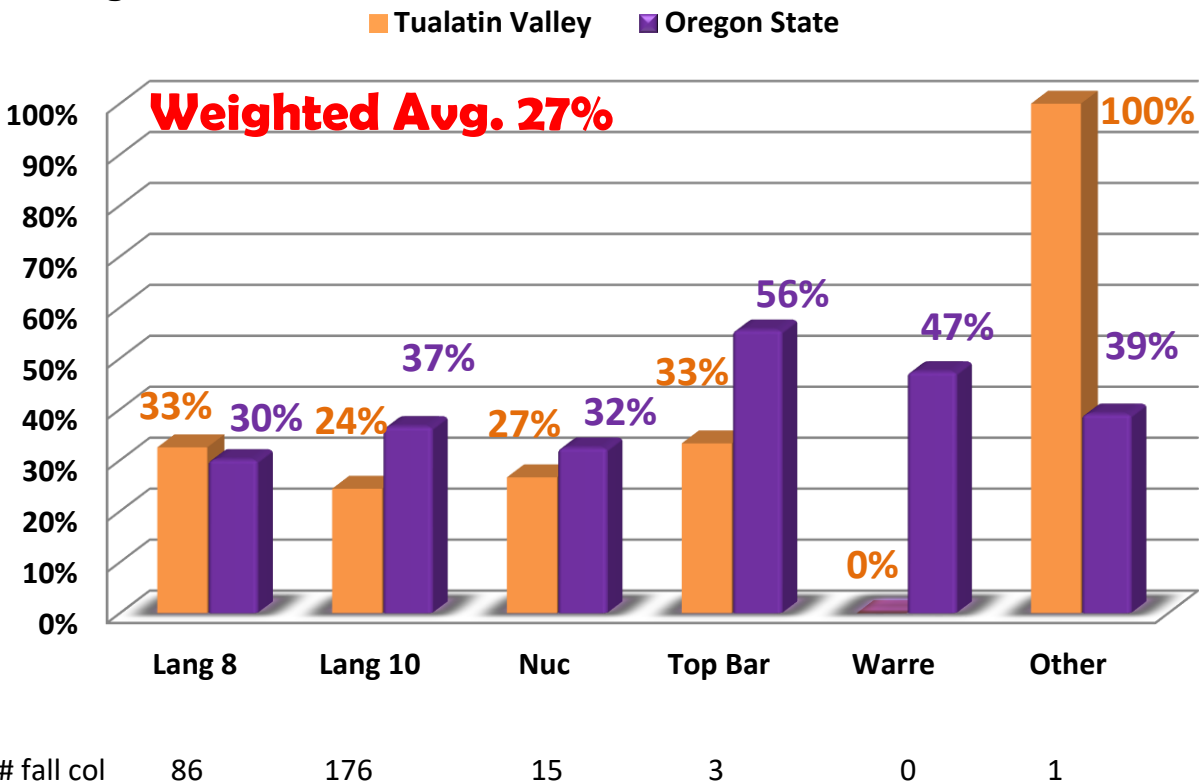


## 2020-2021 TVBA Winter Loss Report by Dewey M. Caron

Tualatin Valley Beekeepers were encouraged to complete a web-based survey document in a continuing effort to define overwintering losses/successes of backyard beekeepers in Oregon and Washington. This was the 12<sup>th</sup> year of such survey activity. I received 328 responses from OR backyarders, keeping anywhere from 1 to 40 colonies; TVBA members sent in 57 surveys, 4 more than last year, reporting on 281 fall colonies.

**Overwintering losses of TVBA respondents =27 %**, an improvement from last year (losses last year were 42%). **TVBA losses were the lowest of a dozen Oregon clubs and the 2<sup>nd</sup> lowest in the past 10 years.** Loss level was 13 percentage points lower than the 10-year average losses. Percent losses, determined by hive types were 33% Langstroth 8 and 24% for Langstroth 10 frames hives. Nuc losses (15 total fall nucs) were 27%. Of three Top bar hives one was lost. One “other,” a valkyrie (horizontal) hive, did not survive.

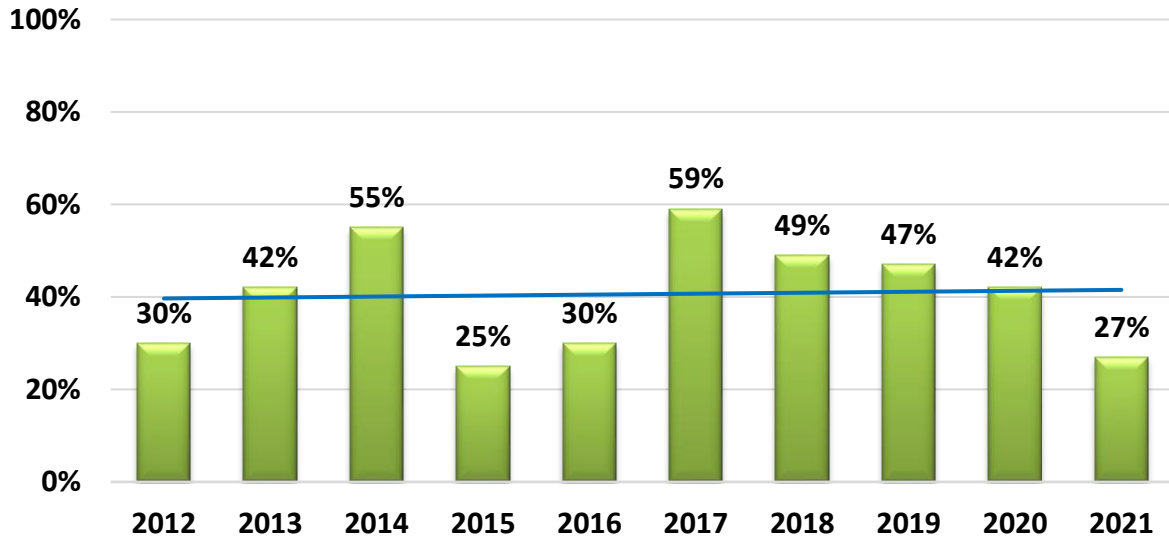
**Figure 2 Winter Honeybee Loss % by Hive Type, 2020-21**



The attached figure below shows TVBA losses for past 8 years. Solid line is loss trend – basically average losses have been at the same level (40%) for the past 8 years.

Figure 3

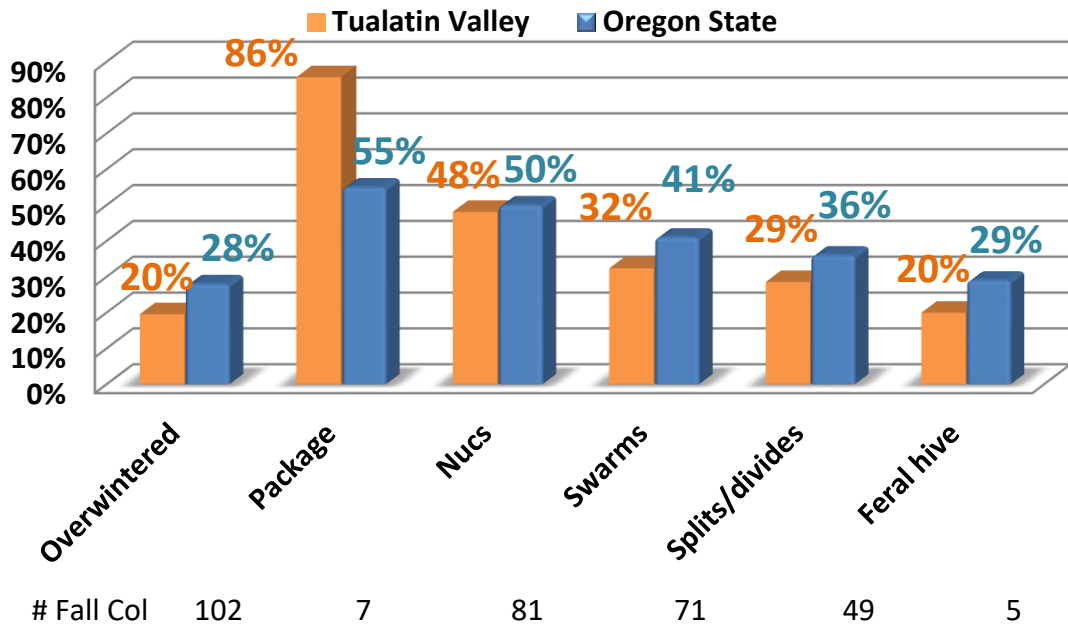
### Tualatin Valley Loss History



The survey also asked for hive loss by **hive origination**. The members reported 20% loss of previously overwintered colonies, a heavy 86% loss of the 7 packages (only one survived), while nuc (48%), swarm (32%) and split (29%) losses were intermediate. Four of five feral transfers survived.

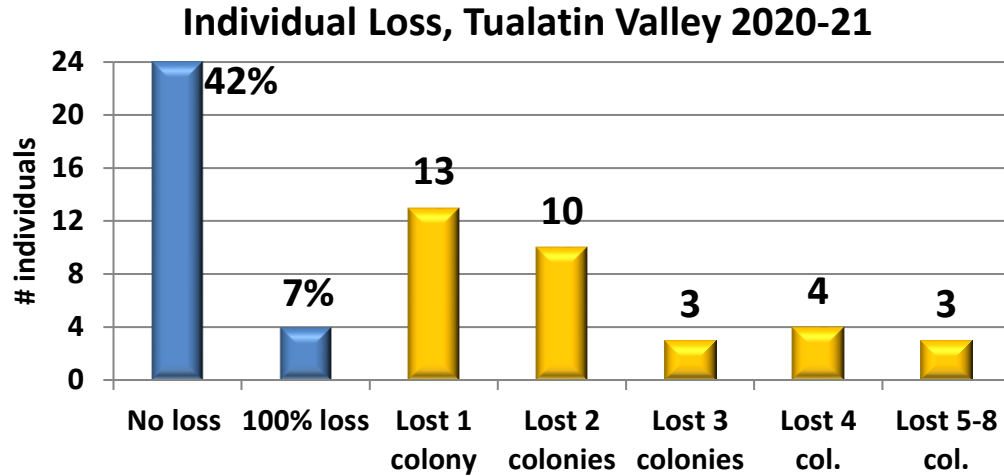
Figure 4

### Winter Honeybee Loss % by Origination, 2020-21



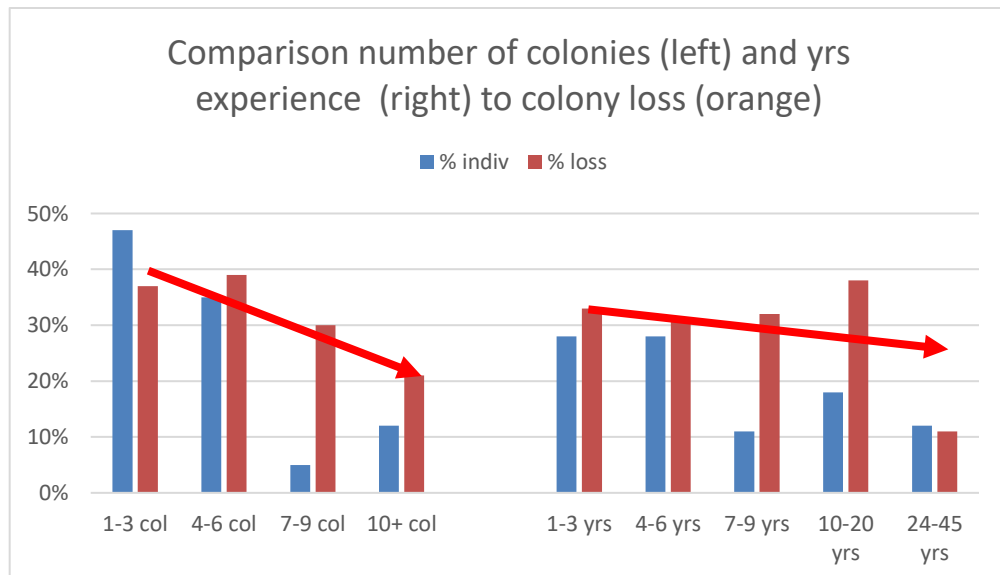
Not everyone had loss. In fact, 24 members reported NO LOSS (42% of survey respondents) while only 4 respondents (7%) reported total winter loss of colonies. Largest loss number was 1 colony. Highest loss by one individual was 8 colonies.

**Figure 5**



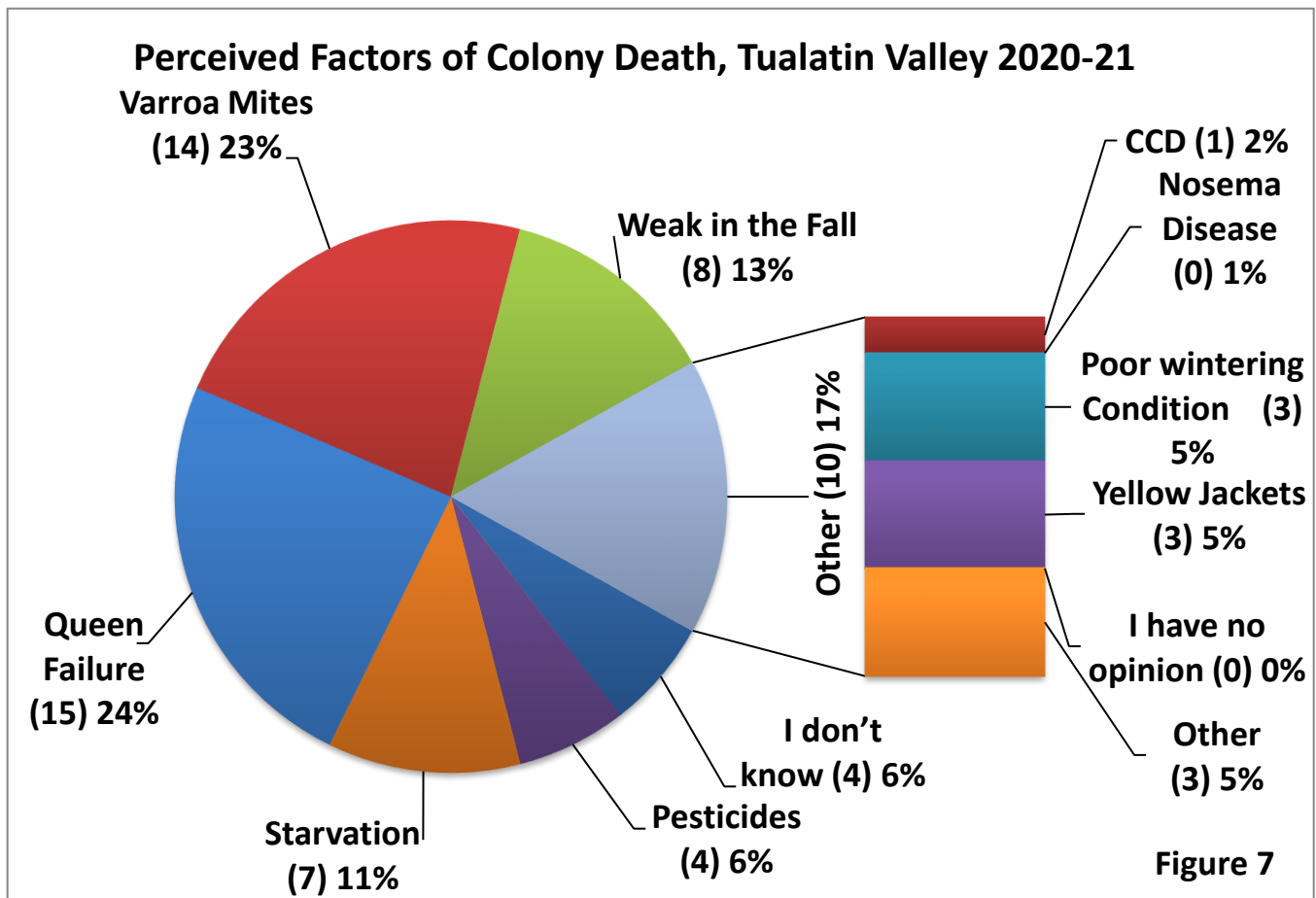
Typical of the statewide data, the TVBA respondents are largely new beekeepers. 47% of TVBA respondents had 1 to 3 fall colonies, another 35% had 4 to 6 colonies while 6 respondents (10½ %) had 10+ colonies – maximum number for any respondent was 40 colonies. As colony numbers increase colony losses decrease. The TVBA beekeepers are typical of statewide in years experience. Sixteen individuals had 1-3 years experience (loss level 33%) and another 16 had 4-6 years experience (loss level 31%. Six had 7 or 8 years (loss level 32%) and 10 had 10+ (38% loss level and 7 had 24 to 45years experience( the largest number of years experience). Colony losses did not decline until the very highest level of experience (see arrows Figure 6).

**Figure 6**



## Reasons for Colony Loss/Acceptable loss

We asked of individuals that had colony loss to estimate what the likely reason(s) might have been, Multiple responses were permitted. Fifteen individuals said queens (45% of those with loss, 24% of selections) of those having losses (recall that 24 individuals had no loss) and 14 individuals said Varroa mites (42% of individuals, 23% of total choices). Eight individuals said weak in fall and 7 respondents (21% of total respondents, 13% of choices).said starvation. 5 individuals



said poor wintering conditions, 4 indicated pesticides were involved in losses or didn't know and three (9% individuals, 5% of total choices) said yellow jackets and other. Under other the listings were: they left, moisture and queen excluder left on over winter.

When asked about an acceptable level of loss (acceptable not defined – discretion of individual respondent), 12 individuals (21%) said none. The greatest selection was 20% by 15 individuals (also the median) and median of statewide respondents. Eight and five individuals (23%) respectively said 33 or 50% loss was acceptable. See numbers below in table.

**Acceptable Overwinter  
Loss per 57 Beekeepers  
in  
Tualatin Valley during  
2020-21**

Loss level	5%	10%	15%	20%	25%	33%	50%	75%	100%	None	Other
#	2	4	2	15	9	8	5	0	0	12	0
%	4%	7%	4%	26%	16%	14%	9%	0%	0%	21%	0%

### Why colonies die?

There is no easy way to verify reason(s) for colony loss. Colonies in the same apiary may die for different 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.

Major factors in colony loss are mites and their enhancement of viruses especially DWV (deformed wing virus) and declining nutritional adequacy/forage and diseases. Pesticide exposure 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 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 facing honey bees in the current environment.

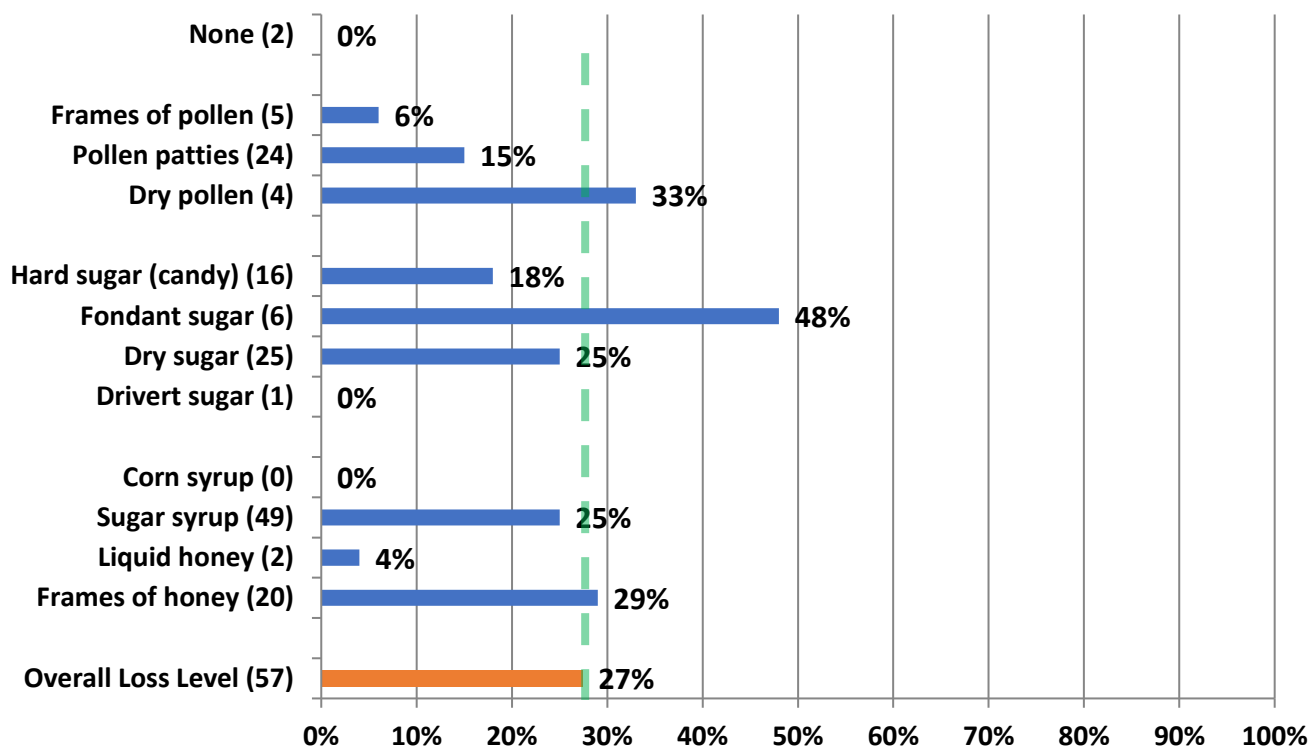
### Management selections and losses

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 TVBA and OR 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.

**FEEDING:** TVBA survey respondents checked 154 feeding options = 2.8/individual (statewide it was 2.9/individual). Seven individuals selected a single choice (they had a 35% loss) – five of the seven selected sugar syrup, 18 chose 2 (51% loss), 18 also had 3 choices (median number – 18% loss), 8 individuals indicated 4 choices (22% loss) and 4 individuals had 5/6 selections – they had an 8.5% loss level. Greater number of selections results in better survival.

Figure 8

**Feeding Options w/ Loss Record**  
**(#) = number individuals**



Percent colony losses are presented for feeding options with numbers of TVBA members indicating doing the management in ( ). Bar lengths of left of 27% (green dashed lines) indicate better than average survival while those to right had heavier than average losses. An anomaly in the data – 2 individuals doing no feeding (4 colonies total, 15.5 years experience average) had 100% survival. The previous 4 years, those doing nothing (2.75 persons average) had a 67% loss level (range 48-86%).

Forty-nine individuals (of 55 total doing some feeding) fed sugar syrup. Loss level was 25%. Twenty individuals feeding frames of honey had 29% loss level, neither different from the average TVBA loss level. The 2 individuals feeding liquid honey had only a 4% loss; these two individuals also did 6 different feedings which might better explain their lower survival.

Twenty-four individuals feeding pollen patties had ½ the average loss. The 5 feeding frames of pollen had even better survival, but dry pollen feeders did not (33%). However, over the last four years (including this year) an average of 6 TVBA dry pollen feeders had a 27.5% loss level compared to the average TVBA loss level of 38.5%.

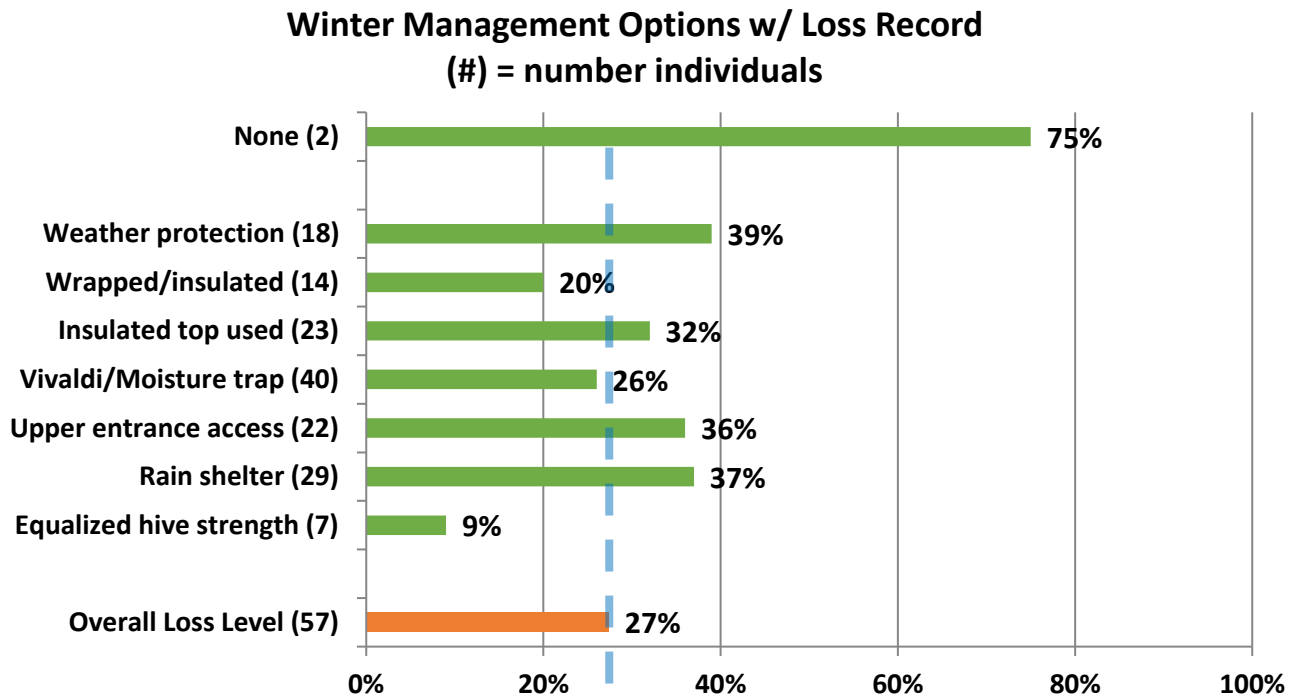
Dry sugar and hard candy feeding individuals had better survival this past winter. Dry sugar feeders had slightly better survival all 5 winters (average= 37%, 4 percentage points better than 41%

average) while hard candy feeders had a much-improved survival 4 of 5 past winters (this past winter was the exception) (=33% average survival). Fondant feeders had better survival 3 of the 5 (but not this past winter which was also the case for the 6 TVBA fondant feeders). The one drivert feeder (individual had a single colony) had no loss.

**WINTERING PRACTICES:** Two TVBA individuals (4%) reported doing no winterizing; they had loss level of 75%; statewide these 2 were among 42 individuals (13% of overall statewide respondents) that indicated none of the several listed wintering practices; statewide losses were 39% for those doing no winterizing managements, 4 percentage points higher loss than overall state loss of 35%. Multiple selections were possible and in fact the 55 TVBA members averaged 2.9/individual. Eleven individuals chose a single management and had a 17% loss level, 15 chose 2 (22%) loss, 12 had 3 selections (58% loss), ten had 4 (42%) while the seven individuals checking 5 to 8 had a 15% loss level. This was a strange distribution with one or two selections and 5+ the most promising for survivorship.

The two most common wintering managements selected was use of a Vivaldi/moisture trap/quilt box at colony top (40 individuals, 73%) but it was at the average for TVBA total. Rain shelter (29 individuals statewide (53% of TVBA respondents) did not result in improved survival, 10 percentage points over TVBA average loss. Figure 9 shows number of individual choices for TVBA members in ( ) and percent loss of each selection. The seven TVBA individuals who equalized hive strength had the best survival (9% loss rate).

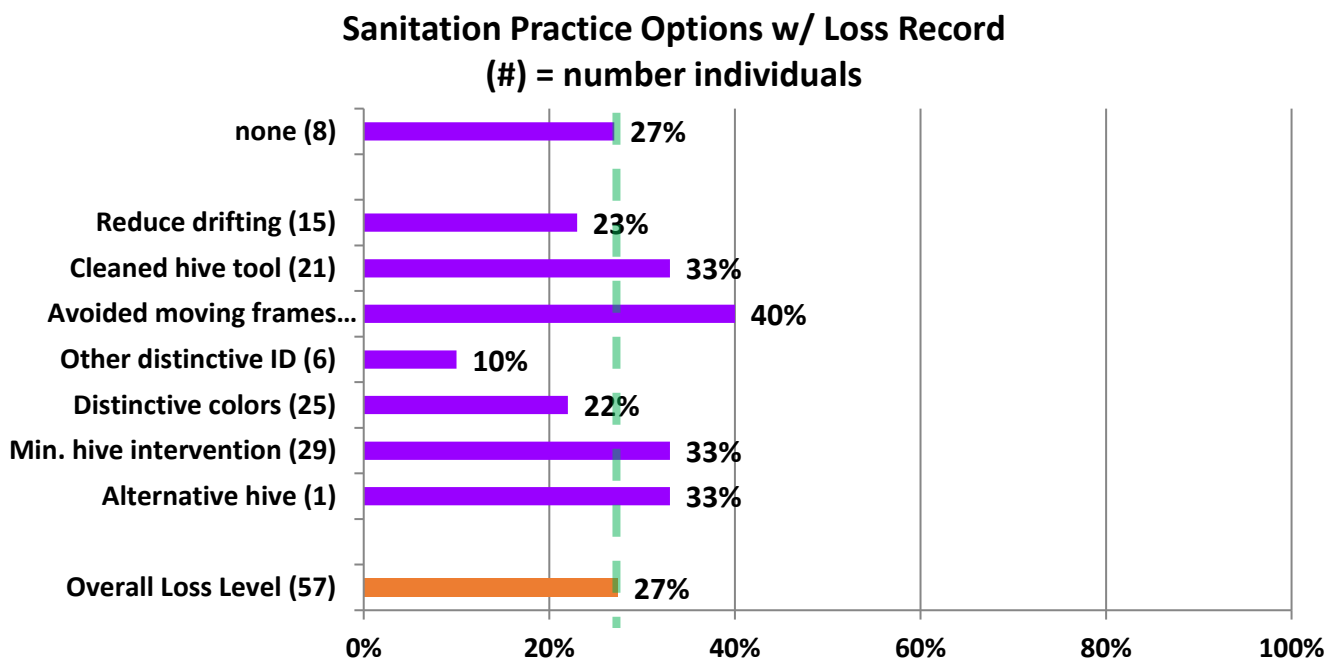
**Figure 9**



Over the past four years statewide individuals that did no winterizing practice (average 13.4% of individuals) averaged 46% loss compared to 42% overall average loss of last 4 years, a 4-percentage point poorer survival rate. Only 2 winterizing managements improved survival all 4 years – wrapping (29% lost rate, a 13-percentage point improvement) and upper insulation (32%, a 10-percentage point improvement). Wrapping also showed better survival for TVBA members this year. Vivaldi/quilt box (38%), upper entrance, also 38% (most Vivaldi boards have an upper entrance built into the equipment) and wind/weather protection (36%) had only slightly improved survival rates compared to average loss rate for last 4 years statewide. Equalizing colony strength has averaged 6 TVBA participants the last 3 years with average loss of 15.7%. TVBA average losses for the same period has been 38.7%, so this management seems to be very helpful in improving survival.

**SANITATION PRACTICES:** It is critical that we practice some basic bee sanitation (some prefer use of term bee biosecurity) in our bee care to insure healthy bees. TVBA beekeepers had 130 responses 2.7/individual. Nineteen percent statewide including 8 TVBA individuals (14%) said they did not practice any of the 6 offered alternatives. Loss rate statewide was 72%%; over past four-years those indicating doing none had a 52.5% percent loss rate, 10+ percentage points higher than the average statewide loss rate of 42% over the same time period. Fourteen TVBA members had 1 selection (loss rate 32%), 14 also made 2 choices (also 24% loss), 9 made 3 choices (19% loss); eight individuals had 4 (50% loss – primarily due to the 2 highest colony number individuals having heavy (100% & 86% losses) and four had 5 or 6 selections; they had a 12,5% lose rate.

**Figure 10**





The managements that improved survival included reducing drifting (15 individuals), taking other measures to distinctively ID colonies (6 individuals) and distinctive colors of hives (25 individuals). Avoiding moving frames and reducing drifting were the two sanitation choices that demonstrated better average survival statewide the past four years – 4-year loss rate was 36% for not moving frames which is 6 percentage points better survival and 35% for reducing drifting compared to overall rate of 42%. For TVBA members this year avoiding moving frames (23 individuals) did not improve survival (40% compared to club average of 27%) nor did it last year. Sanitation appears to be relatively minor toward improving survival.

## SCREEN BOTTOM BOARDS (SBB)

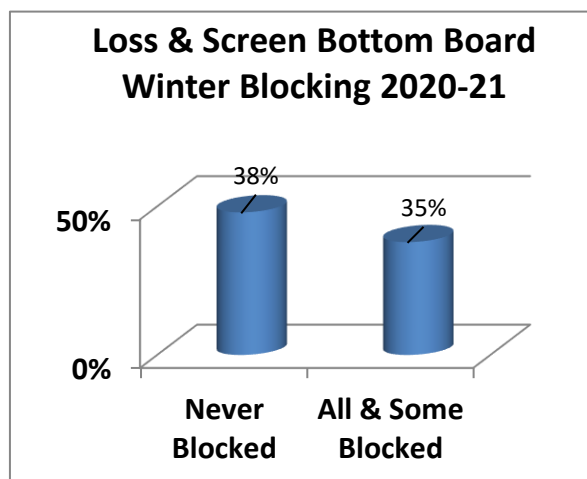
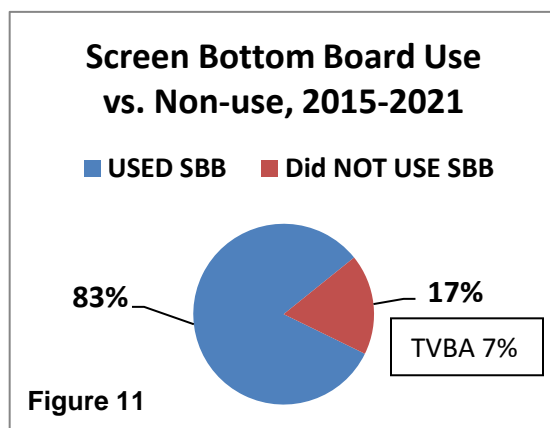
Although many beekeepers use SBB to control varroa, BIP and PNW surveys clearly point out they are not a very effective varroa mite control tool. In this recent survey 4 individuals (7%) said they did not use screen bottom boards. Average non-use statewide is 17%, vs 83% use, on some or all colonies over the 7-year period. Figure 11 right.

This past overwintering season, the 4 non-SBB users lost 6 of 15 fall colonies for 40% loss. The TVBA beekeepers using SBB on all or some of their colonies had 26% loss.

**Examining the six-year average of SBB use statewide, loss level of the 83% using SBB on all or some of their colonies had a 36% loss level whereas the 17% not using SBB had loss rate of 40%, a 4-percentage point positive survival gain for those using SBB versus those not using them. Screen bottom boards offer a minor improvement for overwinter survival.**

We asked if the SBB was left open (always response) or blocked during winter. This past season, 53%, 29 TVBA individuals (22%) , said they always blocked SBB during winter; 14 individuals statewide said they blocked some of the SBBs and 12 individuals (22%) said they never blocked. Those who never blocked had 42% loss while those who did always or sometimes had a 24% loss rate, a difference of 18 percentage points. Statewide those who blocked always or sometimes had a slight advantage **in favor of closing the SBB over the winter period to improve survival.** Figure 12 right.

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. This was especially true for TVBA members this past winter.

**Things that seem to improve winter success:** It should be emphasized that these comparisons are correlations not causation. They are single comparisons of one item with loss numbers. Individual beekeepers do not do only one management, nor do they necessarily do the same thing to all the colonies in their care. We do know moisture kills bees, not cold, so we recommend hives be located in the sun out of the wind. If colonies are in an exposed site, providing some extra wind/weather protection and wrapping/insulating colonies might improve survival.

Feeding, a common management, appears to be of some help in reducing losses. Feeding fondant sugar, a hard sugar candy or dry sugar during the winter means lower loss levels. Providing frames of honey and feeding sugar syrup also yields lower losses for some individuals. Such feeding management is of great value for spring development and/or development of new/weaker colonies as well as for colony rearing of bees to overwinter. Feeding protein in form of dry pollen and pollen patties did slightly improve survival. The supplemental feeding of protein as pollen patties or dry pollen might be of assistance earlier in the season to build strong colonies and in the fall to build the fat bee population needed for successful overwintering. To determine if feeding might help monitor what sources your bees are visiting and manage accordingly.

Winterizing measures that apparently helped lower losses for some beekeepers were a moisture trap (Vivaldi board or quilt box) and upper insulation and wrapping the colonies (or otherwise adding some insulation) to provide added protection against the elements. Spreading colonies out in the apiary and doing other measures to reduce drifting also appeared to be of some value in reducing winter losses. Avoiding movement of frames from one colony to another might also improve survival but the gain over what this interchange might accomplish to bolster weak colonies and start new divides might be greater than a minor advantage in survival.

It is clear that doing no feeding, winterizing or sanitation resulted in the heaviest overwinter losses.

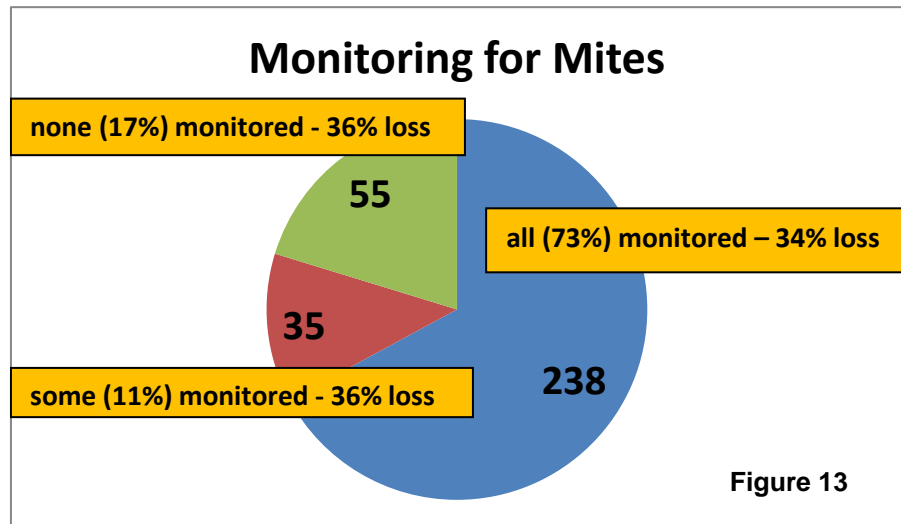
Replacing standard bottom boards for screened bottoms marginally improved winter survival. It is apparently advantageous to close the bottom screens during winter.

## **Mite monitoring/Sampling and Control Management**

We asked percentage of Oregon hives monitored for mites during the 2020 year and/or overwinter 2020-21, whether sampling was pre- or post-treatment or both and, of the 5 possible mite sampling methods, what method was used and when it was employed. Statewide 238 individual respondents (73%), 6 percentage points over the previous year, said they monitored all their hives. Losses of those individuals monitoring was 34 %. Fifty-five (17%), 3 percentage points fewer than last year, reported no monitoring; they had a higher loss rate of 36% loss. 35 individuals reported

monitoring some of their colonies; they had a 36% loss. For TVBA 38 individuals ((67%) monitored all hives, 6 (11%) monitored some while 13 (23%) did not monitor. Loss levels were reversed as shown.

TVBA numbers  
 None (23%) –19% loss  
 All (67%) – 27% loss  
 Some (11%) – 40% loss

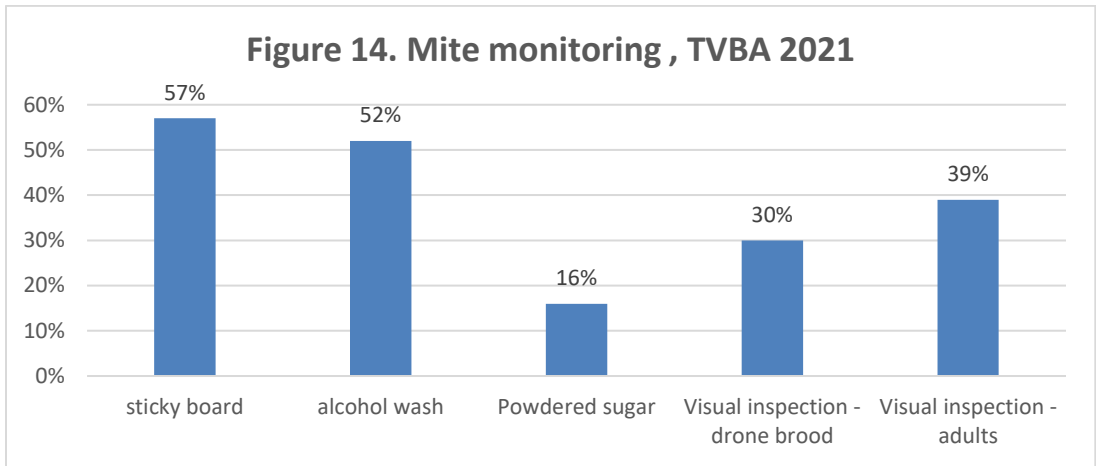


Monitoring alone has been shown to improve winter survival although TVBA and statewide numbers don't support that this year. The table below compares % individuals and % winter loss for individuals statewide who monitored all colonies compared with those who monitored none. Five-year difference is 8 percentage point better survival monitoring all colonies. The 13-15% who monitored some colonies was variable.

	<b>ALL Colonies Monitored</b> % individuals	% loss	<b>SOME Colonies Monitored</b> % individuals	% loss	<b>No colonies Monitored</b> % individuals	% loss
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%
4-year loss age		40%		38%		48%

Individuals indicated use of 1.9 monitoring techniques on average. In total choices, in order of popularity of use, Sticky boards were used by 25 individuals, 57% of 44 individuals who did some or all monitoring of colonies. Twenty-three individuals used alcohol wash to monitor (52% of total number of individuals who monitored, the highest percentage of all clubs), and only 7 individuals (16% of individuals) used powdered sugar monitoring; visual inspection of drones (13 individuals) and visual inspection of adults (17 individuals) were also indicated (Figure 16). In past 5 years, the use of sticky

boards has decreased in use and both alcohol wash and powdered sugar shake have increased in use.



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 key control decisions. Figures 15 below illustrates monthly sampling of the five methods.

### Monthly Monitoring of Tualatin Valley Beekeepers 2020-21

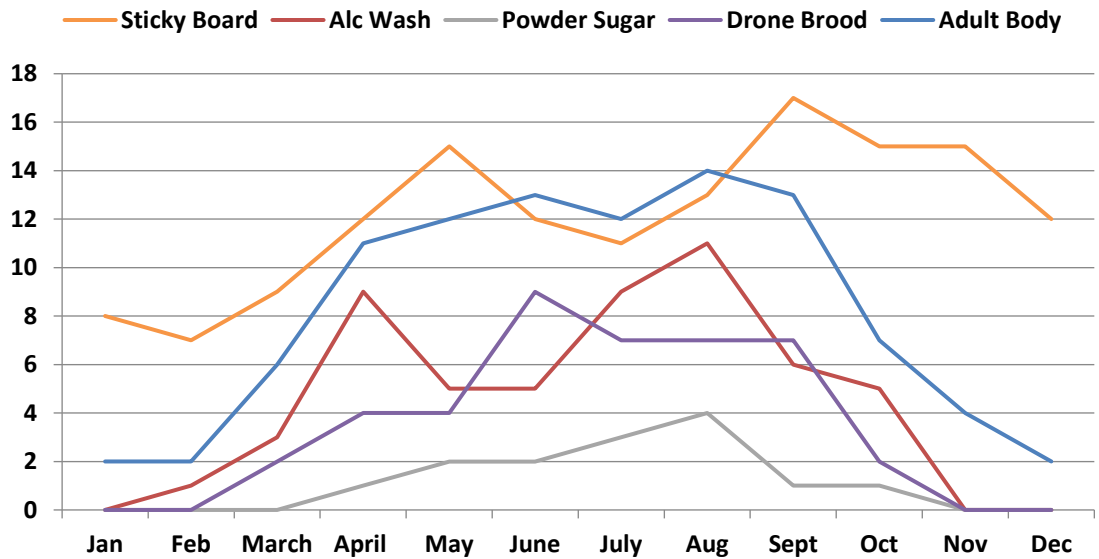
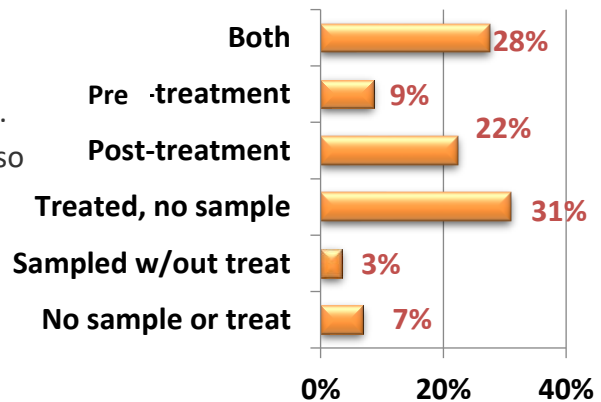


Figure 15

The most common sampling of respondents is both pre- and post-treatment (28% average last 5 years). 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 has been steadily increasing (31% this past year, more than double 5 years previous). Sampling data for last four years in Figure 16 right.

### ... and sampled ...



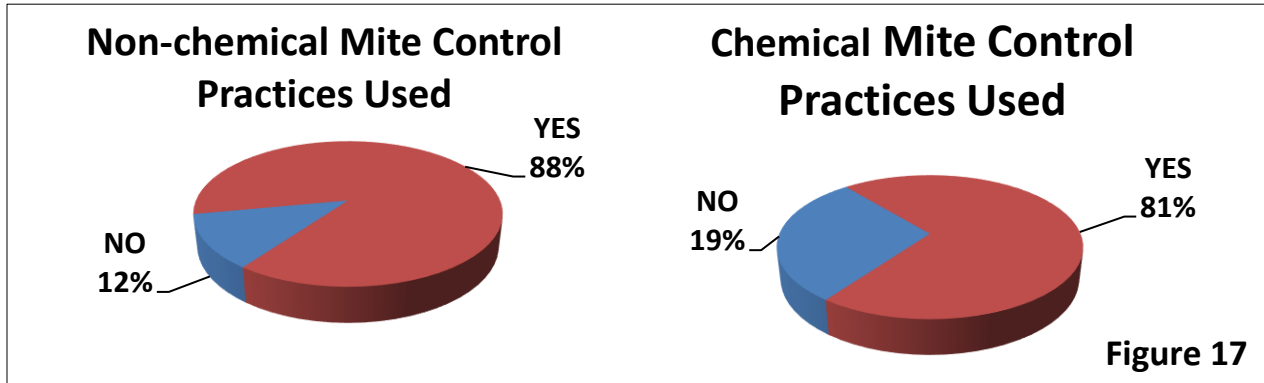
**It is important to KNOW mite numbers.** Less effective mite monitoring methods include sticky (detritus) boards below the colony. Often so much detritus drops onto a sticky board that counting the mites can be hard, especially for new beekeepers). Sticky boards used for a single day pre- and post-treatment 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 and the 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 on drone brood is also not effective as a predictive number but can be used as an early warning that mites are present; if done, look at what percentage of drone cells had mites.

See **Tools for Varroa Monitoring Guide** [www.honeybeehealthcoalition.org/varroa](http://www.honeybeehealthcoalition.org/varroa) on the Honey Bee Health Coalition website for a description of and to view videos demonstrating how best to do sugar shake or alcohol wash sampling. The Tools guide also includes suggested mite level to use to base control decisions based on the adult bee sampling. A colony is holding its own against mites if the mite sample is below 2%. It is critical to not allow mite levels to exceed 2-3% during the fall months when bees are rearing the fat fall bees that will overwinter. It is also the most difficult time to select a control method (if one is deemed needed) as potential treatment harm may negatively impact the colony. We are seeing more colonies suddenly disappear (abscond?) during the fall, which may be related to the treatment itself.

## Mite Control Treatments

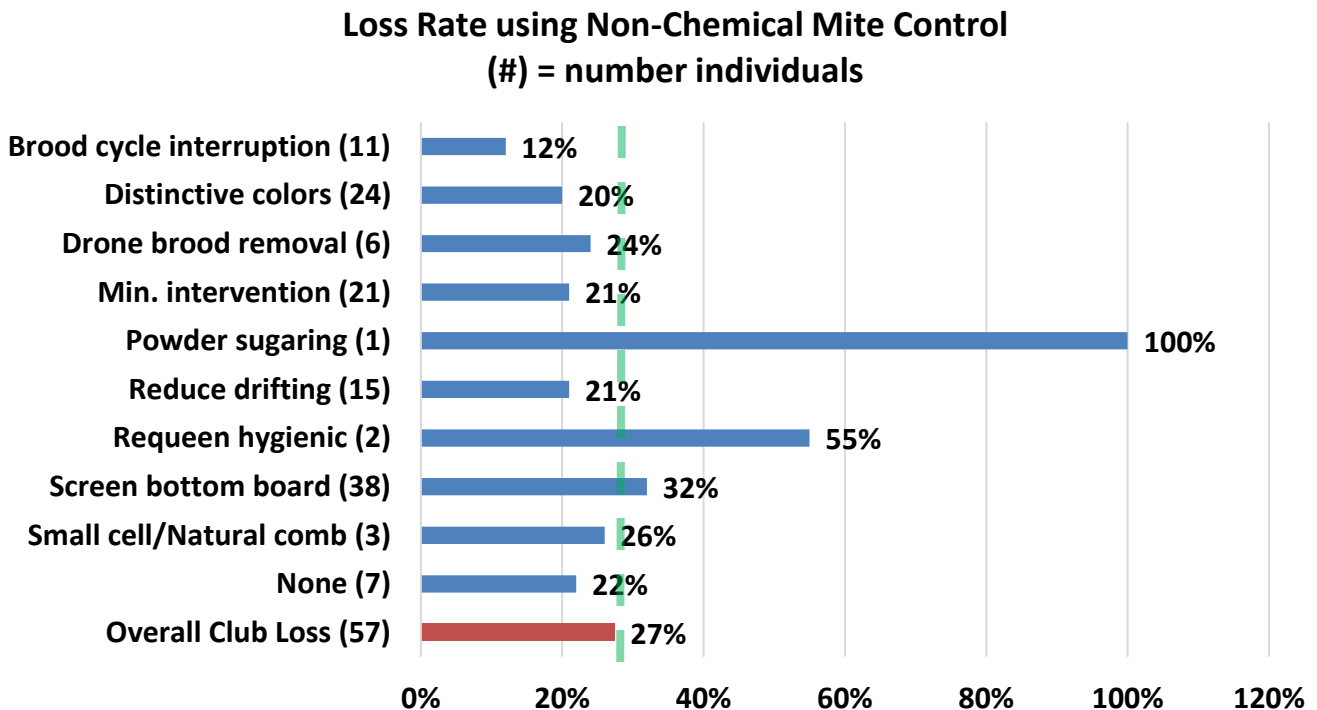
The survey asked about non-chemical mite treatments and also about use of chemicals for mite control. Seven individuals (12%), said they did not employ a non-chemical mite control and 62 individuals (19%), 1 percentage point fewer compared to last year, did not use a chemical control. See

Figure 20. Those 7 individuals who did not use a non-chemical treatment reported a 22% winter loss, 5 percentage points less than average TVBA loss while those who did not use a chemical control lost 61% of their colonies. The individual options chosen for non-chemical control are discussed below.



**Non-Chemical Mite Control:** Of nine non-chemical alternatives offered on the survey (+ other category,) 12 individuals (24%) used one method (33% loss), 17 used two (37.5% loss, the median number, 11 used three (19% loss), 5 used 4 (32% loss) and 4 used 5 to 7 (19% loss). There is no clear pattern of number of managements used and percent loss.

Figure 18

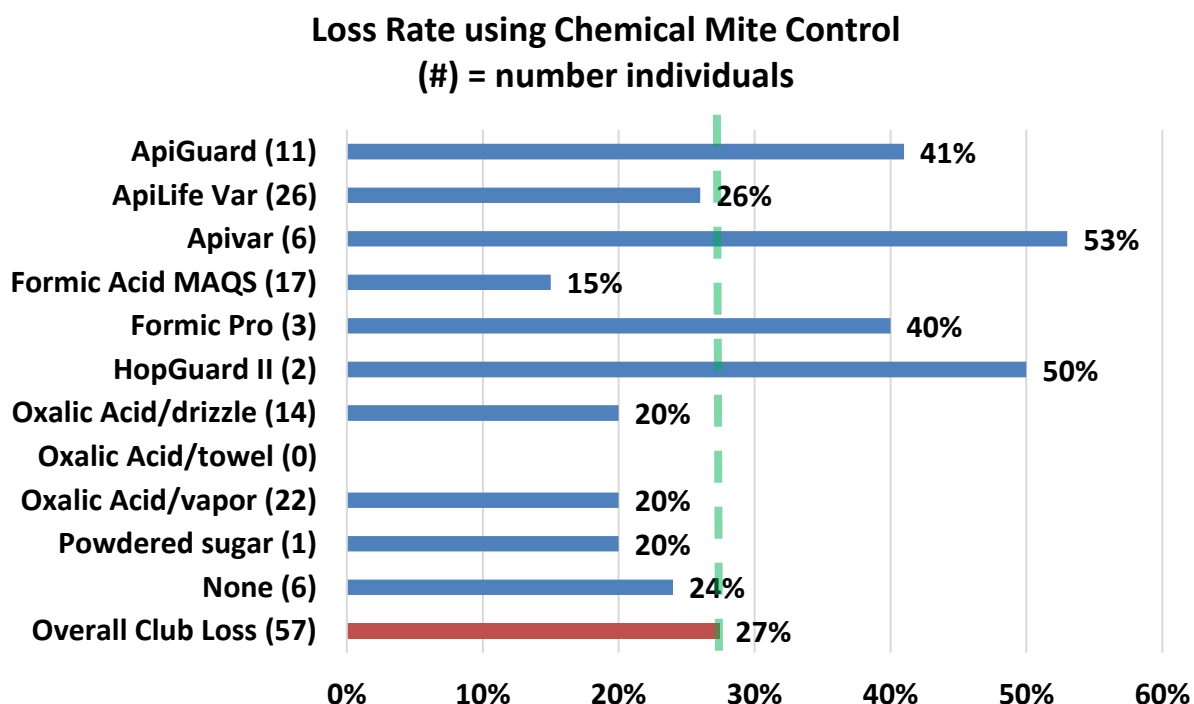


Use of screened bottom board was listed by 38 individuals (76% of total respondents). Their loss was 32%, 5 percentage points above average for TVBA. The remaining selections, with the exception of powder sugaring (a single individual) and requeening with hygienic queens (2 individuals) all improved survival. Brood cycle interruption (11 individuals ) showed the best survival (12%). The use of the selections are shown in Figure 20; number of individuals in ( ), bar length represents average loss level of those individuals using each method. Those left of **green dashed** line had improved survival.

Three of the non-chemical alternatives have demonstrated reduced losses over past 5 years. Reducing drifting such as spreading colonies (33% loss average for 3 years – question not asked in 2016-17 survey) and brood cycle break (36% average) have consistently year after year demonstrated somewhat better survival than average statewide loss (41%). Brood cycle break was the best management for improving survival for TVBA this past year. Different colony colors in apiary and drone brood removal were both 41%, 5-year average. Some non-chemical control alternatives demonstrate an advantage on one or two years but overall, no improvement.

**Chemical Control:** For mite chemical control, 6 individuals (11% of total respondents) used NO chemical treatment. They had a loss level of 24%. Those using chemicals used at rate of 2/individual. Seventeen individuals (33%) used one chemical (had 47% loss level), 21 used two (16% loss level), 11 used 3 (27% loss) and 3 used 4 (30%). Loss levels declined with heavier usage statewide but not this year for TVBA.

**Figure 19**



Twenty-six respondents (51%) indicated they used ApiLifeVar. This was 2/3rds of the total use statewide. It provided average survival for TVBA but an improvement of 7 percentage points over the statewide loss level. Oxalic acid vapor was used by 22 individuals (43%) and it gave a 7-percentage point improvement over average survival. Surprising so did the Oxalic acid drizzle (used by 14 individuals). Statewide OAV provided a 6-percentage point advantage (better survival) but the OAD users had average losses. Formic acid provided better survival for TVBA members (15% loss level) as it did statewide. Formic Pro in 3 seasons has provided an average of 15 percentage points better survival for beekeepers statewide but it did not do so for the 3 Formic Pro users of TVBA.

All three api's- Apivar, Apiguard, ApiLifeVar - once again showed very decent survival rates. However not for TVBA members this past season. ApiLifeVar was average formembers. Figure 19.

Consistently the last 5 years five different chemicals have helped beekeepers improve survival. The essential oils Apiguard (average 5-year loss level 31.6%), Apivar (32% average 5-year loss level), Oxalic acid vaporization (32.6% average loss level over last 5 years – in contrast the oxalic acid drizzle average of last 4 years is 40% loss level), ApiLifeVar (34.4% average loss level over last five years) and formic acid MAGS formulation 39.4% loss level the last 5 years. Average loss level has been 41% the last 5 years. Those who mix formic into shop towels have heavier losses while Formic Pro has increased survival.

The monthly use of Apivar (blue line), essential oil (red line) or an acid (green line) is shown in Figure 20. Further review is needed to determine if the timing of treatments was more effective than at other times for the various chemicals.

### Mite Control Products used by Tualatin Valley Beekeepers 2020-21

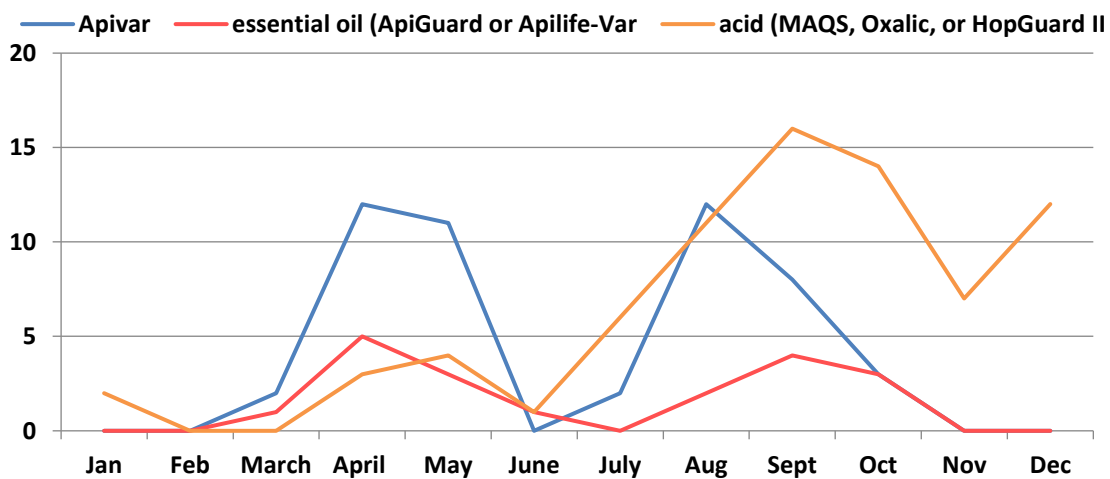


Figure 20



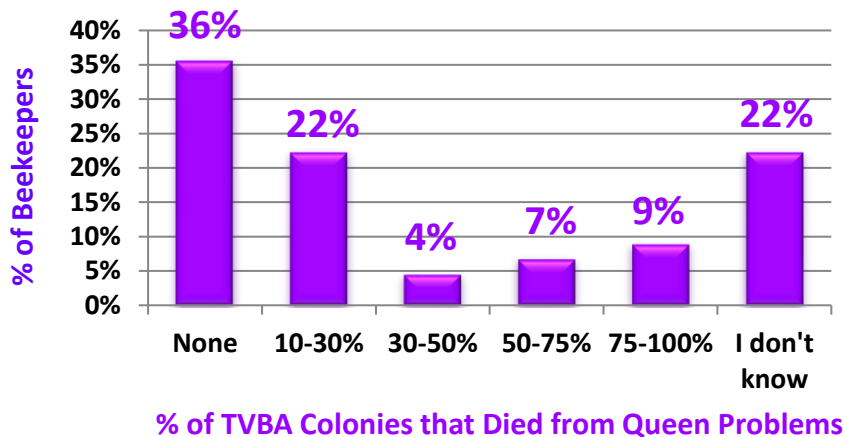
Figure 23

## Antibiotic use

Statewide seven individuals (2%) used Fumagillin (for Nosema control) and an equal number indicated use of terramycin; one was a TVBA member. The terramycin users had a 19% loss level and those who used fumagillin had a 26% loss. The TVBA terramycin user lost one of 5 colonies (20% loss)

## Queens

We hear lots of issues related to queen “problems”. Recall under the question asking the reasons why colonies didn’t survive 15 individuals, 45% of respondents with losses, noted queen failure as one of their selections (Figure 8). In Section 8 of the survey, we asked what percentage of loss could be attributed to queen problems. Nineteen individuals, 4 more than on earlier question, indicated queen problems 10 to 100% queen issues. Figure 21 shows that sixteen said none (36%); an additional 10 individuals (19%) said they didn’t know. The remainder did not answer this survey section.



Queen events can be a significant factor contributing to a colony not performing as expected. We asked if you had marked queens in your hives. Sixteen (28%), 4 percentage points fewer from last year, said yes. The related question then was ‘were your hives requeened in any form?’ to which 51% (29 individuals) said yes, 30% (17 individuals) said no and the remainder that responded (19%, 11 individuals) said ‘not that that I am aware of.’ If 2/3rds of the beekeepers are not marking their queens then how can they be sure their loss was due to queen problems?

One technique to reduce mite buildup in a colony is to requeen/break the brood cycle. The question “How did bees/you requeen” received 45 responses One-third of respondents indicated their bees were requeened with a mated queen, 1 used a virgin queen and 7 said via queen cells. Sixteen

percent (7 individuals said they split (divided) hives, and equal number said the bees superseded and one more individual (8) it their bees that requeened via swarming.

### **Closing comments**

This survey is designed to ‘ground truth’ the larger, national Bee Informed loss survey. Some similar information is additionally available on the BeeInformed website [www.beeinformed.org](http://www.beeinformed.org) and individuals are encouraged to examine that data base as well. Recall that the BeeInformed survey is measuring the larger scale OR beekeepers not the backyarders (See *American Bee Journal* April 2020 article by Dewey). Reports for individual bee groups are customized and posted to the PNW website.

We intend to continue to refine this instrument each season and hope you will join in response next April. If you would like a reminder when survey is open, please email us at [info@pnwhoneybeesurvey.com](mailto:info@pnwhoneybeesurvey.com) with “REMINDER” in the subject line. We have a blog on the [pnwhoneybeesurvey.com](http://pnwhoneybeesurvey.com) and will respond to any questions or concerns you might have.

**Thank You to all who participated.** If you find any of this information of value, please consider adding your voice to the survey in a subsequent season.

Dewey Caron July 2021