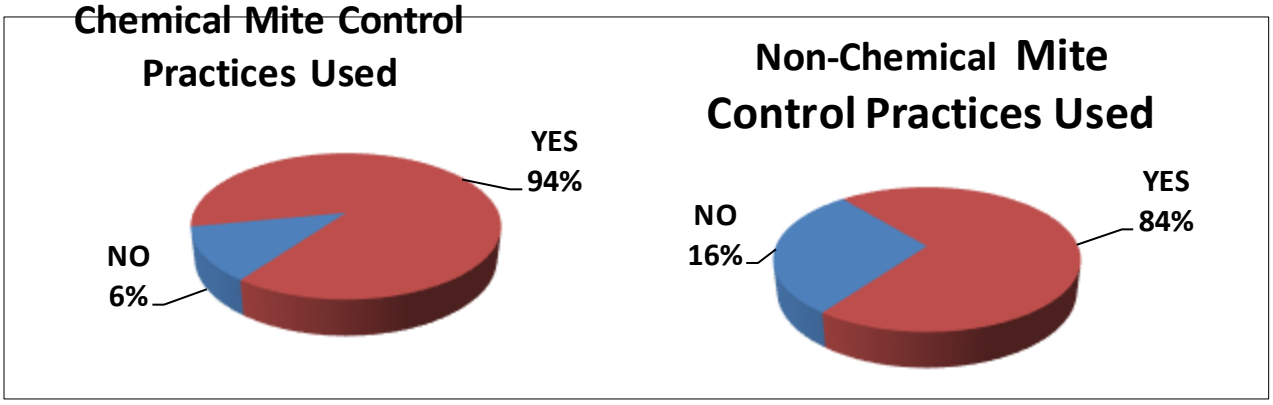


It is important to KNOW mite numbers. Less effective mite monitoring methods include sticky (detritus) boards below the colony and powdered sugar. Often so much detritus drops onto a sticky board that counting the mites can be hard, especially for new beekeepers. Sticky boards used for a single day pre- and post-treatment can help confirm the effectiveness of a treatment, if numbers drop post treatment. Visual sampling is not accurate: most mites are not on the adult bees, but in the brood, especially when there is a lot of brood. Additionally, adult mites are NOT on the adult body where they can be observed (over 90% are on the lower abdomen, tucked within the overlapping bee sternites). Sampling for mites in drone brood needs to be refined as a predictive number; they can be used as an early warning ls cells had mites.

See ***Tools for Varroa Monitoring Guide*** www.honeybeehealthcoalition.org/varroa on the Honey Bee Health Coalition website. The Tools guide 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 2-3% during the fall months when bees are rearing the fat fall bees that will overwinter. It is also the most challenging time to select a control method (if one is deemed needed) as potential treatment harm may negatively impact the colony. We see more colonies suddenly disappear (abscond?) during the fall, which may be related to the treatment itself.

Mite Control Treatments

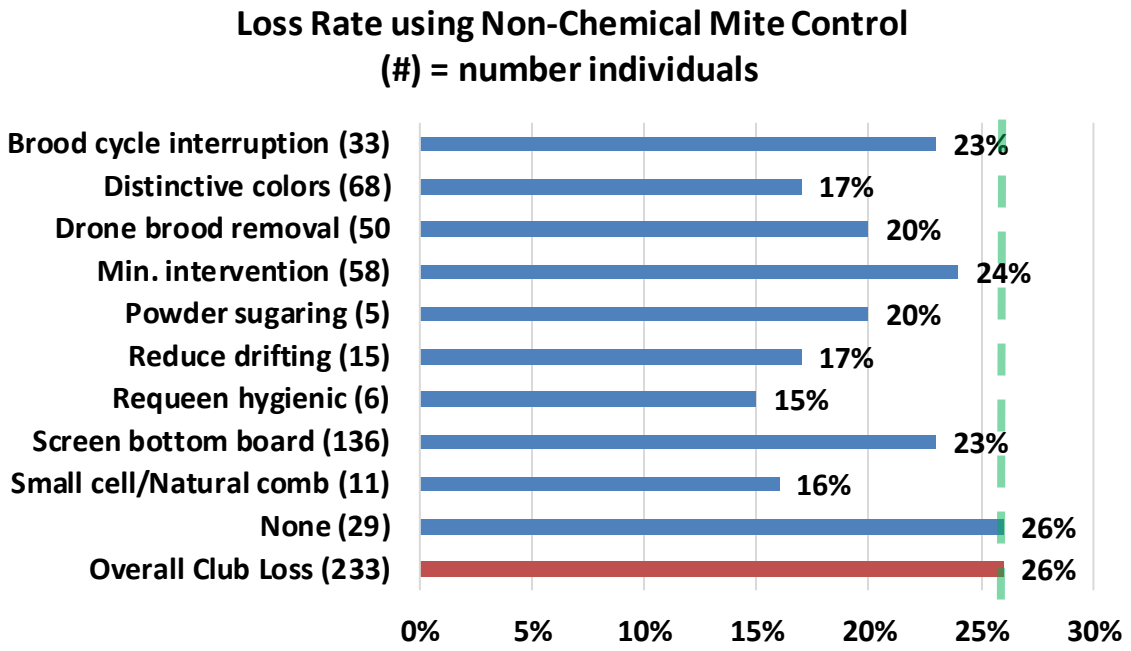
The survey asked about non-chemical mite treatments and also about the use of chemicals for mite control. Twenty-nine individuals (15.5%) said they did not employ a non-chemical mite control and 6. Those 29 individuals who did not use a non-chemical treatment reported a 26% winter loss, a half percentage point higher than overall, while those 6 who did not use a chemical control lost 23% of their colonies, two and half percentage points lower than the overall average. The individual options chosen for non-chemical control and chemical are discussed below.



Non-Chemical Mite Control: Of nine non-chemical alternatives offered on the survey (+ other category,) 38 individuals (20.5%) used one method, 54 used two, 42 used three, 17 used 4, 7 used 5 and 4 individuals used 6 or 8. Individuals using a single method had 36% loss rate, those using two had a 22% loss rate, those with three similarly had a 22% loss, the 17 using 4 had loss level of 14%, the 7 using 5 had 9% loss and the 4 using the greatest number of options had a 30.5% loss. The individuals doing none (29 individuals) had 26% loss. Clearly using more than one method/tool (within a limit) improves success.

136 individuals (73% of total respondents – 6 percentage points higher than last year) listed use of screened bottom board. The next most common selection was distinctive colors (63 individuals= 34% of respondents). The use of the remaining selections is shown in Figure 15; number of individuals in ( ), the bar length represents the average loss level of those individuals using each method. Those left of **green dashed** line had improved survival.

Figure 15



Two of the non-chemical alternatives have demonstrated reduced losses over the past 7 years. Reducing drifting such as spreading colonies (28 % loss average for 6 years – question not asked in 2016-17 survey) and brood cycle break (31.3.% average) have consistently year after year demonstrated somewhat better survival than average loss (33 % average loss last 6 years and 35.4 % loss last 7 years respectively). Different colony colors in apiary)17%) and drone brood removal (20% loss) were helpful this year and barely better in 6-year loss average. Small cell/Natural comb and requeen, managements of only a few individuals showed better survival this year.

Chemical control: For mite chemical control, 6 individuals (3% of total respondents) used NO chemical treatment. They had a loss level of 23%. 30% (74 individuals) who used FAST TRACK and did not supply information had a loss level of 35.5%. Those using chemicals used at a rate of 0.94/individual down from 2.3/individual last year and the previous year when it was 3.3/individual. Eighty-four individuals using a chemical 48%) used one chemical. Overall, these individuals had a 29% loss level. Individuals who used 2 chemicals (70 individuals -40% of respondents had 17.5% loss. The three individuals that used 4 chemicals did even better – no loss of 13 total colonies. The individuals using 3 chemicals (18 individuals) had a 31% loss. The biggest use was oxalic acid – 145 individuals (83 of chemical users) – they had loss level of 21%. Figure 16 shows usage and loss levels.

Apivar: The number of times a chemical was used was captured in the survey. For example, there were 42 individuals who used Apivar, the synthetic miticide with amitraz. One used it once – 1 of 4 colonies did not survive=25% loss, 11 individuals used it twice and had 20% loss and the 30 individuals who used Apivar a single time had a 26% loss level. Overall, for the 42 Apivar users 24% loss. That is what is graphed in Figure 16.

Essential Oils: Apiguard, the essential oil gel, had a very decent survival level. It was used four times by one individual - 1 of 3 colonies survived for a 67% loss, the single individual who used it three times had all 4 colonies survive 0% loss, 17 individuals who used Apiguard twice had 14% loss and the 32 individuals using it once had 18% survival. Overall Apiguard users (51 individuals) had a 17% loss rate. There were 16 individuals who used APiLifeVar, also an essential oil miticide. The single individual who used it once lost all 3 colonies, 100% loss, whereas the one individual using it 3 times had all 3 colonies survive =0% loss. Two individuals using it twice had 0 loss (6 colonies total) and the 12individuals using APiLifeVar one time lost 16 of 66 fall colonies = 24% loss. Overall loss=24% for this miticide.

Formic Acid: Formic acid is a powerful acid capable of causing collateral damage to the bee brood and is sometimes a queen killer. Three individuals used it one and lost 3 of 5 colonies – 6% loss, ten individuals used it twice and lost 12 of 37 colonies – 32.5% loss and those using it once (11 individuals) lost half of their colonies – 50% loss. Overall, the 22 formic acid users did not do very well with mite control - they had a 43% loss.

Hopguard: this is another acid miticide. It too did not promote good survival. Two individuals using it 3 times didn't lose any colonies (5 total); the 3 individuals using it twice lost 55.5% and the 6 individuals using it once lost 38.5%. Overall loss level was 38%.

Oxalic acid: the vast majority of individual treating for mites chemically used oxalic acid in one of three ways, as drizzle (OAD), and vaporization (sublimation) OAV and oxalic acid in absorbent pads meant to keep oxalic acid in the hive for an extended period OAE. There is a new approved product VarroxSan on the market, but it was not available for use until after this year, so users followed a recipe and made their own absorbent pads. Overall 145 users of oxalic acid had a 21% loss.

QAD: One individual drizzle 6+ tomes and lost 1 of 3 colonies 33% loss, 1 individual used it three times and lost both colonies overwinter - 100% loss, the three individuals who used it twice also had a 33% loss level while those using it once lost only 5 of 53 colonies for a 9.5% loss level – Overall 16 users had a 16.5% loss level.

OAE: This is a relatively "easy" way to use oxalic acid. Forty-six individuals used it to control mites and had only a 14% loss. Four individuals used it 6+ times and had a 14% loss, the 4 individuals using it 4 times did even better – they had a 6% loss. Five individuals used it 3 times with a 23% loss (3 of 13 colonies did not survive), six individuals used it twice with an 18% loss and those 27 individuals using OAV once had a 14% loss.

OAV: A total of 136 individuals used oxalic acid vaporization to control mites. They did this on 927 colonies, 71 survived for a 20% loss level. Twenty individuals used OAV 6+ times and had a 15.5% loss, sixteen individuals used it 5 times with a 30% loss and 19 individuals used it four times with a 31% loss. It is unclear why only 4 or 5 uses would not perform better. The 26 individuals using it 3 times had a 21.5% loss, the 25 individuals using it twice had a 13.5% loss and those 30 individuals using it a single time had a 24% loss.

Other chemicals used included mineral oil - the single user lost 2 of 8 colonies = 25% loss and use of oregano oil again a single user but in this instance all 3 colonies survived (0% loss) and finally the 3 powdered sugar users lost 1 of 8 colonies = 12.5% loss

Consistently, over the last 8 years, four different chemicals have helped beekeepers improve survival. These were essential oils Apiguard (average 8-year loss level 27.6%), Apivar (29.9% average 8-year loss level), ApiLifeVar (29% average loss level over last eight years) and Oxalic acid vaporization (also 29% average loss level over last 8 years). The average loss level has been 35.7% in the last 8 years. Formic acid too has done better than average in the last 7 years but the product has changed from MAGS to Formic Pro so I cannot be sure what Formic acid product was used by the 107 respondents who reported using it. Oxalic acid drizzle did well this year (16% loss level) - average for the last 8 years is 33.7%. The extended OAE (absorbing oxalic acid and glycerin into sponges) did very well in promoting better than average survival in the past two years and its use has increased dramatically. It was the best product for OR beekeepers this year – 46 users had a 14% loss, 11.5 improvement over average loss.

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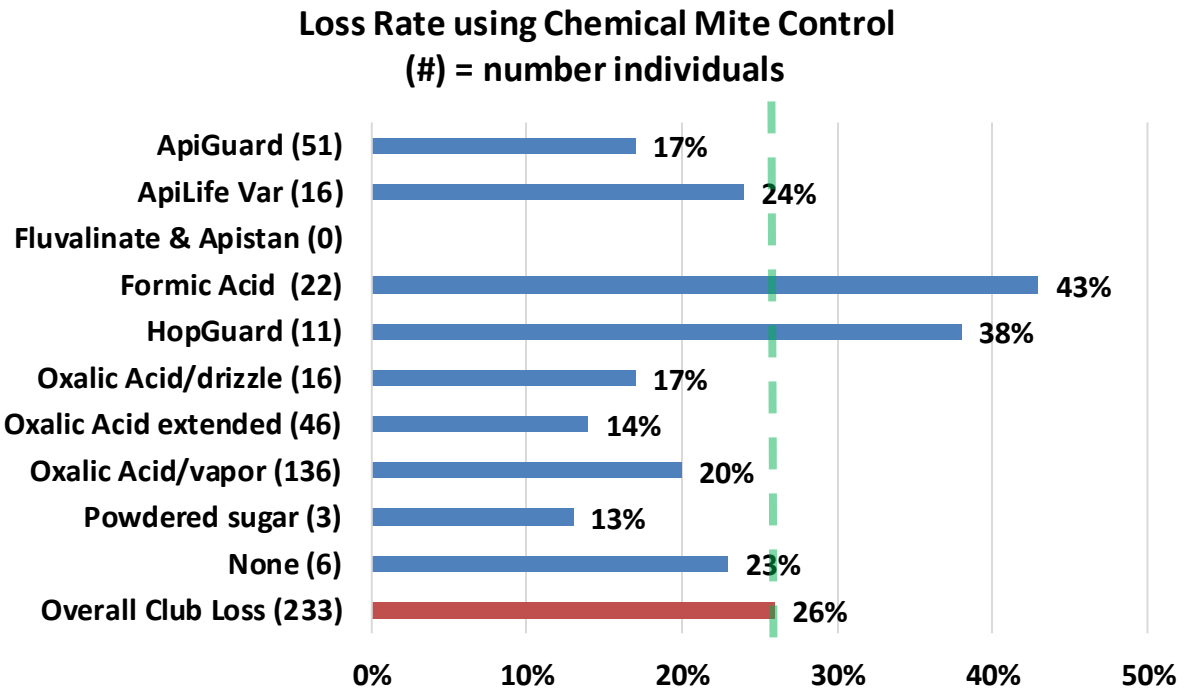

Figure 16

Antibiotic use

Five individuals (2.5%) used Fumagillin (for Nosema control) and had a 39% loss rate. One individual indicated use of Terramycin, they had 43% winter loss. Last year no Terramycin users were recorded.

Queens

We hear lots of issues related to queen "problems". Queen events can be a significant factor contributing to a colony not performing as expected. Thirty-three percent elected to FAST Track and did not respond to this final set of questions. Eighty of the 168 respondents (47.5%) who responded to this question said they had marked queens. This is 7 ½ percentage points greater than last year. The related question then was 'were your hives requeened in any form?", to which 80 (115 individuals) said yes (16 percentage points higher than last year). When asked how colonies were requeened (multiple answers were possible) 54 said their colonies swarmed and 27 of their colonies superseded. Fifty colonies were split (and they raised an emergency queen presumably). A total of 64 said they introduced a mated queen, 9 introduced a virgin queen and 31 said they introduced a queen cell.

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. A new national survey administered by Apiary Inspectors of America, Auburn University and by Natalie Steinhauer, a research associate at Oregon State University has continued a national survey but response has not been as large. The BeeInformed survey measured larger scale OR beekeepers, not backyarders. Loss rates are of total colony number and more representative of commercial scale beekeeping. 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 2025