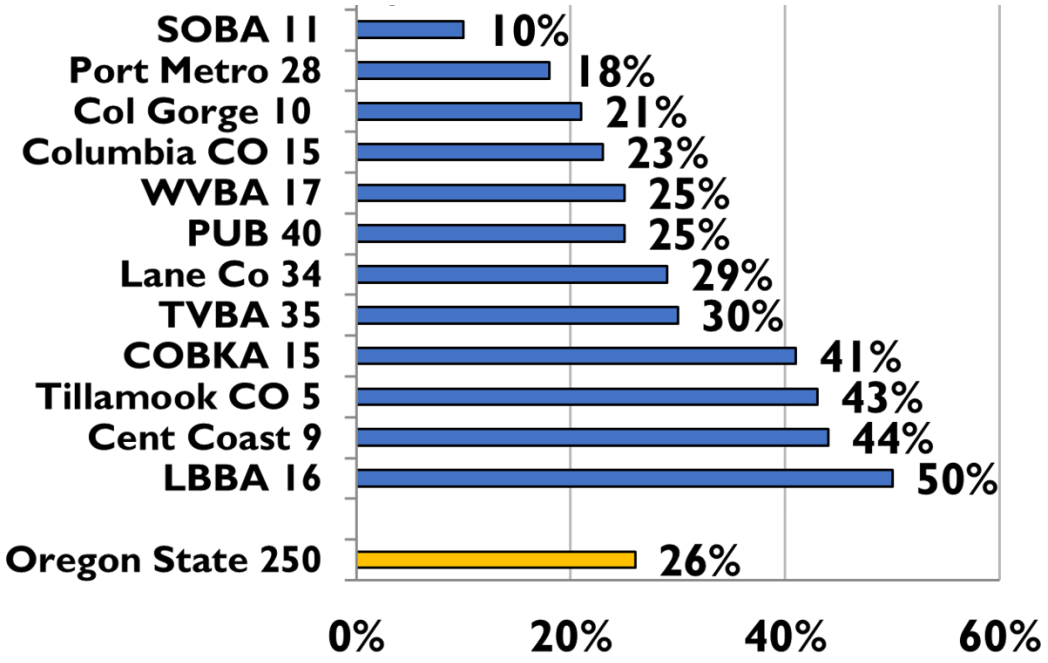
2024-25 Portland Metro Winter Loss by Dewey M. Caron

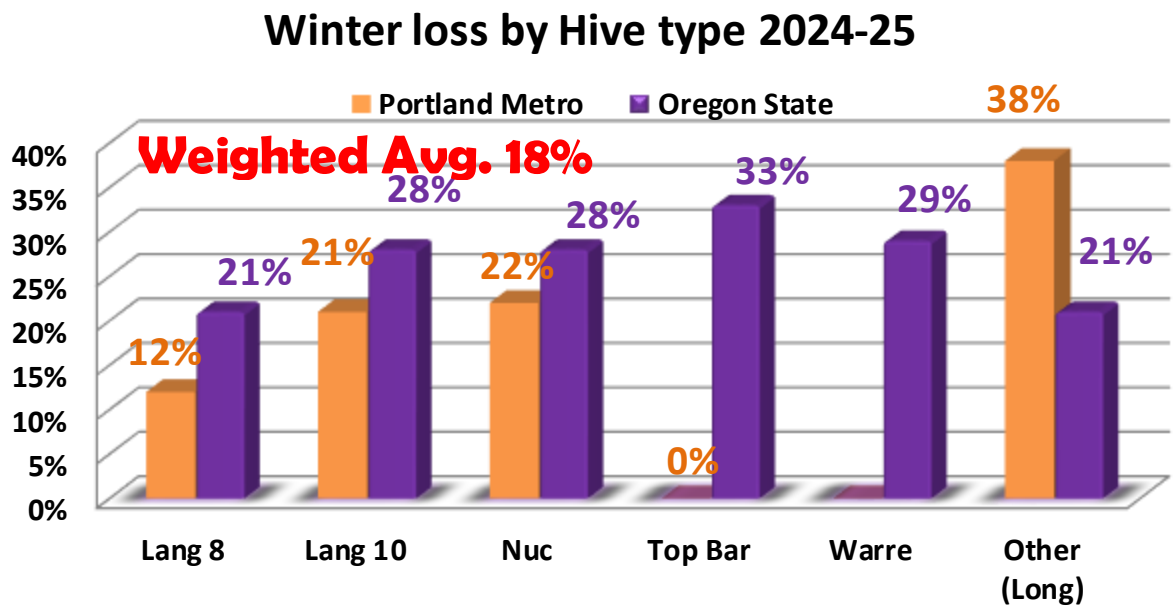
The pnwhoneybeesurvey.com is a continuing effort to define overwintering success of OR and WA beekeepers. This was the 16th year of such survey activity. I received 250 Oregon beekeeper responses; they had a 25.5% loss level, slightly increased from last year when the lowest level in all the survey years was recorded. Respondent number was below the 5-year average of 305/year. Portland Metro response was 28 and while that is 11 more than last year is below the average of previous 5 years of 52/year. Graph shows the loss levels with participation of PM and another dozen bee clubs this past year.



The 28 Portland Metro (PM) members reported on 216 fall colonies (range 1 to 49 colonies, average 7.7 colonies, median 5 colonies). **Portland Metro loss level was 18%**, 7.5 percentage points below the state loss level. Percent losses, determined for 5 hive types, is shown in Figure 1 below comparing PM with the statewide backyarders. PM member respondents reported 58 fall Langstroth 8-frame and 54 10-frames hives. Losses of the 8-frame Langs was 33% compared to 19% for the Lang 10s. Five of seven fall nucs did not survive while a single Top Bar hive did survive, and 5 other long hives did as well. There were no Warré hive types reported.

The survey also asked for hive loss by hive origination. Fourteen (50%) used FAST TRACK and did not supply numbers. Of those 14 who did respond overwintered PM colony loss was 5%, nuc loss was 16%, 9% of swarm originated colonies were lost and 12% of splits did not survive.

Figure 2



Fall	97	101	9	1	0	8
Spring	85	80	7	1		5

Losses for PM beekeepers have been decreasing. Figure 3, Red dotted line is trend.

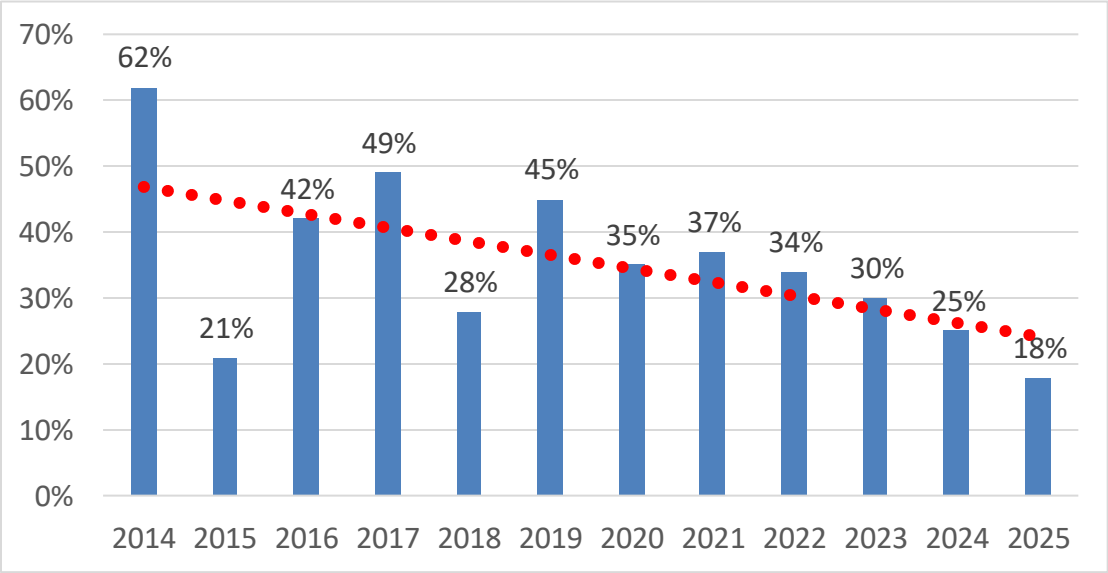


Figure 3

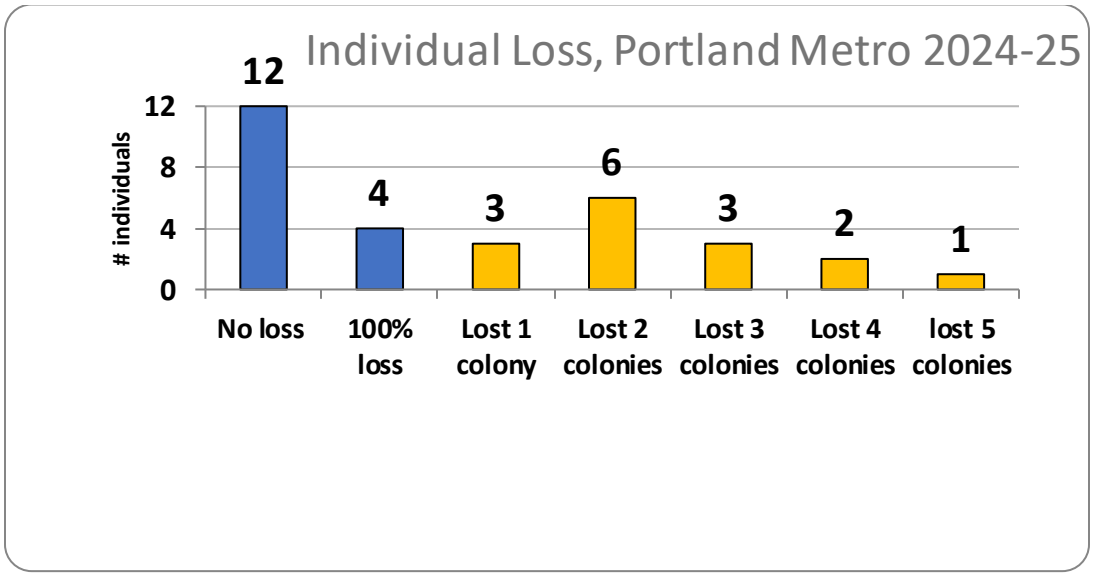
Who are the survey respondents?

The PM respondents to the electronic survey managed one to 49 fall colonies. One individual had 1 colony, which survived, seven respondents had 2 colonies (43% loss), and four individuals had 3 colonies (50% loss). Individuals with 1-3 colonies (43% of total respondents) collectively had a 44% loss. Three individuals had 4 colonies (33% loss) and the four individuals with 5 colonies only lost a single colony; individuals with 4&5 colonies lost collectively 15.5% of fall colonies. Two individuals had 7-9 colonies, and they lost 25% (4 of 16 colonies). The 7 individuals with 10+ colonies (142 colonies total) lost 17 colonies for a 12% loss. Statewide as individuals managed greater number of colonies the percentage of loss decreased.

Nine individuals (32% of respondents) had 1, 2 or 3 years of experience (loss level 60%) seven individuals had 4 or 5 years' experience (2.5% loss level), four individuals had 7-9 years' experience 24.5 loss) and the eight individuals with 10+ years' experience (45 the highest number of years) ha d a 13.5% loss. Clearly beekeepers with fewer colonies lose more colonies percentagewise and PM individuals with more experience had lower losses as did the statewide respondents.

Twenty-five of 28 (89%) PM beekeepers had an experienced beekeeper mentor available as they were learning beekeeping. This percentage was one single percentage point above the previous year.

Not everyone had loss. Twelve PM individuals (43%) reported total winter survival (73 colonies); unfortunately, four individuals (14%) lost 100% of their colonies (9 colonies total). Greatest loss was two colonies, and 6 colonies was the heaviest loss. Individual loss data is shown below in Figure 4.



Three individuals moved hives during the season, one for pollination, one to sell colonies and the 3rd to a better location for blackberries. Four had bees in 2 apiaries.

Reasons for Colony Loss/Acceptable loss

We asked the 14 individuals that had colony loss to estimate what the reason might have been for their loss (multiple responses were permitted). There were 26 total listings for PM, 1.85/individual.

- 6 responses were didn't know
- 1 each indicated poor wintering and Nosema
- 2 each said varroa and weak in the fall
- 4 said starvation
- 6 said loss due to queen issues

Survey individuals are asked to indicate what might be an acceptable loss level. Three individuals said none, one said 5%, 5 said 10%, 1 said 15%, 9 indicated 20% (the median and most common selection and the indication closest to the actual loss of 18%, 3 said 25%, 1 said 33%, 1 indicated 50%, and 2 each 75 and 100% was an acceptable loss.

Why do Colonies Die?

There is no easy way to verify reason(s) for colony loss. Colonies in the same apiary may die for varied 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. There is 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. PM individual choices varied from zero to 100%, with medium of 20%.

Major factors in colony loss are thought to be mites and their enhancement of viruses especially DWV (deformed wing virus) and declining nutritional adequacy/forage and diseases. Pesticides in the agricultural environment weakens colonies. 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 it, 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 which are declining. Can we duplicate the low losses this season in the next season? It is not possible to

demonstrate that losses are necessarily excessive for all the issues facing honey bees in the current environment. Varroa mites and the viruses they transmit are considered a major factor, but by no means the only reason colonies are not as healthy as they should be. We are learning how better to manage varroa mites and we have new tools virtually every year to bring to the challenge.

Management Selections and Losses

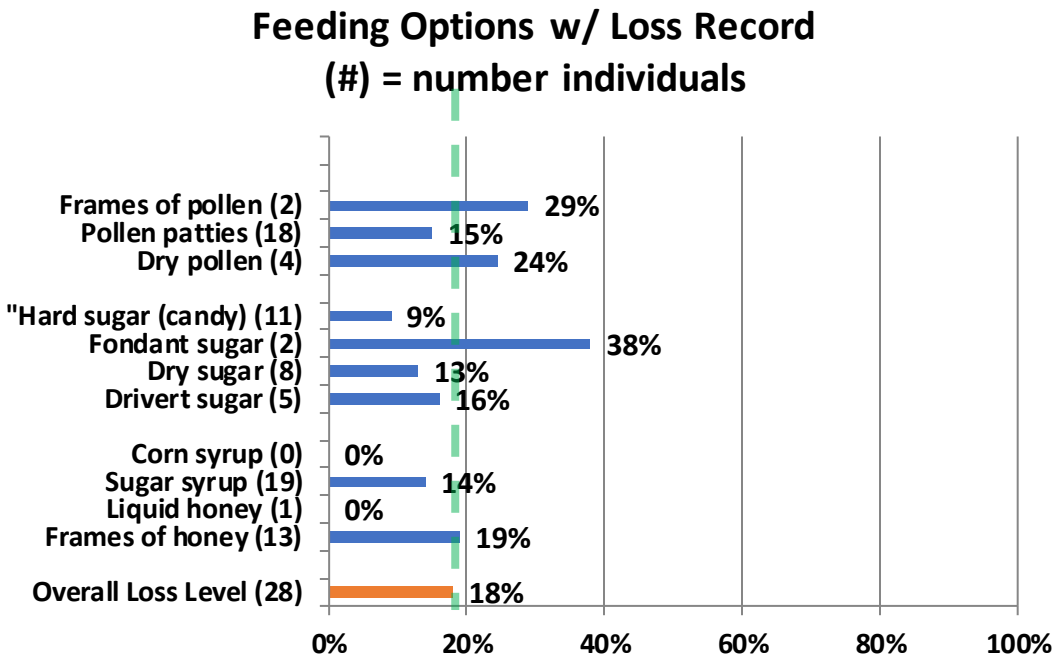
The survey inquired about feeding practices, wintering preparations, sanitation measures utilized, screen bottom board usage, queens, mite monitoring and both non-chemical mite control techniques (such as screen bottom board use, drone brood removal efforts, etc.) and chemical mite controls utilized. Individuals could check none or more than one response; many PM beekeepers often do not do just one thing/management to their colony (ies) to control mites toward improving overwintering success. This analysis however is of a single factor equated with loss level. Such analysis is correlative and doing a similar management as fellow beekeepers do does not necessarily mean you too will improve success.

The percentage of individuals that opted to FAST TRACK are indicated for each section. For example, 7 individuals or25% Fast TRACKED this first section on Feeding, Winterizing and Sanitation. Twenty-one supplied information.

FEEDING: Oregon survey respondents checked 507 feeding options = 3.4/individual while the 21 PM individuals checked 84, 4/individual. 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. For individuals indicating one or more feeding managements, feeding sugar syrup was the most common feeding option of respondents (20 of 21 individuals, 95% of respondents who indicated feeding management). Their loss rate was 14%, 4 percentage points better than the overall PM loss average.

Individuals feeding protein 18 individuals those feeding protein patties also fed frames of pollen and dry pollen), 86% of respondents had an overall survival rate of 15%, 3 percentage improvement from overall. There were 16 instances of feeding non-liquid sugar feeders led by 11 candy board feeders with only a 9% colony loss level: overall loss level of 13%, 5 percentage points better than overall PM level.

Figure 5



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.

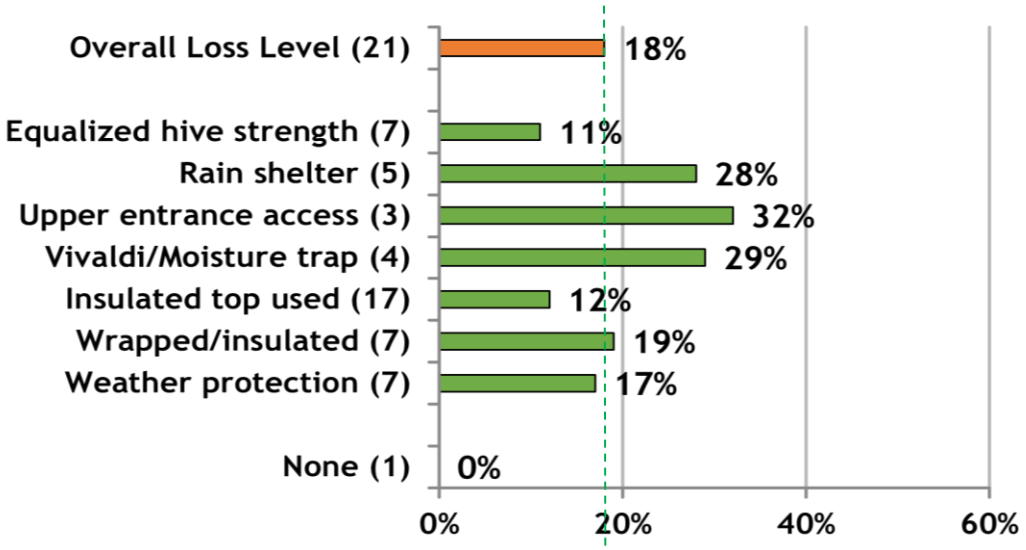
For individuals feeding protein, the protein patty users have had better survival 6 of 8 years (this year losses were four percentage points better than average); dry pollen feeders had better survival in three of the past eight years and this year had the second best survival level of all protein feeders 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 (2/individual down from 2.5/individual last year) about OR beekeeper wintering management practices (more than one option could be chosen). For PM individuals there were 58 selections (4/individual) including one who selected none. They had one colony, and it survived. Doing more did not ensure overwintering success statewide.

The most common wintering management selected was insulated top (128 individuals, 78.5% of respondents statewide and 17 of 20 PM individuals (80%) – it seems individuals are listening to past results and speakers who are saying the "key" to better wintering is top insulation of at last r5 value – they had a 21% survival level statewide, 4.5 percentage points better than the average statewide and 12% loss, an improvement of 6 percentage points for PM respondents.

Figure 6



Equalizing colonies in the fall had the best loss level of 18% (36 individuals) for both statewide and PM respondents (11% loss, 7 individuals). Figure 6 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 average 10.6% of individuals 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. The 1 PM individual who selected none had no loss.

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. 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, are not by themself a means to significantly improving wintering success.

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). Among the 21 PM respondents, there were 40 responses (both cleaning hive tool and providing distinctive colors had 12 each) and 3 said none. The 3individuals that indicated none lost one colony form 9 total = 11% loss. Statewide 22 individuals said they did not use any of the six offered alternatives; they had a loss rate of 22% compared to the overall rate of 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.

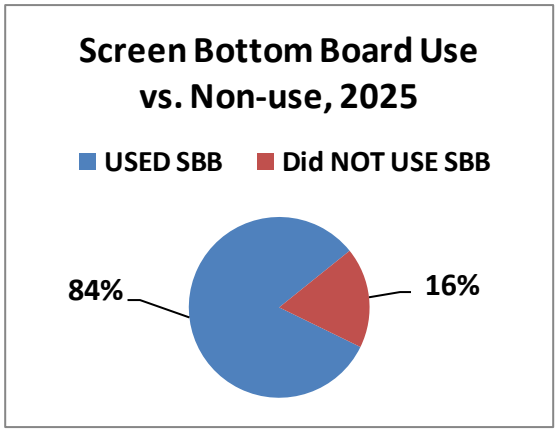
Minimal hive intervention (74 individuals) was the most common option selected statewide for the last 5 years. It could be argued that less intervention might mean reduced opportunity to compromise bee sanitation efforts of the bees themselves and that excessive inspections/ manipulations can potentially 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 4 PM individuals had a 30% loss rate.

The best improvement statewide last year and this was to paint hive bodies different colors (66 individuals with 16% loss rate statewide and 12 individuals with 14% loss rate in PM). Avoiding moving frames and reducing drifting have been the two sanitation choices that have marginally 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 and 28.6% for reducing drifting, a 5.1 percentage point improvement in survival. This year, Pm respondents, 4 for reducing drifting and 5 for avoiding moving frames did not have better survival compared to

the overall survival rate of 18. 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 7 right. For Pm, it was 13 who used on all colonies, 5 on some and 3 didn't use them (14) f or the 21 respondents (7 FAST TRACKED – i.e. did not answer).



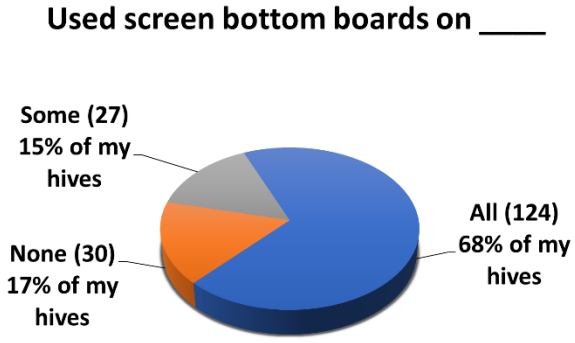
This past overwintering season, the 29 non-SBB users had winter losses of 43 colonies, a 27.5% loss. Examining the eight-year average of SBB use, loss level of the 84% using SBB on all or some of their colonies was 32.2% loss level whereas the 16% not using SBB had loss rate of 35.2%, a 3-percentage 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. For Pm the one individual that didn't block has all 3 colonies survive the winter.

We asked if the SBB was left open (always response) or blocked during winter. This past season, 71%, 115 individuals statewide 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. For PM 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 2024 year 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 not FAST TRACK around the question; for PM a higher percentage did provide answers 24 of 28 individuals. Statewide 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 loss rate of 22% loss. 27 individuals reported monitoring some of their colonies; they had a 25% loss. For PM, one individual did no monitoring – they had a single colony and it survived.



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.

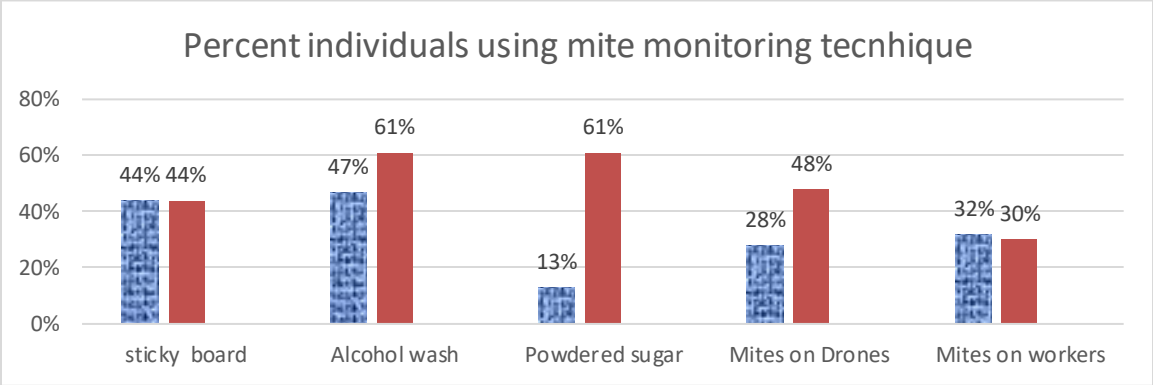
	ALL Colonies Monitored % individuals	**% Loss**	**SOME Colonies Monitored % individuals**	**% loss**	**No colonies Monitored % individuals**	**% loss**
2025	ALL		Some		None	
	69%	23%	15%	25%	17%	22%
2024	64%	21%	17%	28%	17%	15%
2023	68%	29%	16%	27%	16%	36%
2022	66%	37%	15%	27%	18%	42%
2021	73%	34 %	11%	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 statewide indicated use of 1.6 monitoring techniques on average. For Pm it was 2.1/individual (50 selections for 24 respondents). 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. For Portland Metro, 14 respondents each said they used Alcohol wash and powdered sugaring. Eleven said they looked at drone brood, 10 used sticky board and finally 7 said they looked at adults for mites.

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 9 below Illustrates percent using the five monitoring methods, statewide in blue and PM in red.

Figure 9



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.

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 10 (statewide data)

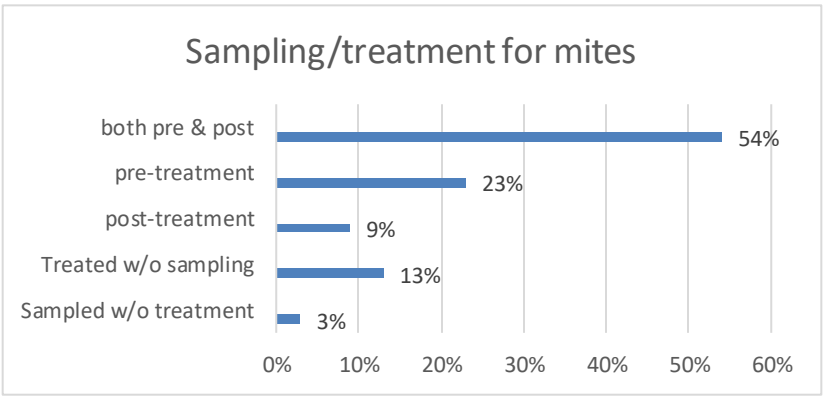


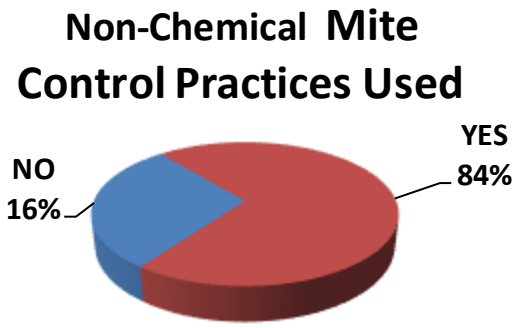
Figure 10

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. Those 29 individuals who did not use a non-chemical treatment reported.
a 26% winter loss, a half percentage point higher than overall. For Portland Metro the 4 individuals not selecting a non-chemical control had a 31% loss level. Individual not responding had a 50% loss level. Six individua-ls who did not use a chemical control lost 23% of their



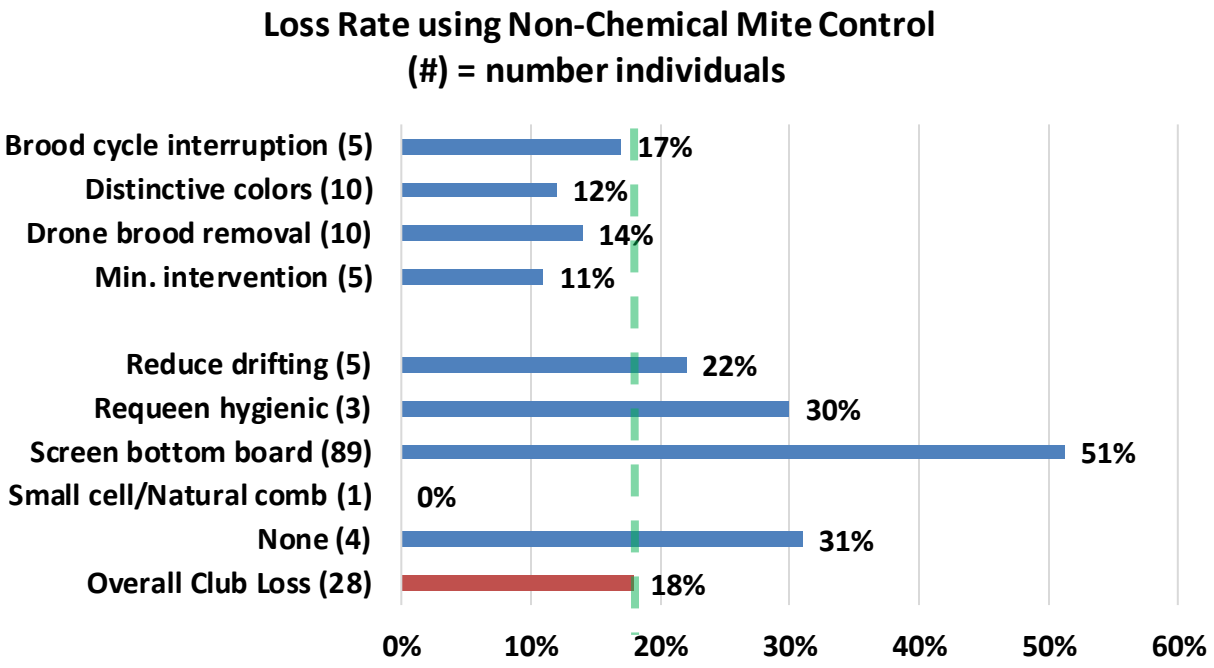
colonies, two and half percentage points lower than the overall average. The individual options chosen for non-chemical control and chemical are discussed below.

For Portland Metro the 4 individuals not selecting a non-chemical control had a 31% loss level. Individuals not responding had a 50% loss level. Statewide 6 individuals who did not use a chemical control lost 23% of their colonies, two and half percentage points lower than the overall average. All 24 respondents indicated use of a chemical (40 total selections, 1.8/individual). The 6 individuals who did not provide responses was 50% (9 of 18 colonies lost) The individual options chosen for non-chemical control and chemical are discussed below.

Non-Chemical Mite Control: Statewide 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. This was PM greatest choice as well 17 individuals (85%). The next most common selection was distinctive colors (63 individuals= 34% of respondents); 10 PM (50%) respondents also used this method and had 12% loss, the best survivorship of all options. The use of the remaining selections is shown in Figure 12; 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 12



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). For Portland Metro respondents different colony colors in apiary (12%) and drone brood removal (14% loss) were helpful this year as was minimum intervention. Small cell/Natural comb was a single individual who had total survival of 5 colonies.

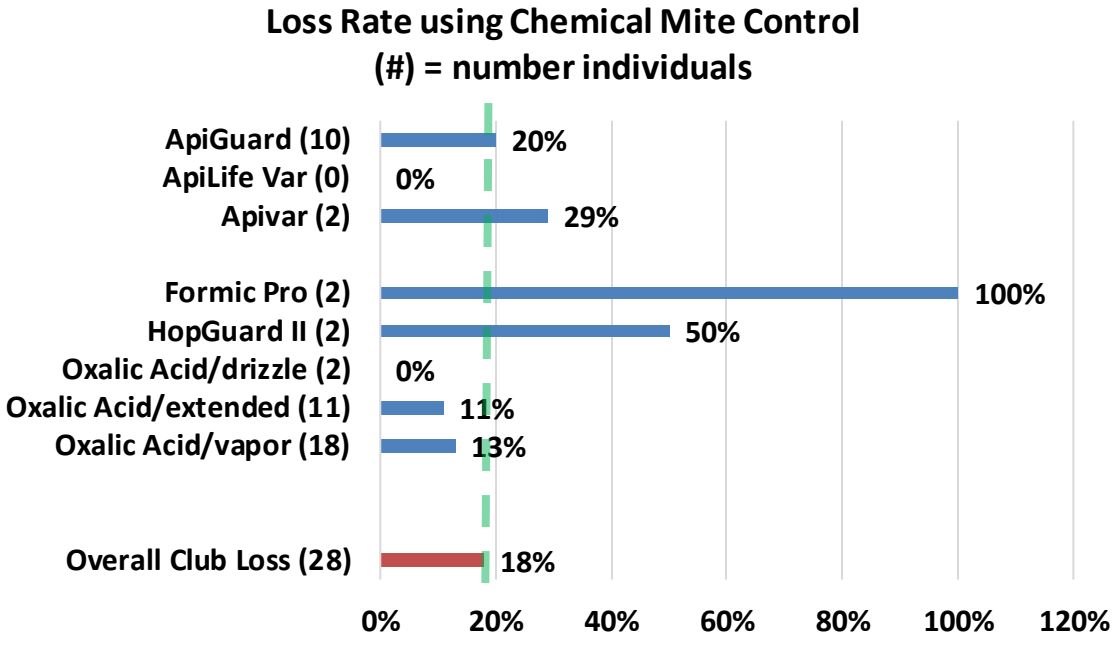
Chemical control: The 30% (74 individuals) statewide who used FAST TRACK and did not supply information had a loss level of 35.5%; for PM the 6 (21.5%) who did not provide answers lost 50%.

Chemical treatments were used once or more times. Here is that record for statewide and for Portland Metro

Apivar: The number of times a chemical was used was captured in the survey. For example, statewide 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 statewide.

For Portland Metro, 3 individuals used Apivar once and one used it two times. There loss was 10 of 66 colonies =15%. Overall loss was 41%. That is what is graphed in Figure 13.



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.

For Portland Metro, 4 individuals used it twice and 6 used it once. Single users had an 18% loss level and the 4 individuals using it twice had a 22.5%. Overall loss level was 19.5%.

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. No PM individuals indicated use of ApiLifeVar.

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.

For Portland Metro there were two users. One used it once and one used it twice. All 5 colonies died =100% 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%. One Portland Metro individual used Hopguard and lost 2 of 4 colonies (50% loss)

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 statewide. For PM overall loss of oxalic acid users was 12%.

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. Two PM individuals used drizzle and did not lose any of their 5 colonies.

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. For PM, one individual used OAE treatment four times and had 0 loss (5 colonies), 4 used it twice and had 13% loss and the 6 that used it once lost 3 of 46 fall colonies for 6.5% loss level. Overall, 10.5% loss level for PM users of OAE.

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 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. 18 individuals used Vaporization. Five individuals who used it once had a 18% loss, the 5 individuals using it twice had a 11% loss, 3 individuals used it 3 times and had 31.5% loss, the 2 individuals using it 4 times had 14% loss and those 3 respondents using it 6+ times had a 5% loss. Overall loss using OAV was 12%.

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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Antibiotic use

Two individuals (7%) used Fumagillin (for Nosema control) and loss 6 of 14 colonies for a 43% loss rate. One individual indicated use of Terramycin, they had 43% winter loss. Last year one individual used Terramycin – there was loss of 6 of 14 colonies for 43% loss.

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. Only 4 of 24 did not respond among PM members. Eighty of the 168 respondents statewide (47.5%) who responded to this question said they had marked queens. This is 7 ½ percentage points greater than last year. Fifteen of 24 PM respondents said they had marked queens. Pm members with marked queens had 14% loss, those without had 26% loss.

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). For PM 19 said yes, 1 said not that they were aware of and 4 said no. 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.

For PM 14 requeened with mated queen, 2 with virgin queen and 4 with queen cells. Member responded said equally colonies superceded and were split (7 members each) and 6 said their colonies swarmed.

Closing comments

This survey was originally designed to 'ground truth' the larger, national Bee Informed loss survey. 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