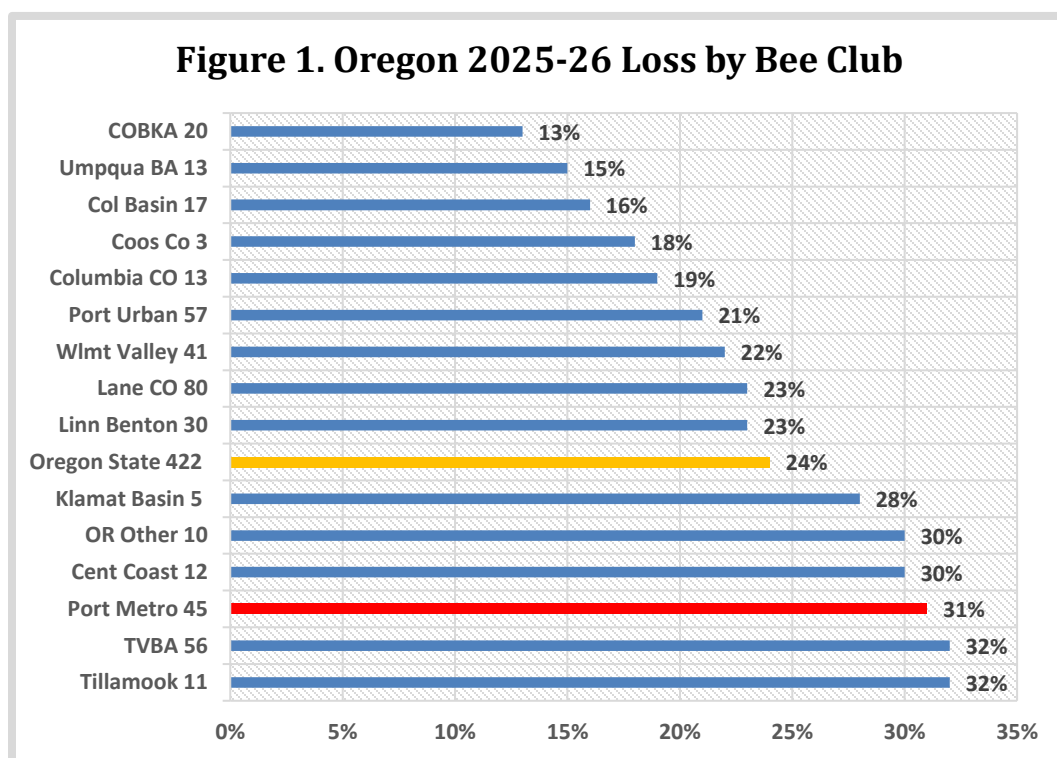


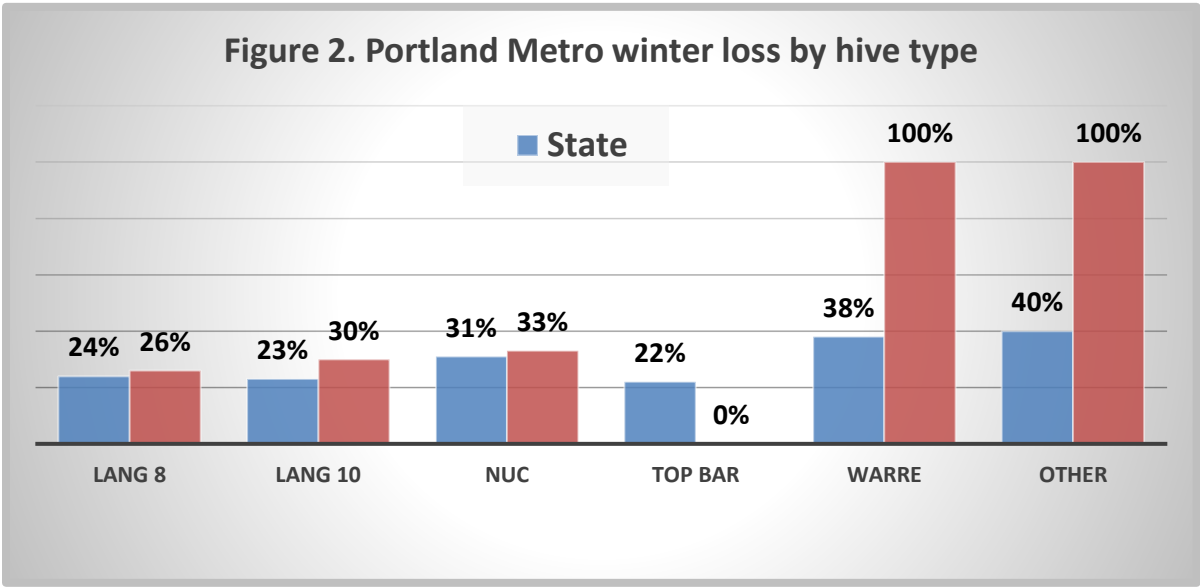
## Winter Bee Losses of Portland Metro Backyard Beekeepers for 2025-2026

The pnwhoneybeesurvey.com is a continuing effort to define overwintering success of OR and WA beekeepers. This was the 17<sup>th</sup> year of such survey activity. I received 442 Oregon beekeeper responses; they had a 24% loss level. Respondent number was an increase of 170 from the previous year and 147 above the 10-year average response rate of 275 (range 171-416). Portland Metro response was 45 (one did not have colonies) which is four less than the average of previous 6 years of 48/year. Figure 1 below shows the loss level with participation of PM and another dozen bee clubs this past year.



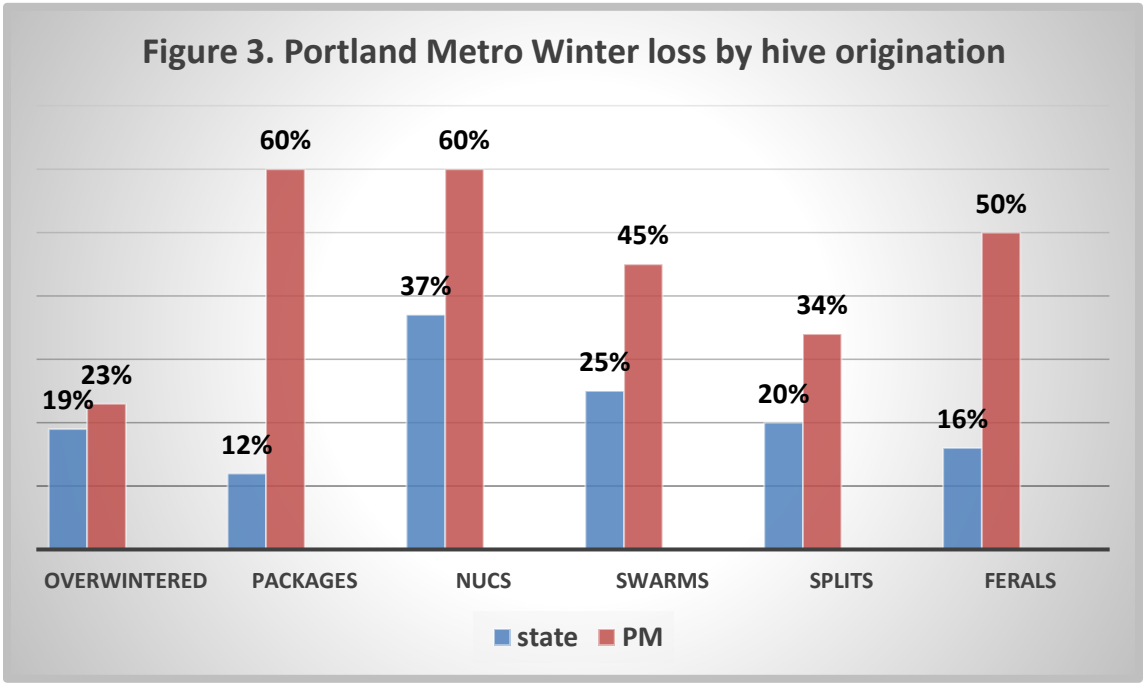
The 44 Portland Metro (PM) members reported on 333 fall colonies (range 1 to 45 colonies, average 7.6 colonies, median five colonies). **Portland Metro loss level was 31%**, 7 percentage points greater compared to the state loss level. Percent losses, determined for five hive types, is shown in Figure 2 below comparing PM (red bars) with the statewide backyarders (blue bars). PM member respondents (14) reported 102 fall Langstroth 8-frame and 34 individuals keeping 208 10-frames hives. Losses of the 8-frame Langs were 25.5% compared to 30% for the Lang 10s. Twelve of 18 fall nucs survived (33% loss, five individuals), a single Top

Bar hive survived but 3 Warre hives did not survive. For the other category a single long hive also did not survive.



Fall # PM    102                      208                      18                      1                      3                      1

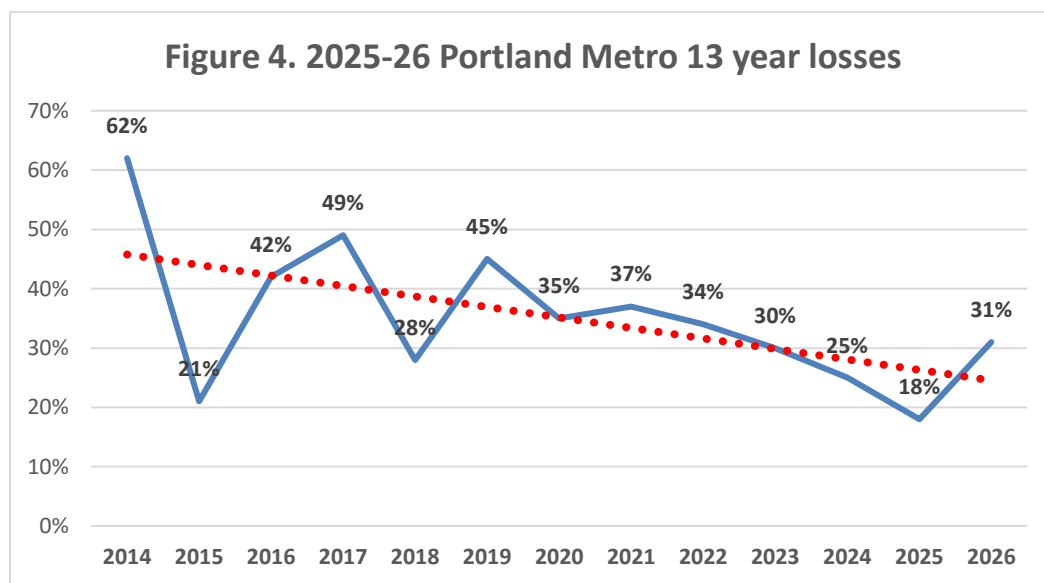
The survey also asked for hive loss by hive origination. Twenty-two (50%) used FAST TRACK and did not supply numbers. Of those 22 who did respond 15 said their previously



Fall # PM    53                      5                      15                      27                      53                      2

overwintered colonies, 53 had a 22.5% loss, 3 individuals who had 5 package colonies overwinter lost 3 = 60% loss and 6 individuals over wintered 15 nucs but 9 did not survive for also a 60% loss. There were 12 individuals that overwintered swarms – of 27 fall overwinters 12 died = 44.5% loss and 11 individuals overwintering 53 splits lose 18 for 34% loss. Of 2 ferals, one did not survive = 50% loss.

Losses for PM beekeepers have been decreasing. Figure 4, Red dotted line is trend.



### Who are the survey respondents?

The PM respondents to the electronic survey managed one to 45 fall colonies. Three individuals had one colony, all survived, eight respondents had two colonies, but all eight individuals lost their colonies, six individuals had three colonies of which eight died. For the 39% of individuals with 1, 2 or 3 colonies, overall loss rate was 70%. Eleven individuals had 4-6 colonies (29.5% loss) and the five individuals with 7-9 colonies had a 41% loss. The 10 individuals with 10+ colonies (206 colonies total) lost 25% of them' largest number was 45 colonies. Statewide and for Portland metro individuals with increasing numbers of colonies, the percentage of loss decreases.

Five individuals (11.5% of respondents) had 1, 2 or 3 years of experience (loss level 22%) twelve individuals had 4 to 6 years' experience (48% loss level), seven individuals had 7-9 years' experience (46% loss), the 15 individuals with 10 to 15 years' experience had a 30% loss and the 5 individuals with 20 to 50 years' experience lost 12.5% of their colonies. (50 the highest number of years.). There is no apparent correlation that with increasing experience, the percentage of colony losses decreases.

## Comparison of PM with Statewide

|           | 1-3 colonies            | 10+ colonies           |
|-----------|-------------------------|------------------------|
| PM        | 70% loss<br>(17 indiv)  | 25% Loss<br>(10 indiv) |
| Statewide | 34% loss<br>(199 Indiv) | 20% loss<br>(70 indiv) |

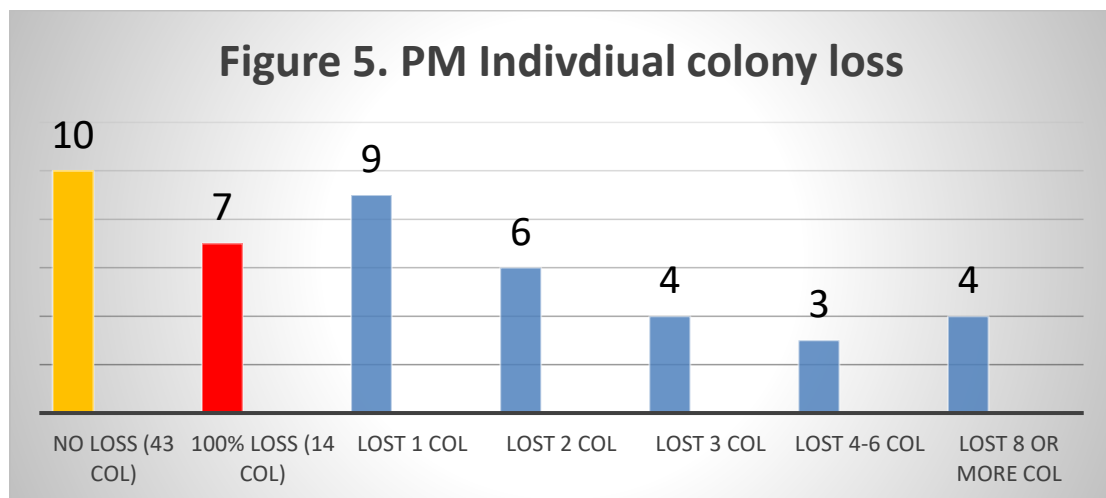
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|           | 1-3 years' experience            | 10+ years' experience   |
|-----------|----------------------------------|-------------------------|
| PM        | 22% loss<br>(5 indiv) (20 indiv) | 22.5% loss              |
| Statewide | 23% loss<br>(95 indiv)           | 22% loss<br>(104 indiv) |

## Some other numbers

Thirty-six of 44 PUB respondents (81%) said they had a mentor available as they were learning beekeeping; 76.5% statewide said they had a mentor.

Eight individuals had two apiary sites. Survival levels were the same at one, better at 3 and worse at 4 of the 2<sup>nd</sup> apiary sites. Three had a 3<sup>rd</sup> apiary site; colonies did the same at two and worse at the 3<sup>rd</sup>. Four individuals moved hives during the fall season; one moved two hives 100 feet, one moved a single hive a half mile for swarm collection and three hives were moved 10 miles for honey collection.



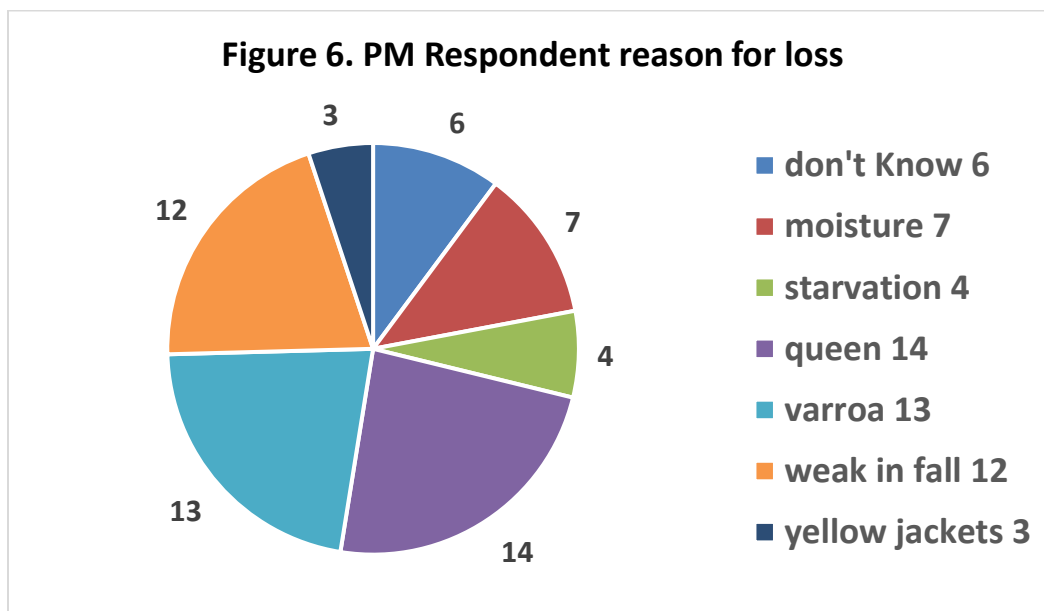
Not everyone had loss. Ten PM individuals (23%) reported total winter survival (43

colonies); unfortunately, seven individuals (16%) lost 100% of their colonies (14 colonies total). Greatest loss was a single colony (9 respondents), followed by six who lost two colonies. Heaviest loss was 13 colonies. Individual loss data is shown in Figure 5.

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

### Reasons for Colony Loss/Acceptable loss

We asked the 34 individuals that had colony loss to estimate what the reason might have been for their loss (multiple responses were permitted). Six individuals didn't know. For the remaining responses there were 58 total listings for PM, 2.1/individual. Most common listing was queen (13 respondents) and Varroa (13) and weak in the fall (12 respondents). Also listed as reason (not in Figure 6 below was Pesticide and poor wintering two each and one each listed CCD, absconding, mite treatment with formic acid and inexperience of beekeeper



Survey individuals are asked to indicate what might be an acceptable loss level. Four individuals said none, five said 5%, 9 said 10%, 2 said 15%, 8 indicated 20% (the median), 10 said 25% (most common selection), 2 said 33% (loss level most closest to actual average loss), 5 indicated 50%, and 1 each said 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 when

examining a deadout. 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 paralysis viruses (such as chronic bee paralysis virus (CBPV) 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. 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**

Respondents to the 2025-26 survey could FAST TRACK and not need to respond to the management questions. There were questions on seasonal managements of feeding/ winterizing/ sanitation + questions on screen board use + questions on monitoring + questions on varroa, both non-chemical and chemical control, + questions on queen rearing.

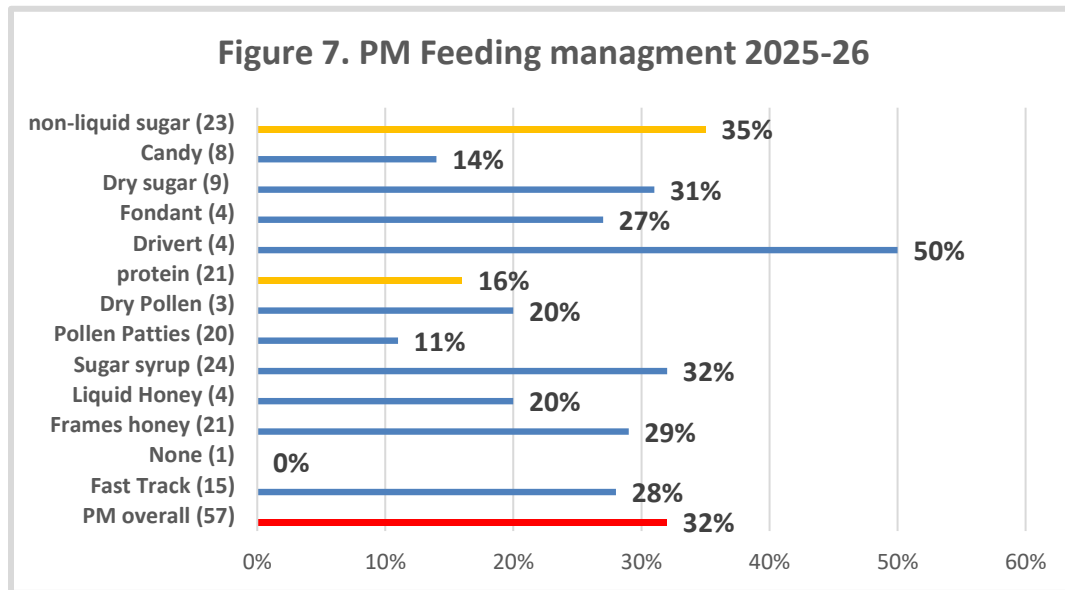
Several PM respondents elected to skip answering and with the one to several whose reason was none, numbers begin to become small - meaning the data is not very robust. I therefore recommend that you examine the larger data base of the statewide respondents and compare your results with those numbers.



**FEEDING:** For feeding management, 14 of the 43 PMBA respondents FAST TRACKED, they had 91 colonies and lost 36 = 28%, while the 28 who made selections had a 33% loss one percentage point greater than the club average. There was an additional person who said they did no

feeding managements; they did not lose any of their four colonies. This summary is therefore of 27 individuals with 140 colonies. Smaller numbers can sometimes skew the results. Figure 7 shows the feeding management results.

Non-sugar total was a higher percentage, but the eight candy feeders and four fondant feeders had the lower losses. Protein feeding in form of Dry pollen (3 individuals) or pollen patties (20 individuals) had one-half the loss of total respondents. The four members feeding liquid honey had a 20% loss level.



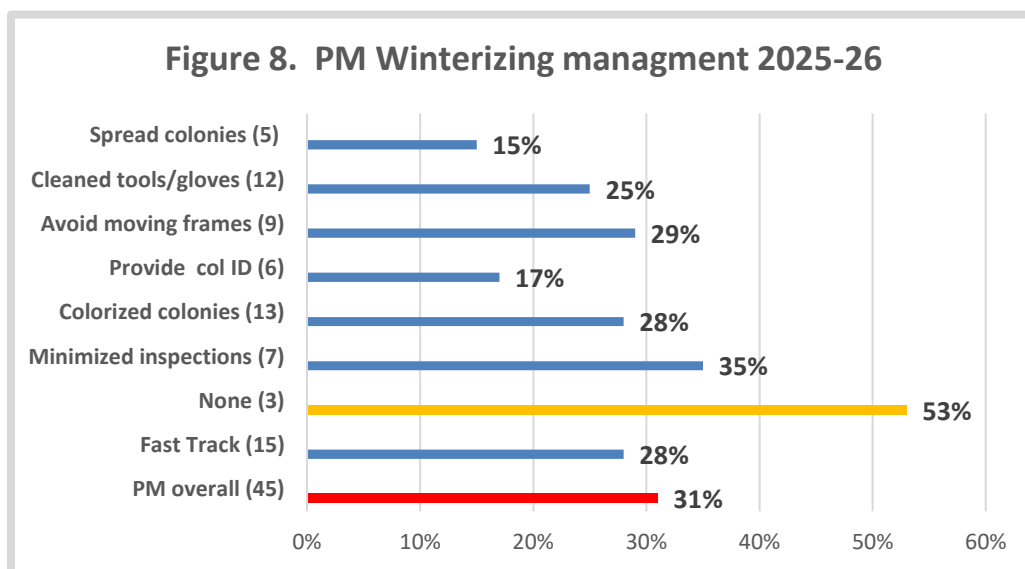
Individuals statewide that fed sugar syrup had a 0.5 percentage point lower loss level average for the last 10 years; this year it was again the same - 0.5 percentage point better survival. For PM respondents loss level was not different. Those feeding honey (as frames or liquid) had lower loss only during three of the past 10 years. This year loss level was the same as statewide average for those feeding liquid honey and 1.5 percentage points better survival for those 121 individuals who fed frames of honey. The four PM members feeding liquid honey had lower loss level (20%) than those feeding frames of honey (28%).

Individuals feeding non-liquid sugar (in any form) had lower losses eight of past ten past winter seasons. Dry sugar feeders had slightly better or equal survival 9 of 10 past winters; hard candy feeders had improved survival 9 of 10 past winters. The eight PM candy feeders had lowest loss.



**WINTERIZNG:** The 28 individuals providing responses (240 colonies) had a 32% loss rate. Two individuals making six choices had a 13% loss, the single individual with five choices had a 67% loss, the two with four choices had 60% loss, the six individuals with three choices had a 24% loss, the nine individuals with 2 choices had a 44% loss and the seven individuals with a single choice had a 31% loss. It is evident that winterizing success is not dependent upon doing a variety but which choices are most useful.

The most common wintering management selected was insulated top (78 individuals), had a 23% loss level and those eight individuals who wrapped had a 13% loss level.

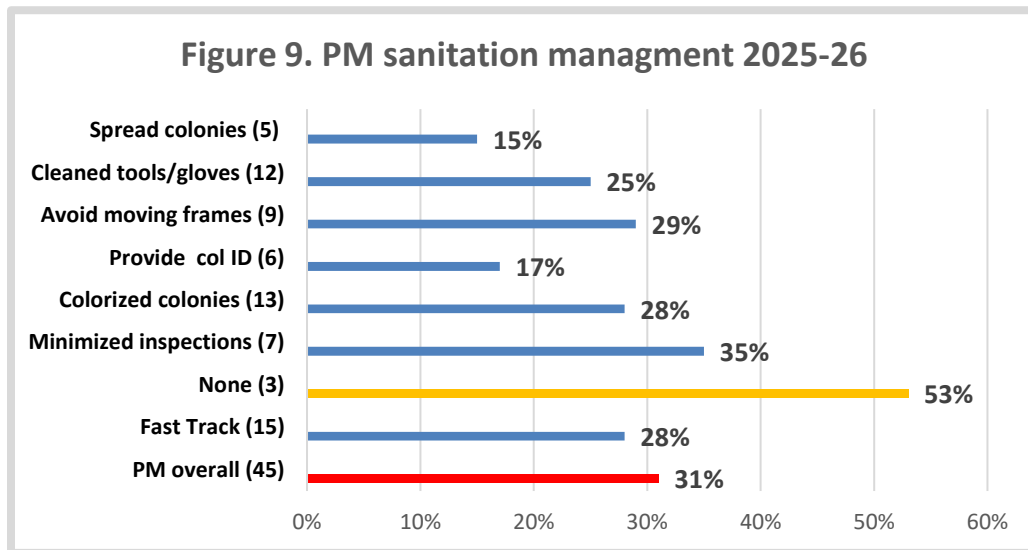


Statewide over the past eight years, individuals that did no winterizing practice (average 10% of individuals averaged 6.5 percentage point poorer survival rate; for PM the two who did not do any winterizing (of those who did not FAST TRACK) had a 67% loss but it was merely two individuals with three total colonies.

The winterizing management statewide that had the best survival was equalizing colonies, but this was not evident for the PM respondents. Use of an insulated top winter management improved survival 7 of 8 years (8-year average a 6.3-percentage point improvement); this year for PM it was a nine-percentage point improvement. Individuals who wrapped colonies also did better statewide and especially for the eight PM respondents.



**SANITATION:** 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 52 responses for this survey question 2.2/individual. Among the 26 PM respondents, three (36 colonies) said they did none of the selections – they had a 52% loss. Over the past five years statewide, 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.



The two selections that reduced losses were providing distinctive ID measures and to spread colonies. This was practiced by only six and five individuals respectively. The best management statewide for several years was to paint hive bodies assorted and doing other managements to avoid drifting. Overall, sanitation appears to be relatively minor toward improving survival.

## SCREEN BOTTOM BOARDS (SBB)

Although many beekeepers use SBB to control varroa, the annual PNW survey has clearly pointed out they are not a highly effective varroa mite control tool. In this recent survey, one said they did not use screen bottom boards - they did not lose their single colony, 11 individuals used them on some of their 171 colonies (34% loss) and 17 individuals used on all their colonies (70 colonies - 30% loss). Average non-use statewide for the last ten years is 16%, vs 84% use, on some or all colonies. The ten-year average of the 84% using SBB on all or some

of their colonies statewide was 32.2% loss level whereas the 16% not using SBB had loss rate of 35.2%, a 3-percent positive survival gain for those using SBB versus those not using them.



this was not evident for PM last season.

We asked if the SBB was left open (always response) or blocked during winter. This past season, 23 PM individuals, said they always or sometimes blocked SBB during winter – they had loss of 35% whereas the six who did not block had only a 22% loss. Statewide those who blocked always or sometimes had a 19% loss rate while those who never blocked had a 32.5% winter loss. In most years there was an advantage in favor of closing the SBB over the winter period to improve survival, but

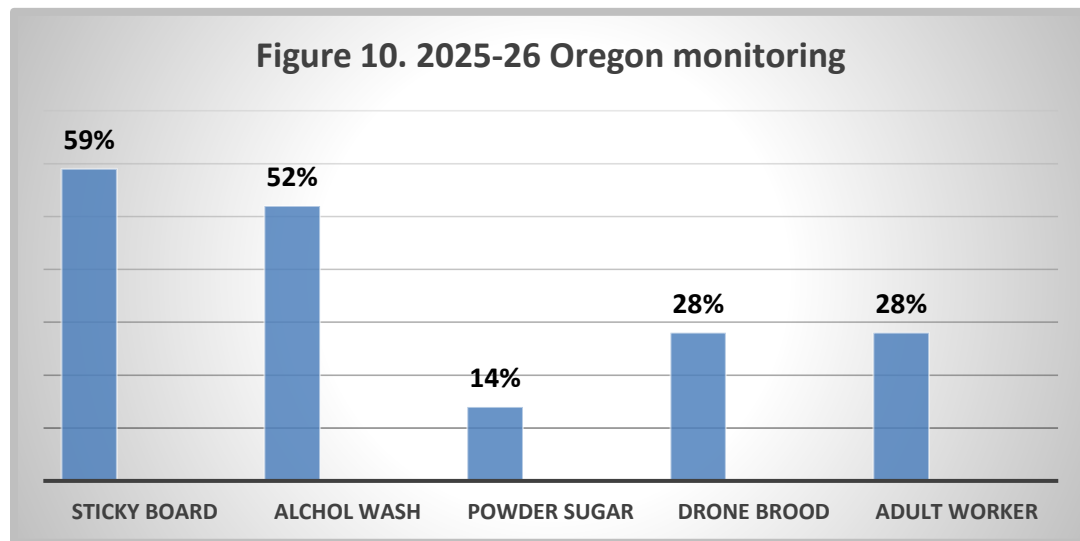
## Mite monitoring/Sampling and Control Management

Twenty-eight Portland Metro individuals that monitored had a 30% loss and the 15 not monitoring had less losses – 22%. Data for last 9 years of statewide response is in table below. Monitoring appears to be of benefit although not evident for PM this past year.

|                 | ALL Colonies<br>Monitored<br>%<br>individuals | % Loss | SOME<br>Colonies<br>Monitored<br>% individuals | % loss | No colonies<br>Monitored<br>% individuals | % loss |
|-----------------|-----------------------------------------------|--------|------------------------------------------------|--------|-------------------------------------------|--------|
| 2026            | 64.5%                                         | 19%    | 19%                                            | 25.5%  | 17%                                       | 28%    |
| 2025            | 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 |                                               | 36%    |                                                | 35.5%  |                                           | 42.5%  |

The 28 PM individuals indicated use of 55 monitoring techniques (more than a single choice could be used). Numbers and loss rate were nearly the same. Sticky boards (12 users), powdered sugar (11 users) and alcohol wash (9 users) all had 22% loss levels. The 12 individuals using drone brood sampling method had 20% loss and the 11 who examined adult bees had

22% loss. In the past 5 years statewide, the use of sticky boards has decreased, and alcohol washing has increased in use. Figure 10 illustrated statewide monitoring



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.

There were 40 PM responses to when sampling was conducted. The most common sampling of respondents is both pre- and post-treatment (13 individuals - 38% average loss). Seven individuals aid they treated without sampling and had a 23% loss. Two individuals who sampled but did not treat had an 82% loss. Those four who sampled pre-treatment had an 11% loss. Small numbers give widely varying results. It is important to know if the treatment works so post treatment should not be avoided.

**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. 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 of the numbers of mites reproducing in drone cells.

See the 9<sup>th</sup> edition of ***Tools for Varroa Monitoring Guide*** from the Honey Bee Health Coalition website [www.honeybeehealthcoalition.org/varroa](http://www.honeybeehealthcoalition.org/varroa) . The Tools guide suggests 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 not to 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 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 or bees suffering for mite transmission of viruses.

## Mite Control Treatments

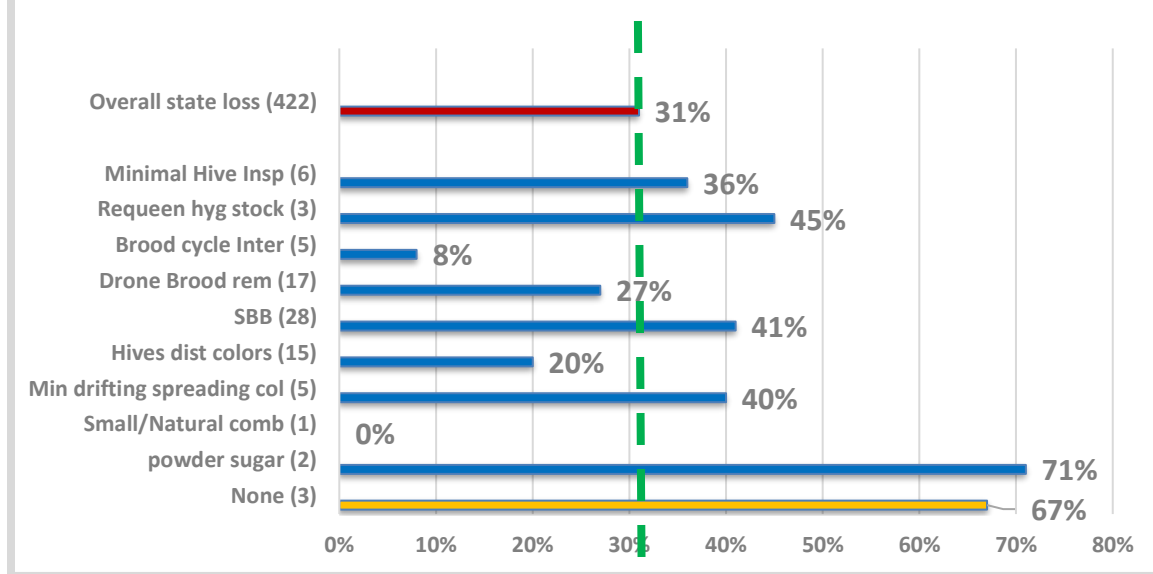
The survey asked about non-chemical mite treatments and about the use of chemicals for mite control. Seven individuals used FAST TRACK – they had a 39% loss level. Three individuals said they did no non-chemical treatments – of nine fall colonies six were lost – 67% loss level. Two individuals said they did no chemical treatment – of 11 colonies they lost eight for 73% loss.

**Non-Chemical Mite Control:** Individuals selected 82 total treatments. 2.3/individual. Of nine non-chemical alternatives offered on the survey (+ other category,) 6 individuals (17% of respondents excluding the 3 individuals who selected none) used one method (and had a 26% loss level), 11 (31%) used two (27% loss), 10 used three (34% loss), 3 used 4 (33% loss), 1 used 5 (75% loss) and a single individual used 6 and did not lose any of 3 fall colonies. With small numbers no clear pattern emerged but generally for the statewide beekeeper response as more selections were indicated the loss level was reduced.

Twenty-eight individuals (80% of total respondents – same as statewide respondents) listed use of screened bottom board. Statewide the loss level was one percentage point higher than average; for PM it was 41%, 10 percentage points higher than the club average. The use of the remaining selections for Portland Metro beekeepers is shown in Figure 11; 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.

Brood cycle interruption - 5 individuals, 96 colonies had the best improvement in loss percentage and using distinctive colors for hive also was helpful in reducing losses. Two of the non-chemical alternatives have demonstrated reduced losses statewide over the past several survey years. Reducing drifting such as spreading colonies and brood cycle interruption have consistently, year after year, demonstrated somewhat better survival than average loss. Different colony colors in apiary and drone brood removal (20% loss) were helpful managements over the years.

**Figure 11. 2025-26 PM Loss w/ non-chemical varroa control**



**Chemical control:** For mite control via use of chemicals, two individuals (11 colonies) of total respondents not using Fast track) used NO chemical treatment. They had a loss level of 73%. The seven individuals who used FAST TRACK and did not supply information had a loss level of 39%. Those using chemicals used at a rate of 2.3/individual last year, same as in the previous year. The number of times a chemical was used was captured in the survey.

**Apivar:** Of the four individuals who used Apivar, the synthetic miticide amitraz, one respondent reported using it twice and the remaining three used it once. Loss level was the lowest of all chemical treatments at 9%. As shown in Figure 12.

**Essential Oils:** Apiguard, the essential oil gel, had only a gain of one percentage point over PM average – 30% loss level. It was used twice by four individuals, and once by eight individuals. ApiLife var was used once by one individual with four colonies but three were lost.

**Formic Acid:** Formic acid is a powerful acid capable of causing collateral damage to the bee brood and is sometimes a queen killer. Two individuals used it one twice and one a single time. Overall, the 20 colonies treated with formic did not do very well with only five survivors.

**Hopguard:** this is another miticide acid. Only one individual used it and their single colony survived.

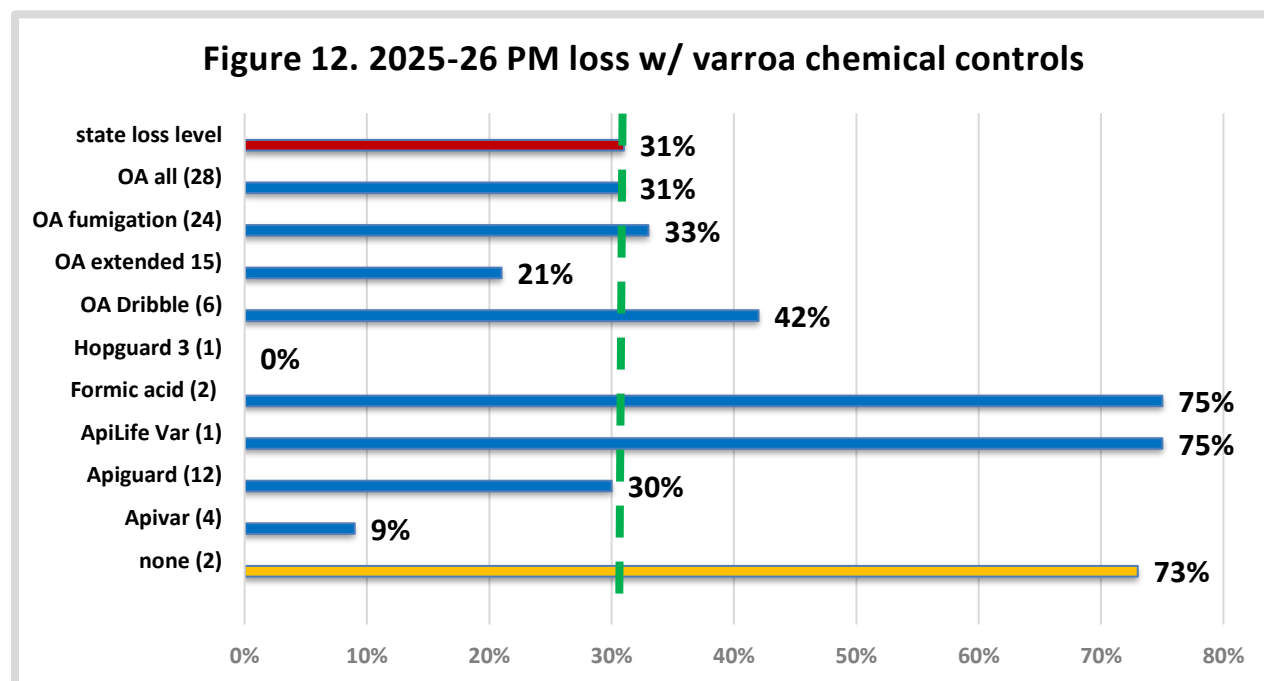
**Oxalic acid:** the vast majority of individuals using a chemical to treat for mites used oxalic acid in one of three ways, as drizzle (OAD), vaporization (sublimation – OAV) and oxalic acid in absorbent pads meant to keep oxalic acid in the hive for an extended period (OAE), available for the first time late in the year as VarroSan. Overall, oxalic acid was used on 241 fall colonies and had a 31% loss level.

**QAD:** One individual drizzled three times and five used it once. Overall, the six individuals using OAD had a 42% loss level.

**OAE:** This is a relatively “easy” way to use oxalic acid. Fifteen individuals used it to control mites and collectively had only a 21% loss. Two individuals used it 6+ times, three individuals using it 3 times, six individuals used it twice and 4 individuals used it once.

**OAV:** A total of 18 individuals used oxalic acid vaporization to control mites. They did this on 221 colonies. Four individuals used OAV 6+ times, 7 used it four times, 5 used it 3 times, and four each used it twice and once.

Consistently, over the last 9 years, four different chemicals have helped beekeepers improve survival statewide. These were the synthetic Apivar, essential oils Apiguard and ApiLifeVar and Oxalic acid vaporization. For Portland Metro beekeepers oxalic acid drizzle did not do as well this year (42% loss level), but OAE did very well in promoting better than average survival (21%). For most chemicals results from using more than once are not illustrative of what number of times is most useful, but numbers are small for most.



**Closing comments**

I intend to continue to refine this instrument each season and hope you will join in response next march/April. I have a blog on the [pnwhoneybeesurvey.com](http://pnwhoneybeesurvey.com) and will respond to any questions or concerns you might have. Email me directly for quicker response:

[dmcaron@udel.edu](mailto:dmcaron@udel.edu)

I whole heartedly thank Jenai Fitzpatrick, former PM member (she has had to get out of bees due to an allergic reaction) who has been an invaluable assistant through the years with the data and to Bill Cauterall who has been our webmaster for PUB and who has graciously continued with the loss survey. For different reasons, neither individual now keeps honey bees, so for both this is a labor of love. Both say it is payback to those years they had bees and the wonderful friendships developed among the beekeepers.

**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.

2026

Dewey Caron May