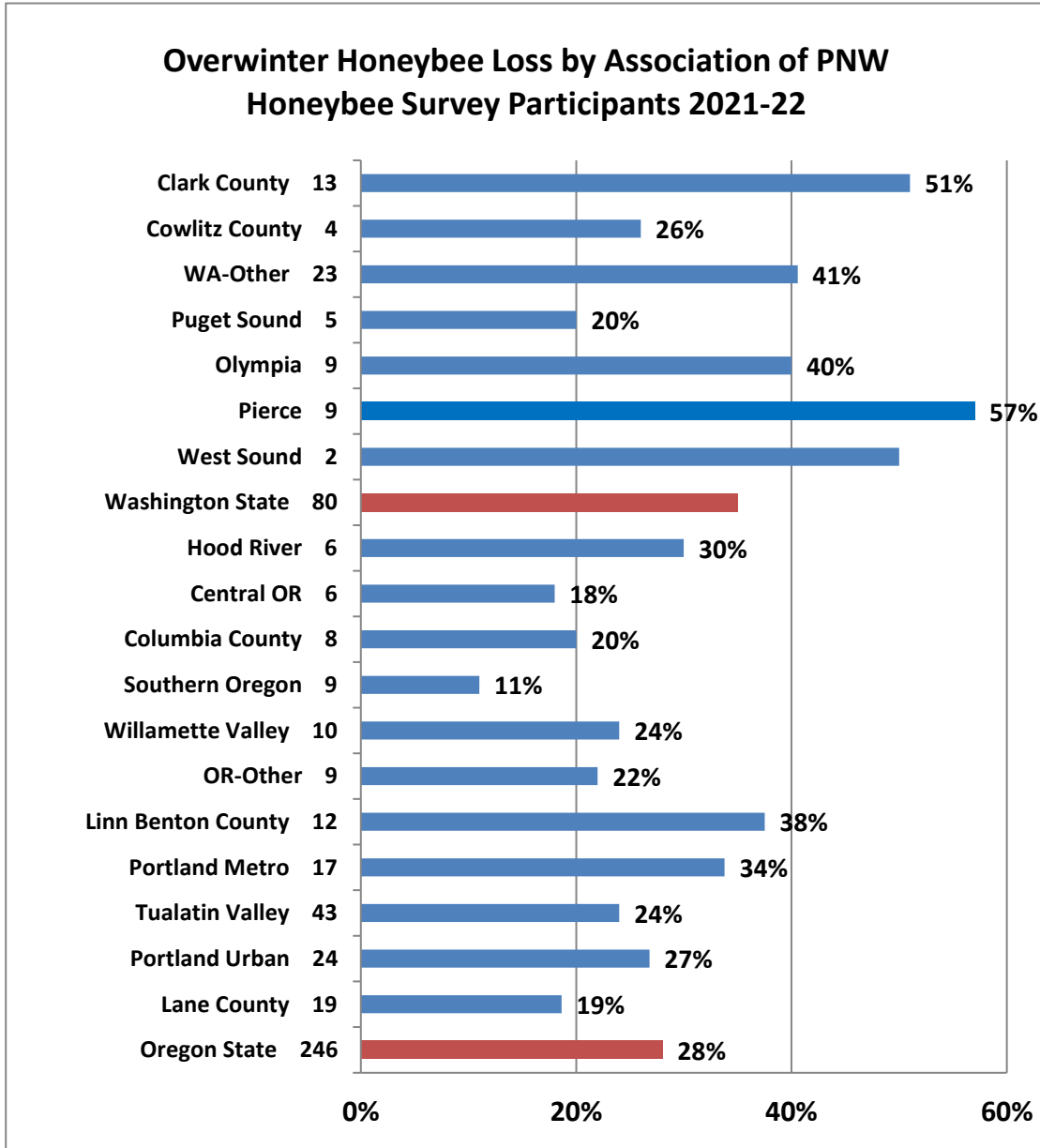


2021-2022 LBBA Winter Loss Report by Dewey M. Caron

Linn Benton 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 13th year of such survey activity. I received 246 responses from OR backyarders, keeping anywhere from 1 to 40 colonies; LBBA members sent in 12 surveys, 14 fewer than last year, reporting on 64 fall colonies.

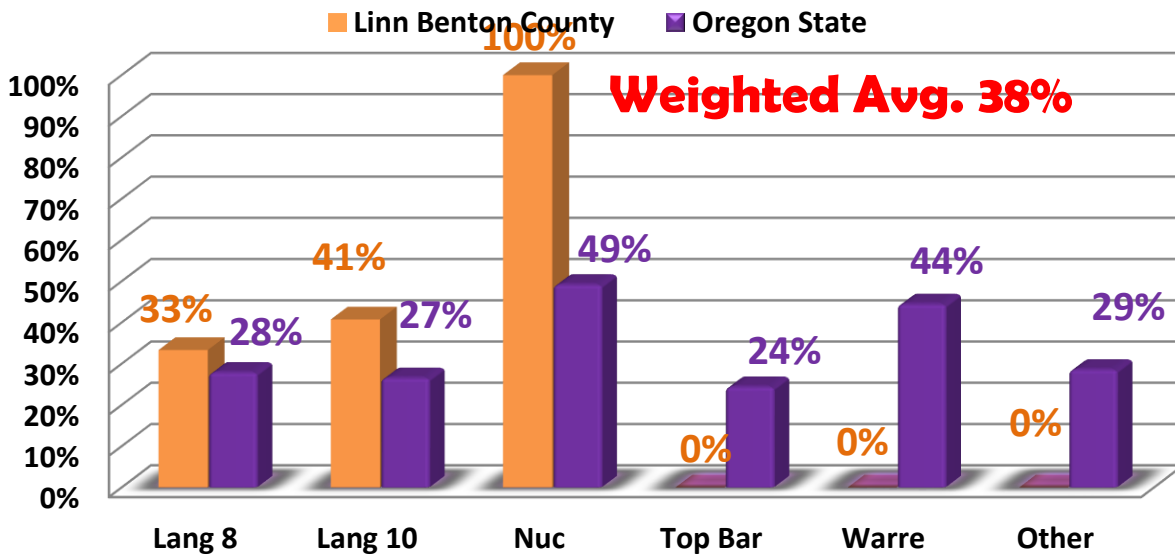


Linn Benton average losses = 38%, ten percentage points higher than statewide average and the highest of any of the Oregon clubs. Losses were 4 percentage points higher than the previous 2 winters.

Percent losses were determined by hive types were 33% Langstroth 8 and 41% for Langstroth 10 frames hives (8 year average statewide is 36% and 40% respectively). The three nucs did not survive but the single top bar hive did. The 3 other, all survivors, were double nucs. Figure 2.

Figure 2

Winter Honeybee Loss % by Hive Type, 2021-22

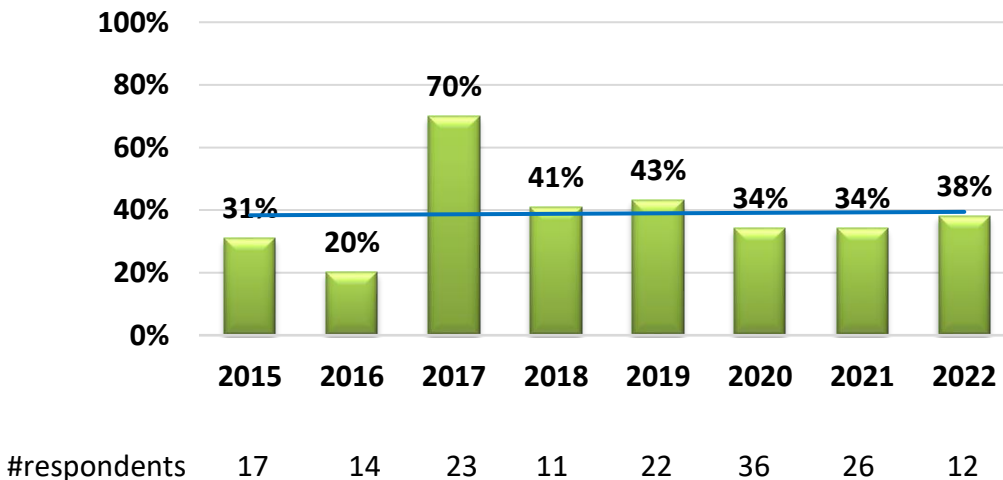


Fall	30	27	3	1	0	3
Spring	20	16	0	1	0	3

Overwintering losses of LCBA respondents = 38 %, 4 percentage points higher than last two years. Loss level was 1 percentage points lower than the 7-year average losses for Linn Benton beekeepers (Figure 3) The trend line in blue of losses is flat with the lower losses the last 2 years.

Figure 3

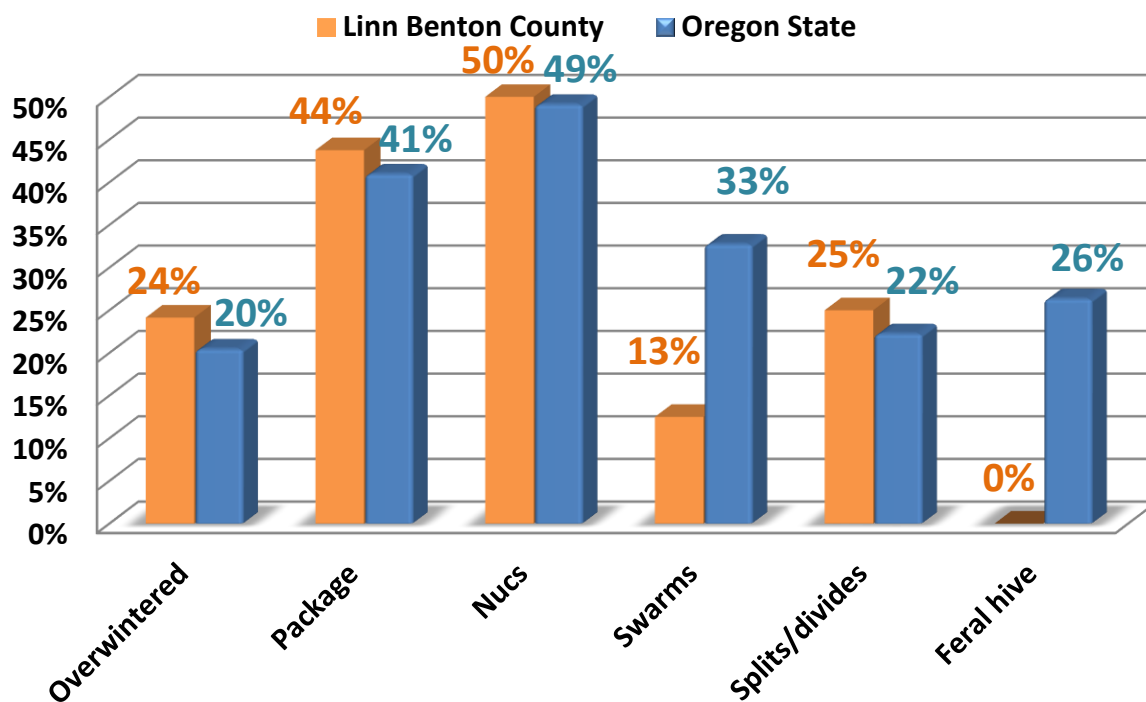
Linn Benton County Loss History



Loss level is the same as the average Oregon backyard beekeeper loss level (38%) of the past dozen years nearly double what commercial beekeepers experience (21%).

The survey also asked for hive loss by **hive origination**. Members reported 24% loss of previously overwintered colonies, 4 percentage points over the state-wide level. Package, nuc and split losses were similar to statewide levels while only one of 8 swarms failed to survive the winter. Figure 4 below.

Winter Honeybee Loss % by Origination, 2021-22



Fall	29	16	6	8	4	0
Spring	22	9	3	7	3	0

With small number of respondents the LCBA respondents had a strange distribution of colony ownership. Statewide 51% of survey respondents had 1 to 3 colonies. For LCBA, none had a single colony, four (25%) had 2 or 3 colonies (22% loss), six individuals had 4 6 or 8 colonies (30% loss) and 2 had 10+ colonies (48%). Fifteen was highest number. Statewide as colony numbers increased, the loss rate decreased, opposite of the 12 OBBA members.

Four individuals had no loss (11 colonies total). One individual had total loss (2 colonies). Four individuals lost one colony, one lost 2 colonies and 2 lost 3 with one losing 12.

Four LB respondents (33%) had 2 or 3 years of beekeeping experience; they had 20% loss level. The four that had 5, 6 or 8 years experience, had 50% loss. Four had 10+ years with 28% loss level. Highest was 15 years. Statewide as years experience increase the loss level decreases but only slightly.

Tow members had 2 apiaries and 3 moved colonies in year.

Reasons for Loss/Acceptable loss

The survey asked individuals that had colony loss to estimate what the likely reason(s) might have been, Multiple responses were permitted. There were 11 listings. Do not know was most popular choice (3 individuals), 2 each listed poor wintering and varroa mites and these was a single listing for weak, starvation and repeated swarming.

Survey individuals are asked to indicate what might be an acceptable loss level. Four individuals listed none. The median (middle) selection was 10% (3 individuals), 1 listed 15%, 3 indicated 20% (the statewide medium) and one said 25%.

Why do colonies die? There is no straightforward way to verify reason(s) for colony loss. Colonies in the same apiary may die for distinct 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. LBBA individual choices varied from zero to 25%. Statewide acceptable loss level has crept upwards over time.

Major factors in colony loss are thought to be mites and their enhancement of viruses especially DWV (deformed wing virus), plus declining nutritional adequacy/forage and diseases. Pesticide in the agricultural environment weakens colonies. Yellow jacket predation is a constant challenge 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 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 LBBA and OR beekeepers often do not do just one thing/management to their colony (ies) to control mites to improve overwintering success.

With respondent number low, check out the 21-22 statewide management details or details from last years report.

FEEDING: Linn Benton survey respondents checked 39 feeding options = 3.3/individual. Four individuals said they fed frames of honey , 11 of 12 fed sugar syrup as did 11 feed pollen patties. Two fed frames of pollen and one dry pollen. Five individuals provided hard candy and 4 dry sugar while one fed fondant sugar.

WINTERING PRACTICES: One Linn Benton individual reported doing no winterizing; they lost one of four colonies. Multiple selections were possible; Linn Benton member checked 24 winter management options, average 2.2/individual. Two indicated they equalized hive strength, two used an insulated top one less than the 3 who used upper entrance. Three respondents said they used a rain shelter, 2 wind weather protection and one said they wrapped.

SANITATION PRACTICES: It is critical that we practice some basic bee sanitation (some prefer use of term bee biosecurity) in our bee care toward insuring healthy bees. Linn Benton beekeepers had 27 responses 2.5/individual to sanitation management questions (8 had 1 to 3 and one indicated 4 options). Forty-one statewide individual including one WV individual said they did not practice any of the 6 offered alternatives. Loss rate statewide was 31% Slightly higher than average level) and for the single LBBA members 50.

Numbers of actions were similar for LBBA members. Five said they did minimal intervention, and five said they painted hive colors to make them distinctive and finally five said they cleaned the hive tool and washed clothing frequently. Four did measures to reduce drifting and there said they did other ID measures to make hives distinctive and avoided moving frames. The sanitation measures did not make a wonderful difference in hive survival statewide with only making hives distinctive seeming to result in consistently lower losses.

Screen Bottom Boards (SBB)

Although many beekeepers use SBB to control varroa, BIP and PNW surveys clearly point out they are not a remarkably effective varroa mite control tool. This past overwintering season, the 38 non-SBB users (2 were LBBA members) had winter losses of 103 of 27% loss. The 47 beekeepers (8 LBBA members) using SBB on all or some of their colonies had 29% loss. Examining the seven-year average of SBB use, loss level of the 83%

using SBB on all or some of their colonies had a 34.7% loss level whereas the 17% not using SBB had loss rate of 38%, a 3.3-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, 66%, 163 individuals (7 members of LBBA), said they always blocked SBB during winter; 38 individuals statewide said they blocked some of the SBBs. Statewide those who blocked always or sometimes had 704 colonies in the fall and lost 273, a 39% loss rate. Figure 14 shows that those who never blocked had a 42% winter loss, a 3-percentage point difference. As in past years there was a slight advantage **in favor of closing the SBB over the winter period to improve survival.**

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

Mite Monitoring/Sampling and Control Management

We asked percentage of Oregon hives monitored for mites during the 2021 year and/or overwinter 2021-22, 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. Among LBBA members, 10 of 12 individuals (65%) monitored all colonies, one monitored some colonies and one none (they lost 1 of 4 colonies). Statewide the table below illustrates last 6 years of results. The mid 60% monitoring all hives had a 39% 6-year average loss while the 20%ish not monitoring had a 47% loss rate. Monitoring helps.

	ALL Colonies Monitored % individuals	% loss	SOME Colonies Monitored % individuals	% loss	No colonies Monitored % individuals	% loss
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%
6 year loss ave		39%		36%		47%

In order of popularity of use, alcohol monitoring was used by 9 individuals, sticky boards by 4, none used powdered sugaring. Four said they monitored drone brood and 3 said they looked at adults for mites. More than a single answer was permitted. Most sampling to monitor mites was done in July – September, as might be expected, since mite numbers change most quickly during these months and results of sampling can most readily be used for control decisions.

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 mites can be hard, especially for new beekeepers. Sticky boards can help confirm the usefulness of a treatment when inserted post treatment. Visual sampling is not accurate as most mites are not on the adult bees. They are in the brood. Unfortunately looking for mites on drone brood is also not effective as a predictive number but can be used as an early warning that mites are present; if done, look at what percentage of drone cells had mites. It is obvious that monitoring alone is a means towards improved winter survival.

See ***Tools for Varroa Monitoring Guide*** www.honeybeehealthcoalition.org/varroa on the Honey Bee Health Coalition website for a description of and to view videos demonstrating how best to do sugar shake or alcohol wash sampling. The Tools guide also includes suggested mite level to use to base control decisions based on the adult bee sampling. A colony is holding its own against mites if the mite sample is below 2%. It is critical to not allow mite levels to exceed 2-3% 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 either high mite numbers or sometimes to the treatment itself.

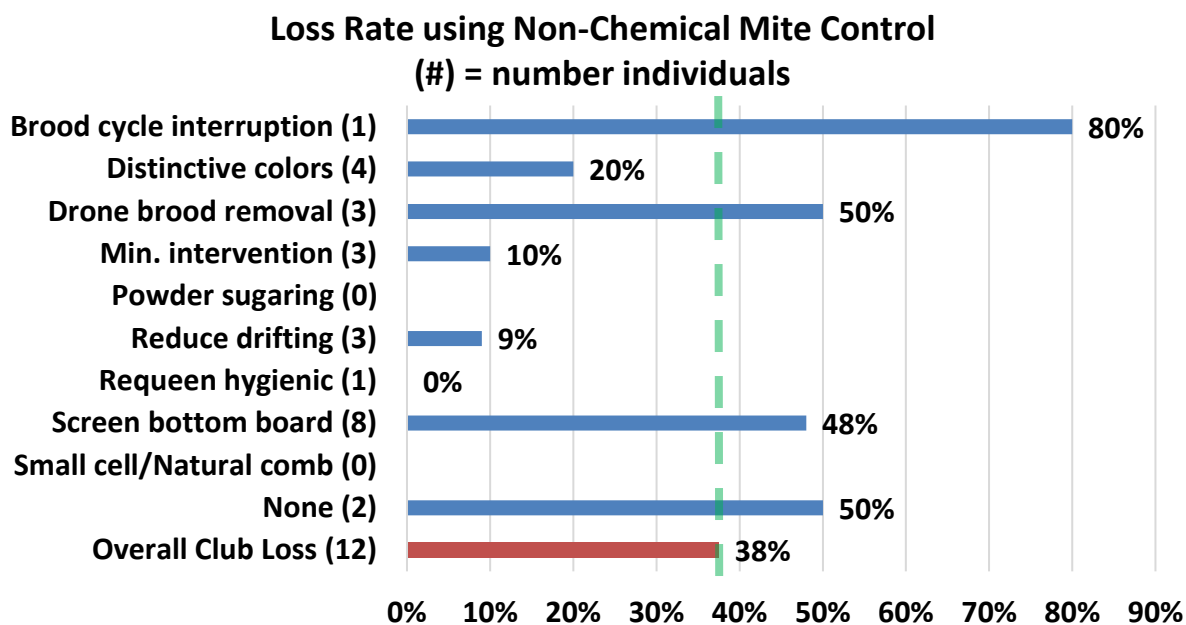
Mite Control Treatments

The survey asked about non-chemical mite treatments and also about use of chemicals for mite control. two LBBA individuals (8% compared to 14% statewide) said they did not employ a non-chemical mite control and 6 LBBA individuals (23%, compared to 19% statewide), did not use a chemical control. Those LBBA individuals who did not use a non-chemical treatment had a 100% loss; last year 6 LB individuals doing none had 81% loss). Statewide the 2 LB members were among the 45 individuals doing one; loss level was 48 statewide, 13 percentage points higher than average loss. The 6 LBBA members not using a chemical control had a loss rate of 92%; statewide lost rate=61% of colonies for individuals using no chemical treatment.

NON-CHEMICAL CONTROL: Of nine non-chemical alternatives offered on the survey (+ other

category) 2 individuals selected none – they had 50% loss. Ten individuals selected 23 choices or 2.3/individual. One used one method (50% loss) and one 4 methods (0 loss).

Use of screened bottom board was indicated by 80% but losses were quite high (48%). All other managements improved survival except for the 1 individual using drone removal and 3 seeking brood break.. Small club numbers can swing wildly one year to the next. See Figure below.



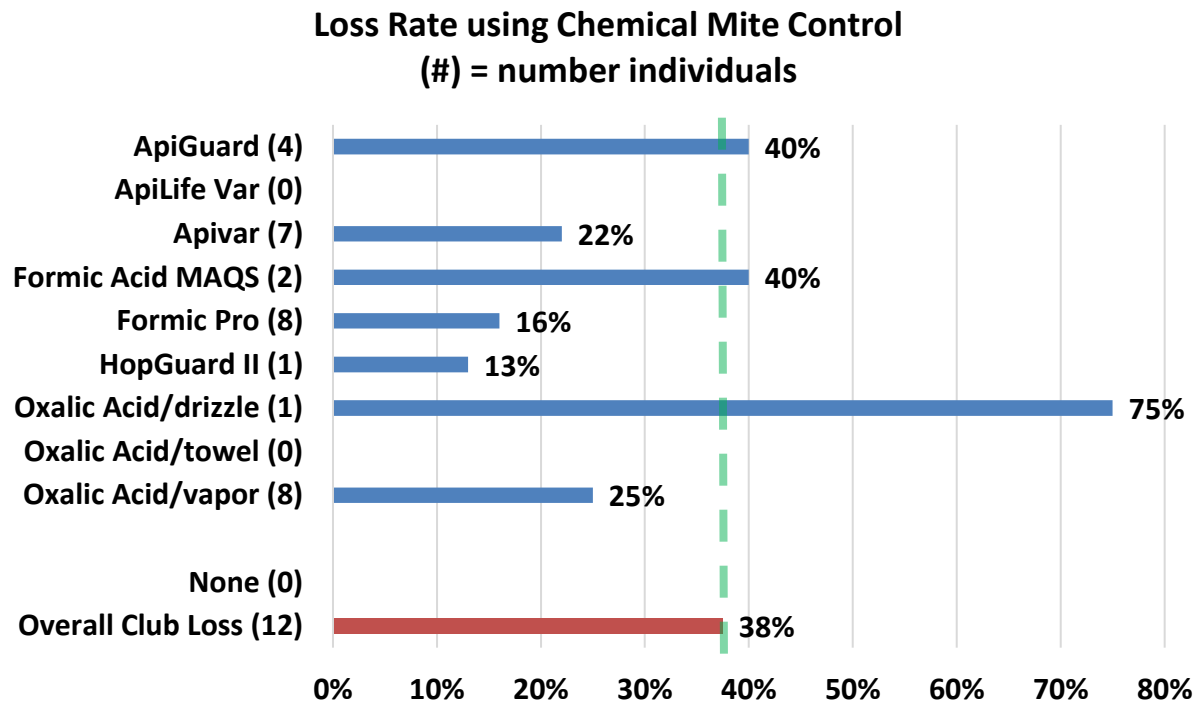
Three of the non-chemical alternatives have demonstrated reduced losses over past 6 years statewide. Reducing drifting such as spreading colonies (31% loss average for 4 years – question not asked in 2016-17 survey) and brood cycle break (34.5% average) have consistently year after year demonstrated somewhat better survival than average loss (37% average loss last 4 years and 39% loss last 6 years respectively 37%). Different colony colors in apiary 37.7% average loss and drone brood removal (38.7% average loss) were just slightly better than average 6-year loss (39%). Some non-chemical control alternatives demonstrate an advantage on one or two years (such as small cell/natural comb this past season) but overall show no improvement.

Chemical Control: For mite chemical control, all Linn Benton respondents used a chemical treatment. Those using chemicals did so at rate of 2.7/individual (same as statewide). 3 LB members using one chemical (Formic Pro) had a 14% loss rate; the 2 using 4 chemicals had an 8% loss.

Formic pro was used by 8 of 12 LB members. They had loss of 16%. Oxalic acid vapor was also used by 8 members; they had loss rate of 25%. Seven individuals used Apivar – they had a 22% loss rate.

Consistently the last 5 years five different chemicals have helped beekeepers improve survival. The essential oils Apiguard (average 6-year loss level 30.5%), Apivar (31.2% average 6-year loss level), Oxalic acid

vaporization (31.3% average loss level over last 6 years – in contrast the oxalic acid drizzle average of last 5 years is 37.8% loss level which is 0.4 percentage points above the 5-year average of 37.4%), ApiLifeVar (34.4% average loss level over last six years) and formic acid MAGS formulation 39.4% loss level the last 6 years. Average loss level has been 39.2% the last 6 years. The formic acid extended OAE absorbing oxalic acid and glycerin into sponges had slightly better than average loss but this has not been the case in previous years. Formic Pro has steadily increased in use – it looks very promising at a 25.3% loss level the past three years (when average loss was 36.5%).



Queens

We hear lots of issues related to queen “problems”. Five LBBA individuals said they did not have any queen issues and 4 said they did not know. Two individuals checked 1 to 10% queen issues and another said 10-30% queen issue

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. Four individuals said yes (33%) and the remainder (67%) said no. Statewide ninety individuals (37%) said yes. The related question then was did you or your bees replace their colony queen? Eight (67%) said Yes, 2 did not know and 2 said no. Response mirrors statewide - 56% said yes, 24% said no.

One technique to reduce mite buildup in a colony is to requeen/break the brood cycle. Responses to the question “How did bees/you requeen” included one individual who used a mated queen, 1 who captured a

feral colony, one let colly requeen and in another instance split hive to make nuc then reunited nuc back to original colony (after original queen was eliminated), 2 split colonies, 5 swarmed (multiple answers could be given).

Closing Comments

This survey is designed to 'ground truth' the larger, national Bee Informed loss survey. Some similar information is additionally available on the BeelInformed website www.beeinformed.org and individuals are encouraged to examine that data base as well. Recall that the BeelInformed survey is measuring the larger scale OR beekeepers not the backyarders (figure 6 of OR state loss report.) 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 with "REMINDER" in the subject line. We have a blog on the pnwhoneybeesurvey.com and will respond to any questions or concerns you might have.

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

Dewey Caron July 2022