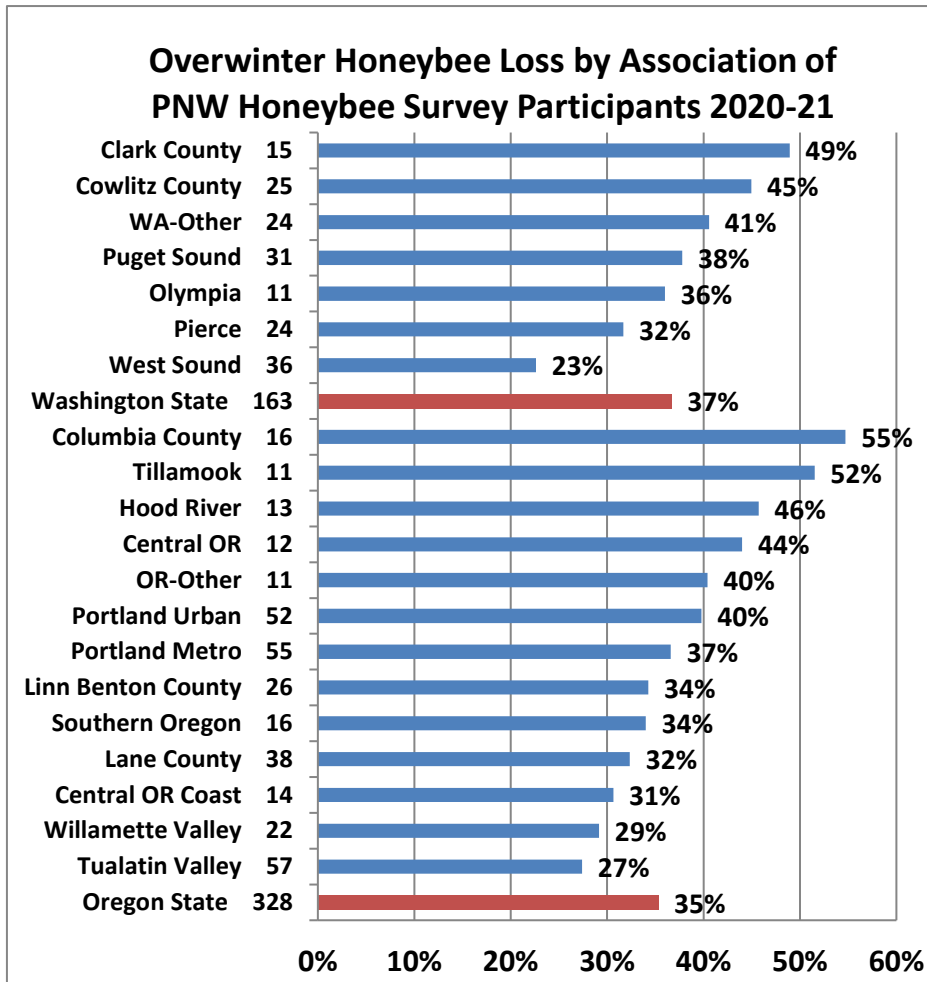


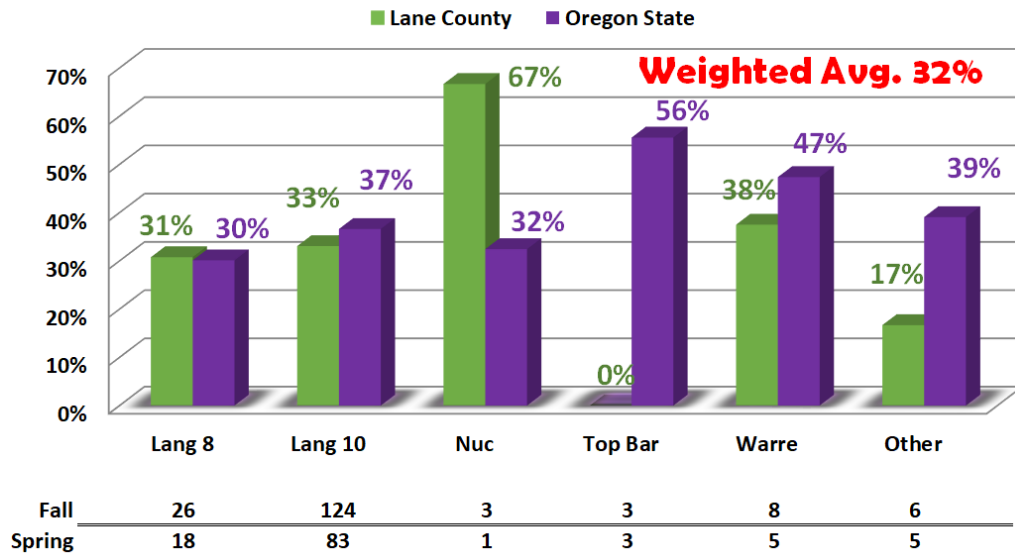
2020-2021 LCBA Winter Loss Report by Dewey M. Caron

Lane 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 12th year of such survey activity. I received 328 responses from OR backyarders, keeping anywhere from 1 to 40 colonies; LCBA members sent in 38 surveys, 17 fewer than last year, reporting on 176 fall colonies.

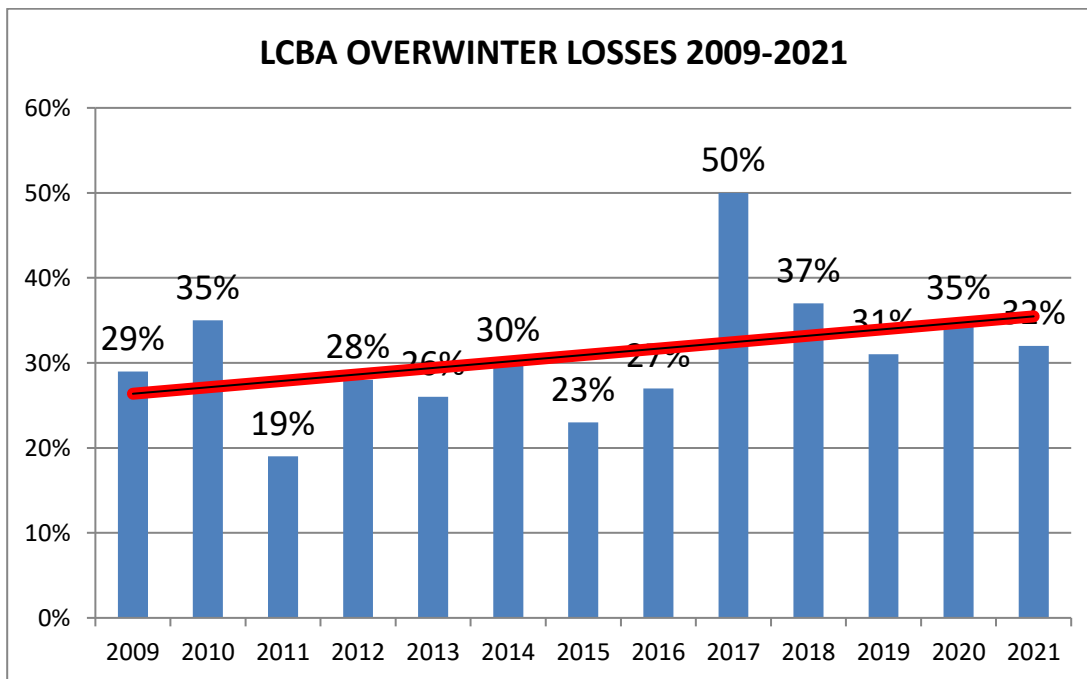


Overwintering losses of LCBA respondents = 32 %, an improvement of three percentage points from 35% average Oregon losses last year. Loss level was one percentage point higher than the 13- year average losses of Lane beekeepers. The trend line of losses however is an increasing one. Percent losses, determined by hive types were 31% Langstroth 8 and 33% for Langstroth 10 frames hives (26 and 124 fall colonies respectively). Nuc losses were 2 of 3 fall colonies =67%. Of three Top bar hives none were lost. Two of 8 Warre hives were lost (38%) and the one “other,” a valkyrie (horizontal) hive, did not survive.

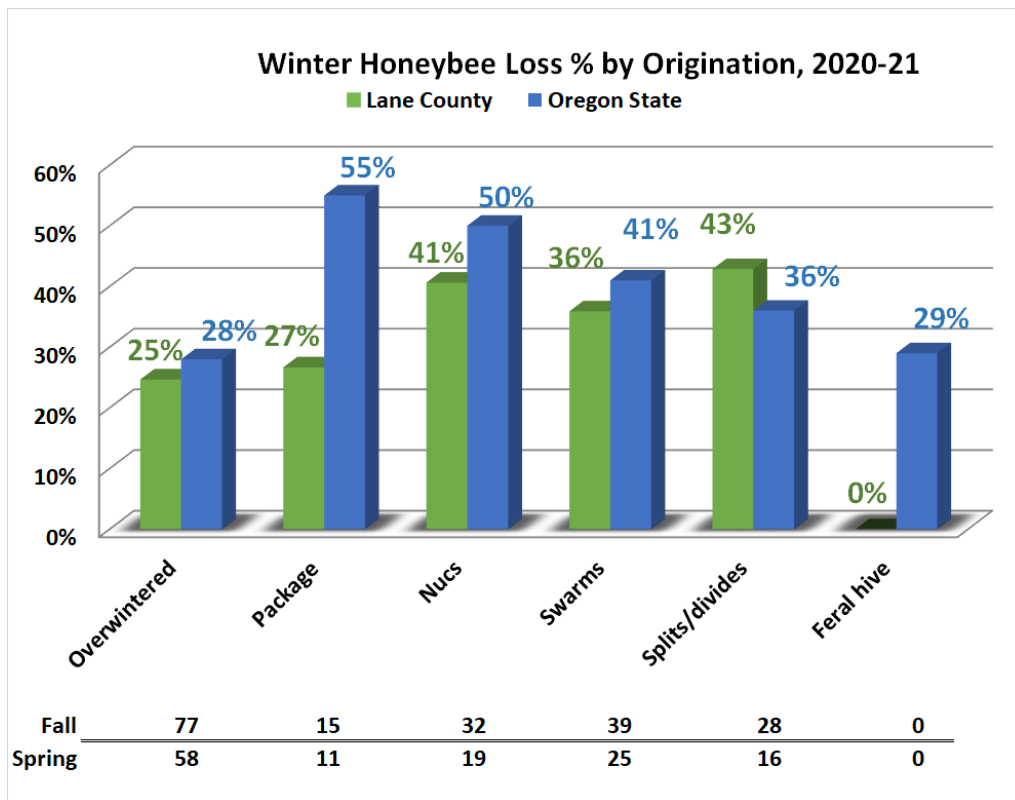
Winter Honeybee Loss % by Hive Type, 2020-21



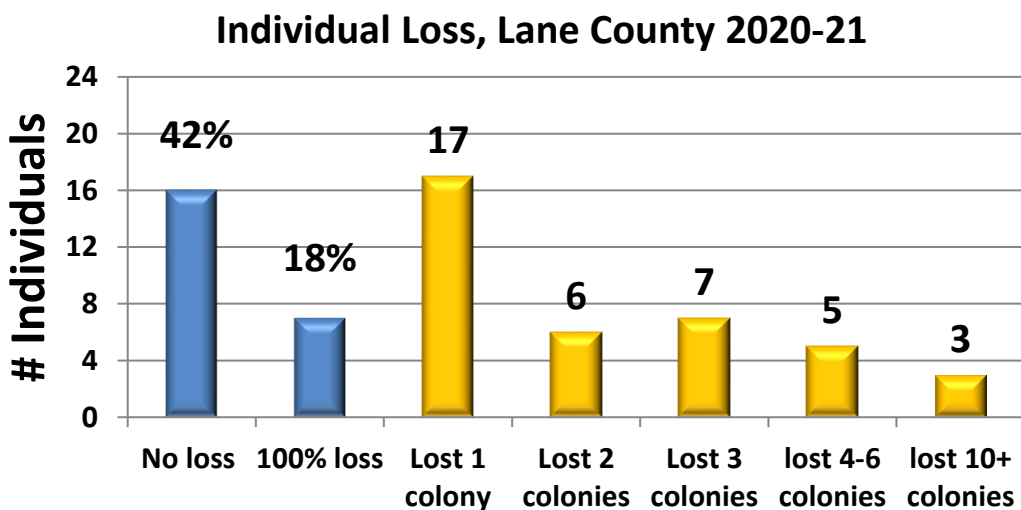
The attached figure shows LCBA losses for past 13 years. Solid line is loss trend. Average for last 13 years is 31%.



The survey also asked for hive loss by **hive origination**. Members reported 25% loss of previously overwintered colonies, a loss of 27% packages (16 total), while nuc (41% - 32 total), swarm (36% - 39 total) and split (43% - 28) losses were intermediate. The graph compares LCBA losses compared to Oregon statewide numbers.



Not everyone had loss. In fact, 16 members reported NO LOSS (42% of survey respondents) while 7 respondents (18%) reported total winter loss of colonies. Heaviest loss was. Heaviest loss number was 1 colony (17 individuals). 3 individuals lost 8 or more colonies – heaviest loss was 11 colonies.



Typical of the statewide data, the LCBA respondents are largely new beekeepers. 63% of LCBA respondents had 1 to 3 fall colonies, another 21% had 4 to 6 colonies while 6 respondents (16%) had 9+

colonies – maximum number for any respondent was 26 colonies. In terms of years experience 7 individuals had 1 to 3 years experience (19% loss) 13 had 4-6 years experience (27% loss) 9 individuals had 7-9 years experience and had heavy loss of 66% while 9 individuals had 10+ years experience with 28% loss level. Greatest years of beekeeping=62,

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. Eleven individuals (50%) of those having losses said varroa, 8 said weak (36%), 7 said Don't know, 6 indicated queens. Four said poor overwintering and 2 said yellow jackets. The median level of acceptable loss was 20%; Three individuals (8%) indicated the actual level of LCBA loss of 33%.

Acceptable Overwinter Loss per 38 Beekeepers in Lane County during 2020-21												
Loss level	5%	10%	15%	20%	25%	33%	50%	75%	100%	None	Other	
#	3	3	4	7	7	3	3	1	0	4	3	
%	8%	8%	11%	18%	18%	8%	8%	3%	0%	11%	8%	

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

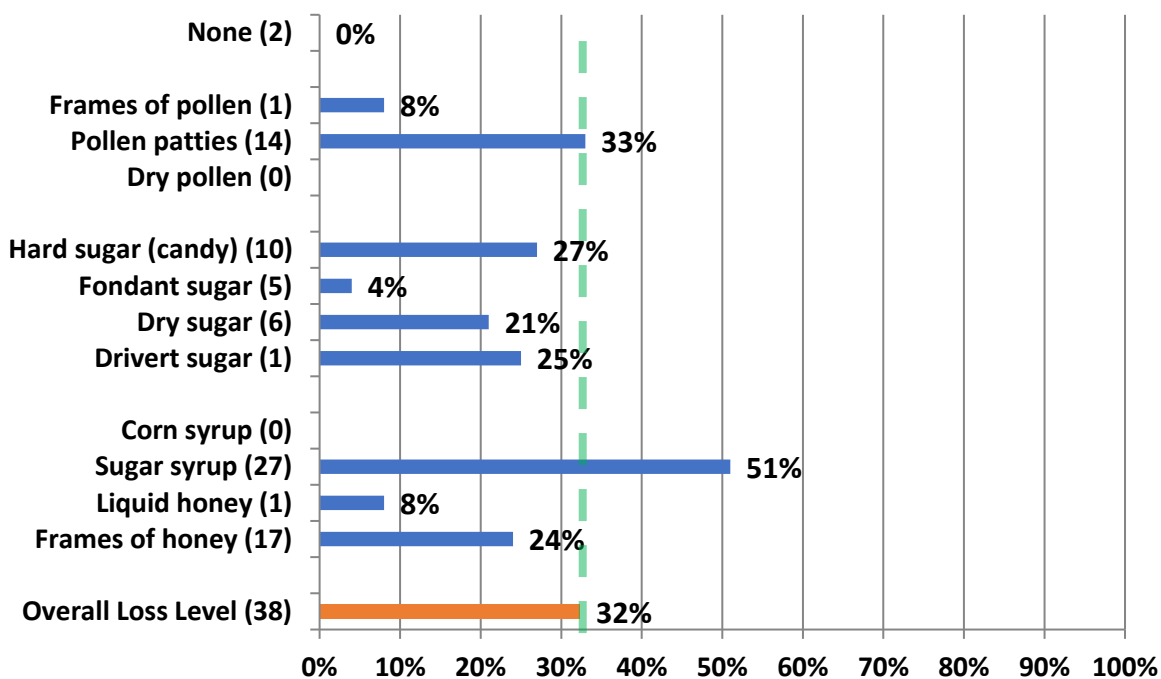
We asked in the survey for information about some managements practiced by respondents. The survey inquired about feeding practices, wintering preparations, sanitation measures utilized, screen bottom board usage, mite monitoring, both non-chemical and chemical mite control techniques and queens. Respondents could select multiple options and there was always a none and other selection possible. This analysis seeks to compare responses of this past season to previous survey years.

Most Oregon beekeepers do not perform just one management to their colony (ies) toward improving colony health and overwintering success. This analysis however is mainly of a single factor equated with loss level of those same individuals. Such analysis is correlative - doing a similar management as fellow beekeepers does not necessarily mean you too will improve success.

FEEDING: Oregon survey respondents checked 913 feeding options = 2.9/individual. Forty-three individuals (14%), other than those who indicated no feeding, selected a single choice and had 32% loss, 79 (25% of respondents) indicated 2 choices (34%, loss), 95 (the greatest number and medium) indicated 3 choices (they had 33% loss); 63 individuals (20%) had 4 choices with 9% loss, 23 had 5 choices (8% loss). The remainder had 6 with one making 8 selections for feeding management.

The choices, with number of LCBA individuals making that selection is in () in Figure 10; bar length indicates loss level of individuals doing this management. Those bar lengths to left of 35% **green dashed** marker had better survival while those to right had greater loss level.

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



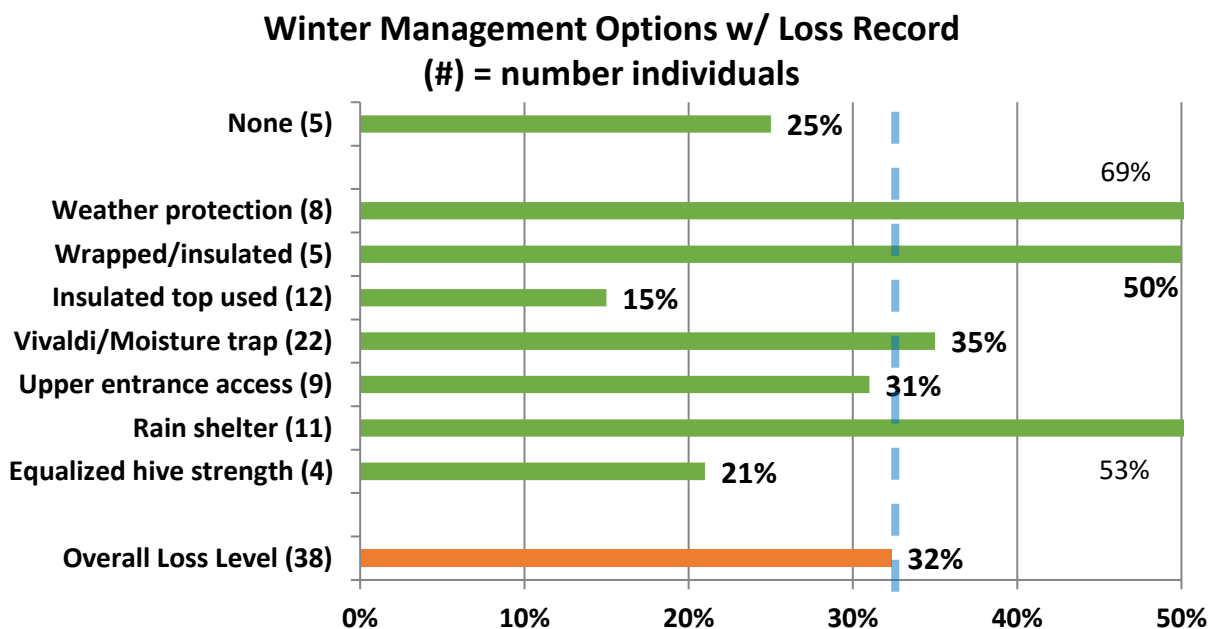
Statewide for the last 5 years individuals doing no feeding had 6 percentage point higher losses (average 47%) i.e. poorer survival, compared to average loss rate of 41%. Average percent doing no feeding = 8% of individuals). For LCBA 2 individuals of 38 did not feeding – they had 0 loss

Individuals statewide that fed sugar syrup also had a 6-percentage point lower loss level (average for the 5 years). Those feeding honey (as frames or liquid) had lower loss only during 2 of the past 5 years.

Individuals feeding non-liquid sugar (in any of the forms) had lower losses four of five past winter seasons (this was the year where it was not better), with 5 or 6 percentage point improvement from overall losses. Dry sugar feeders had slightly better survival all 5 winters while hard candy feeders had a much-improved survival 4 of 5 past winters ; fondant feeders had better survival 3 of the 5.

For individuals feeding protein, only the protein patty users showed better survival all 5 years; dry pollen feeders had much better survival in two of the past five years with losses the remaining three years, including the past one, close to the overall yearly average.

WINTERING PRACTICES: We received 2.2/individual selections of LCBA beekeeper wintering management practices (more than one option could be chosen). Five LCBA individuals (13%) of the respondents indicated doing none of the several listed wintering practices; these individuals had a 25% winter loss, Statewide 13% of respondents selected none and they had 4 percentage points higher loss than overall loss of 35%. For those indicating some managements, 11 individuals (30% loss) did one single thing, 11 did 2, the medium, (36% loss), 6 did three (30% loss), 5 did 4 or 5 had 43% loss).



Over the past four years individuals that did no winterizing practice (average 13.4% of individuals) averaged 46% loss compared to 42% overall average loss, 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). 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. Average loss rate for last 4 years was 42%.

SANITATION PRACTICES: Sanitation appears to be relatively minor toward improving survival. Statewide avoiding moving frames and reducing drifting were the two sanitation choices that demonstrated better average survival 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%.

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. Average non-use for last several years is 17%, vs 83% use, on some or all colonies over the 7-year period. 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. Those who never blocked had a 38% winter loss, a 3-percentage point greater loss: it appears there is a slight advantage in favor of closing the SBB over the winter period to improve survival.

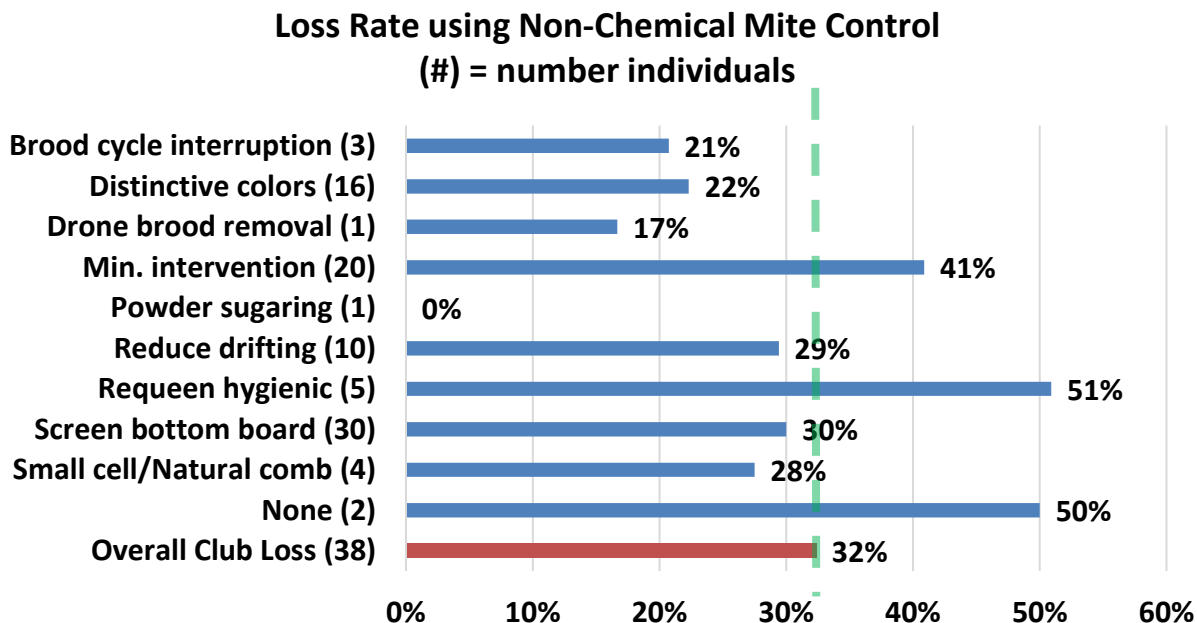
It is important to KNOW mite numbers. Less effective mite monitoring methods include sticky (detritus) boards below the colony. Often so much detritus drops onto a sticky board that counting the mites can be hard, especially for new beekeepers). Sticky boards used for a single day pre- and post-treatment 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 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. Two LCBA individuals (5%, one less than last year) said they did not employ a non-chemical mite control and 6 LCBA (16%), 5 fewer but only 2 percentage points difference than last year, did not use a chemical control. Those 2 individuals who did not use a non-chemical treatment reported a 50% winter loss, while those who did not use a chemical control lost 64% of their colonies (essentially same as last year when it was 50 and 61 percent loss respectively. 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,) 8 LCBA individuals (22%) used one method and had a 21% loss, 12 individuals used two (53% loss rate), 11 used three (39% loss rate) and 6 individuals did 4, 5 or 6 had had a 14% loss. Clearly using one method with proper timing or using more than one tool improves success.

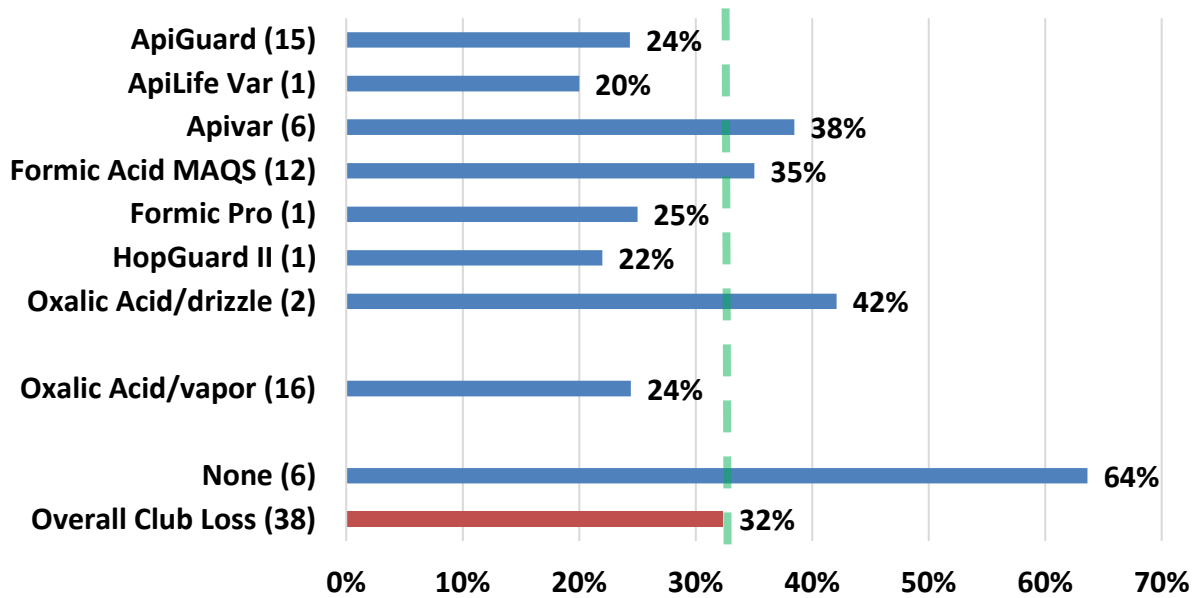


Statewide the non-chemical alternatives that have demonstrated reduced losses over past 5 years. include reducing drifting such as spreading colonies (33% loss average for 3 years – question not asked in 2016-17 survey) and brood cycle break (36% average) - average loss (41%). Different colony colors in apiary and drone brood removal (only a single individual of 38 LCBA survey respondents indicated using this technique this past year) were both 41%, the 5-year average. Some non-chemical control alternatives demonstrate an advantage on one or two years (such as drone brood removal this past season) but overall average did not show improvement and generally uses of some of these, outside SBB and minimum intervention, have been pretty low.

Chemical Control: For mite chemical control, 6 individuals (16% of total respondents) used NO chemical treatment. They had a loss level of 64%. Those using chemicals used at rate of 1.7/individual. Fifteen LCBA individuals (47% of total respondents using a chemical) used one chemical (had 36% loss level), 13 individuals used two (21% loss level), 3 used 3 (17% loss) and 1 used 4 (individual had 33% loss level).

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 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. Formic Pro has increased in use – it looks very promising at a 25.3% loss level the past three years (when average loss was 40.3%).

Loss Rate using Chemical Mite Control (#) = number individuals



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 (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 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 September 2021