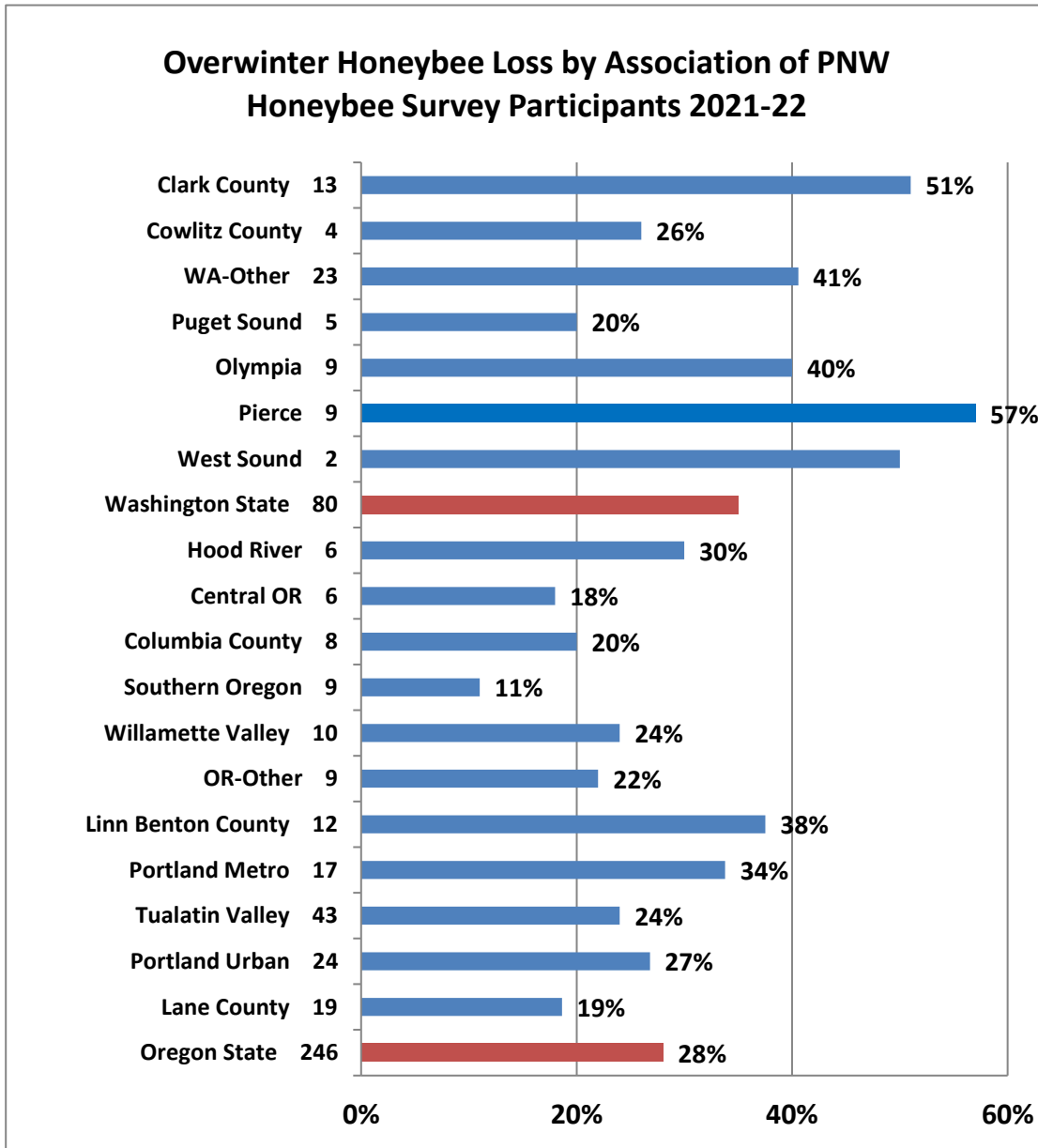


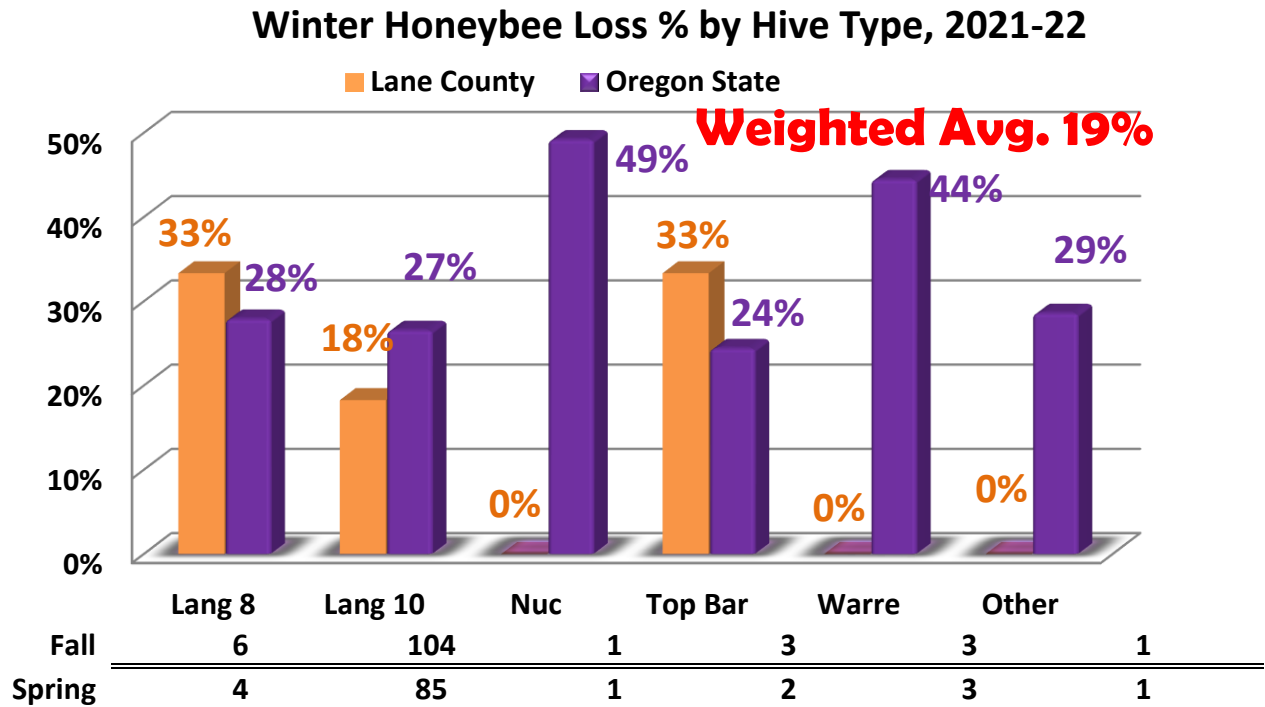
2021-2022 LCBA Winter Loss Report by Dewey M. Caron

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 13th year of such survey activity. I received 246 responses from OR backyarders (82 fewer than last year), keeping anywhere from 1 to 40 colonies; LCBA members sent in 19 surveys, ½ the number compared to last year, reporting on just 118 (last year it was 176) fall colonies.

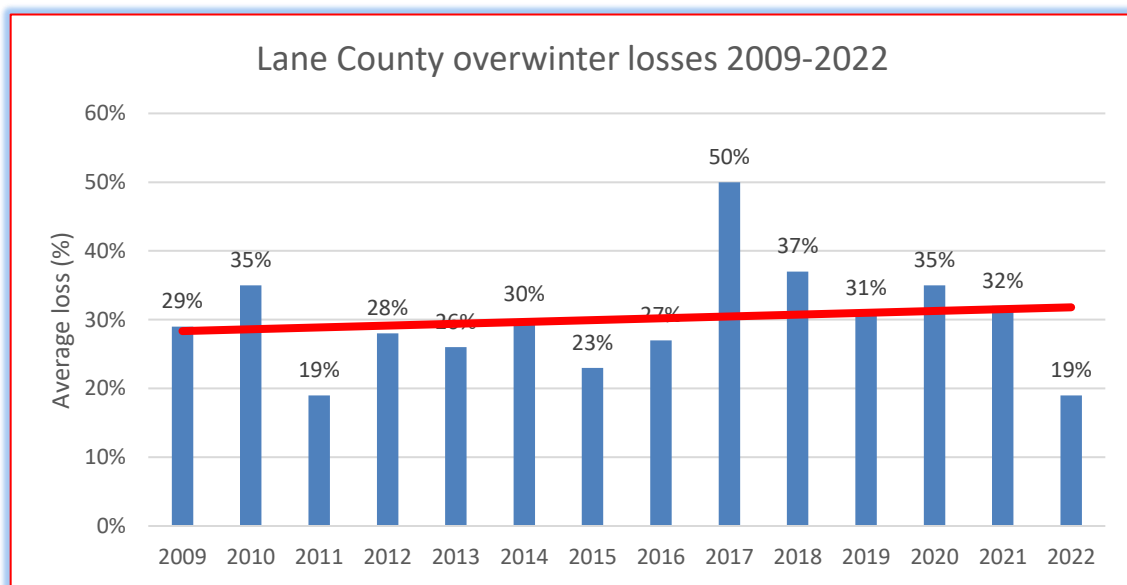


Overwintering losses of LCBA respondents = 19 %, an improvement of nine percentage points from 28% average Oregon losses and thirteen percentage point improvement over last year. Loss level was 12 percentage points lower than the 13- year average losses of Lane beekeepers. The trend line of losses however still is an increasing one. Percent losses, determined by hive types were 33%

for Langstroth 8 (only 6 total in the fall) and 18% for Langstroth 10 frames hives (104 fall colonies). There were few other hives types represented. One of 3 top bar colonies did not survive.

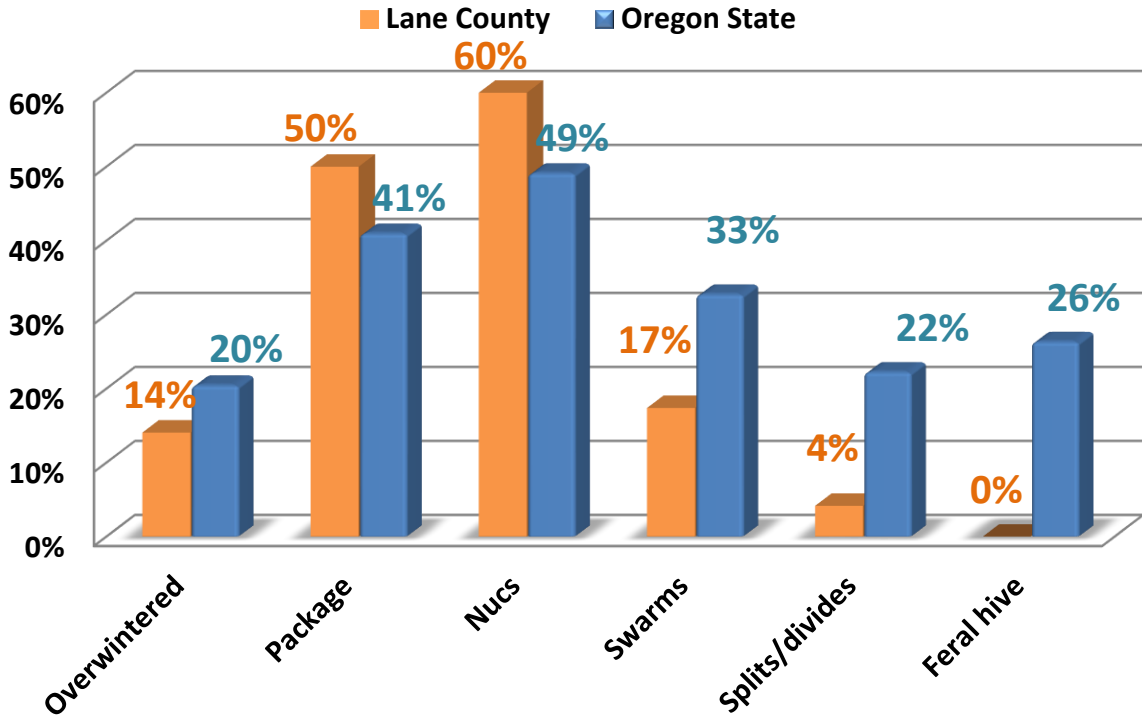


The attached figure shows LCBA losses for past 14 years. Solid line is loss trend. Average for last 14 years is 30%.



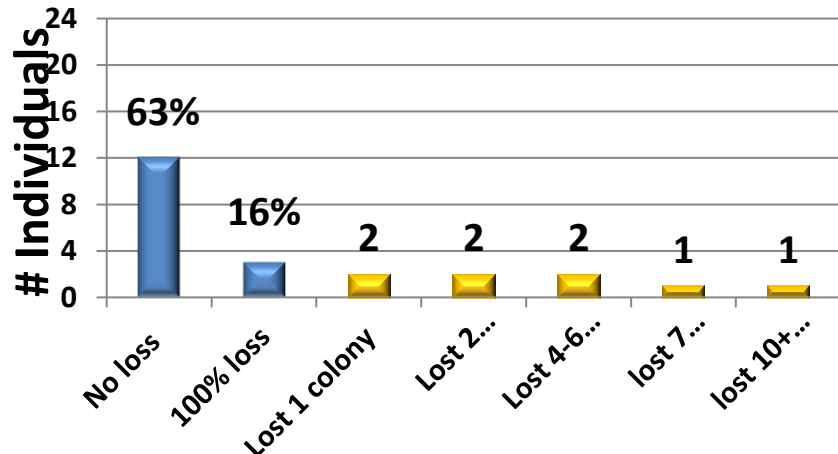
The survey also asked for hive loss by **hive origination**. Members reported 14% loss of previously overwintered colonies, a loss of 50% of packages (5 total) and 60% of nucs (2 of 5 survived). Swarms and splits fared better (17% and only 4% loss level respectively). The graph compares LCBA losses to Oregon statewide numbers.

Winter Honeybee Loss % by Origination, 2021-22



Fall	64	10	5	23	24	0
Spring	55	5	2	19	23	0

Not everyone had loss. In fact, 12 members reported NO LOSS (63% of survey respondents) while 3 respondents (16%) reported total winter loss of colonies. Heaviest loss was 13 colonies. Heaviest loss number was 1 and 2 colonies (2 individuals each). Single individuals lost 4, 5 and 7 colonies – heaviest loss was 13 colonies. (See graphic right).



A-typical of the statewide data, the LCBA respondents are not new beekeepers. Three individuals had one or two years experience (16% of LCBA respondents), and of 3 fall colonies one was lost, another 3 individuals had 4 or 5 years experience (loss rate =8%) while 4 respondents (21%) had 7 or 8 years experience with 21% loss rate. Five individuals had 10-15 years experience (loss rate 19%), 2 had 20+ years experience with 62.5% loss rate. The individual with the greatest experience (53 years) had 100% survival. Nine individuals (47%) had 1 to 3 colonies with loss rate of colonies 10.5%, five individuals had 4 or 5 colonies (loss rate 43%), three individuals had 7-9 colonies (loss rate 9%) and 2 individuals had 12 and 42 colonies with 17% loss rate. See the state report for how as colonies increase per cent loss level decreases remarkably and as years of experience increases the loss rate drops but not as dramatically.

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. Six of 8 individuals (75%) of those having losses (10 had no loss and 1 replied Don't know) said varroa, 2 (25%) each said queen issues and weak in fall. Single responses indicated pesticides, poor wintering yellow jackets, absconding and virus disease. The median level of acceptable loss was 25% which was also the greatest response (7 individuals). Six individuals (32%) indicated 50% to 199% loss level was acceptable.

Why do colonies die?

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

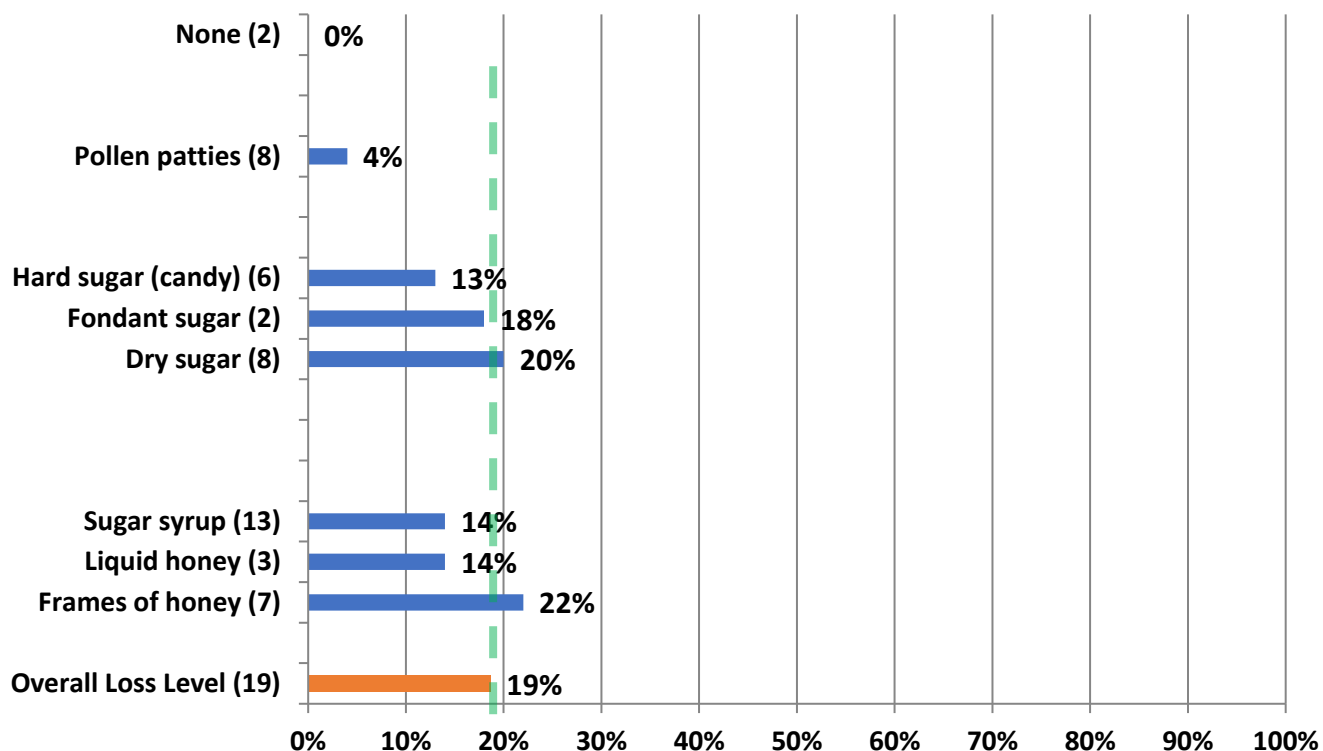
We asked in the survey for information about some managements practiced by respondents. The survey inquired about feeding practices, wintering preparations, sanitation measures utilized, screen bottom board usage, mite monitoring, both non-chemical and chemical mite control techniques and queens. Most 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: LCBA survey respondents checked 44 feeding options = 2.6/individual. Two individuals had no indicated selections and had zero loss (total of 4 colonies managed by these two). Three individuals (18%), other than the two who indicated no feeding, selected a single choice and had 62.5% loss, while the 3 individuals who selected two choices had zero loss. Seven individuals selecting 3 choices had a 24.5% loss and the 4 individuals who had 4 choices had a 17% loss.

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 6 years, individuals doing no feeding had 6 percentage point higher losses (average 47%) i.e. poorer survival, compared to average loss rate of 39%. Average percent doing no feeding = 7% of individuals – this year it was 4%). For LCBA, the 2 individuals of 19 who did no feeding – they had 0 loss.

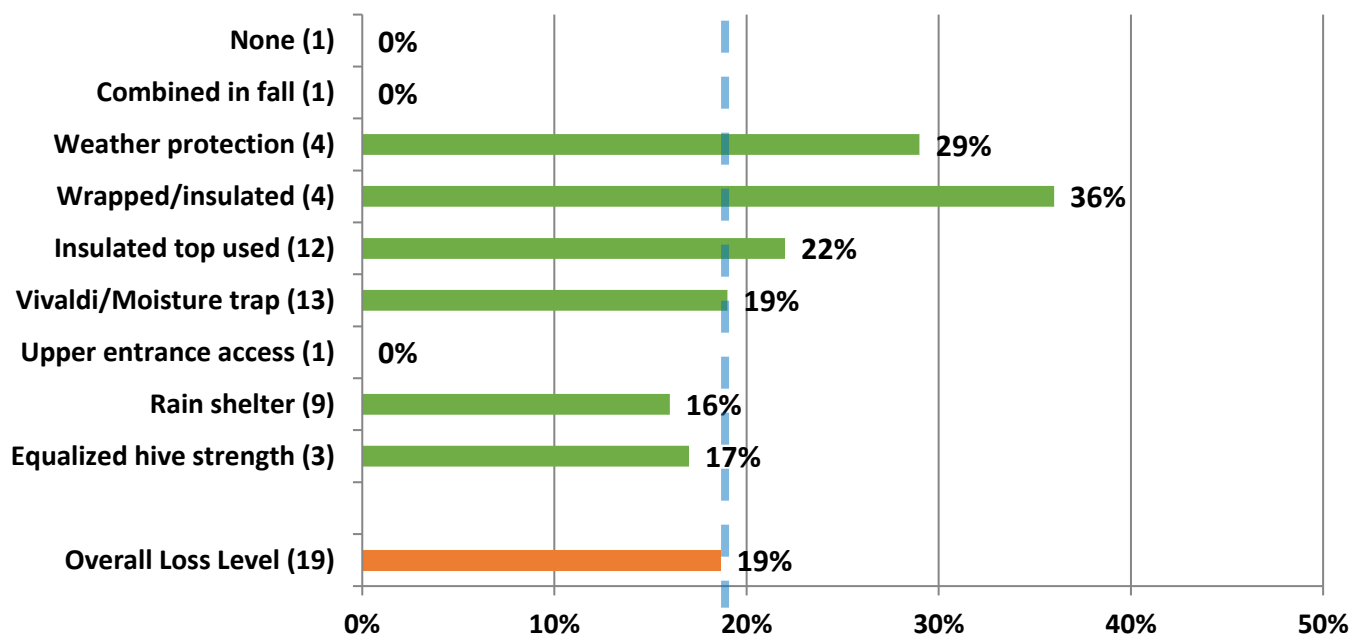
Individuals statewide that fed sugar syrup also had a 6-percentage point lower loss level (average for the 5 years). Those feeding honey (as frames or liquid) had lower loss only during 2 of the past 5 years. LCBA members had lower losses when they fed sugar syrup or liquid honey but not honey in frames.

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 6.

For individuals feeding protein, only the protein patty users showed better survival all 6 years; the eight LCBA members feeding pollen patties had only a 4% winter loss this past year.

WINTERING PRACTICES: We received an average of 2.7/individual selections by LCBA beekeepers on their wintering management practices (more than one option could be chosen). One LCBA individual of 19 respondents indicated doing none of the several listed wintering practices; this individual (managed 3 colonies) had a no winter loss, eighteen individuals (7%) of the statewide respondents indicated doing none of the several listed wintering practices had a better than average 24% winter loss, 4 percentage points lower loss than overall loss of 28%. However, over the past five years individuals that did no winterizing practice (average 12% of individuals) averaged 41.5% loss compared to 39.2% overall average loss of last 5 years, a 2.3 percentage point poorer survival rate. For those indicating some managements, one individual (zero loss) did one single thing, eight did 2, the medium, (9% loss), seven did three (26% loss), 1 each did 4 and 6 with 20% loss.

Winter Management Options w/ Loss Record
 (#) = number individuals



Only 2 winterizing managements improved survival during the past 5 years – wrapping (28.2% lost rate, a 11-percentage point improvement) and upper insulation (30.8%, an 8.4-percentage point improvement). For LCBA members neither of these two helped reduce losses of members this past year. Vivaldi/quilt box, upper entrance (most Vivaldi boards have an upper entrance built into the equipment) and wind/weather protection had only slightly improved survival rates and were not noted in all past 5 years. Rain shelter and equalizing hive

strength slightly improved survival for LCBA members. Two members had no loss by combining and upper entrance.

SANITATION PRACTICES: For LCBA respondents the one individual making no selections lost 1 of 3 colonies. The 7 individuals who avoided moving frames had 27% loss and the 11 individuals who reduced drifting had 15% loss rate. Also, three individuals who said they cleaned hive tool had a 15% loss rate. Statewide, avoiding moving frames and reducing drifting were the two sanitation choices that demonstrated better average survival the past five years – 5-year loss rate was 34.8% for not moving frames which is 2.5 percentage points better survival and 32.2% for reducing drifting a 5 percentage point improvement in survival. Other distinctive measures to reduce drifting had an 8 point improvement in survival this year; it has been a good sanitation in past years as well. Overall sanitation appears to be relatively minor toward improving survival.

SCREEN BOTTOM BOARDS (SBB): Although many beekeepers use SBB to control varroa, BIP and PNW surveys clearly point out they are not a 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. All 19 LCBA members indicated use of screen bottom boards, two on some (not all) of their colonies. Statewide, 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 (for LCBA 3 individuals said they did not block and they lost 4 of 8 colonies: 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.

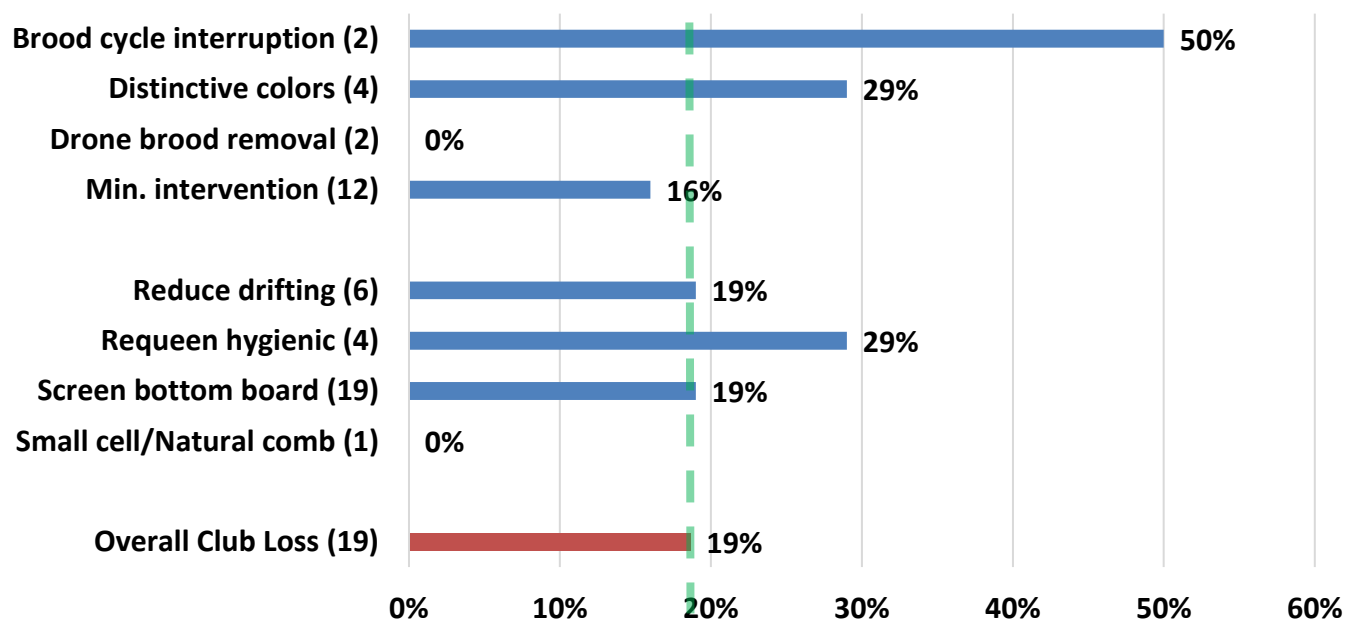
See ***Tools for Varroa Monitoring Guide*** www.honeybeehealthcoalition.org/varroa on the Honey Bee Health Coalition website for a description of and to view videos demonstrating how best to do sugar shake or alcohol wash sampling. The Tools guide also includes suggested mite level to use to base control 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 surveying for mite numbers. The three LSBA member who did not survey had a 50% winter loss. All 19 LCBA individuals said they used a non-chemical mite control while one LCBA did not use a chemical control; that individual lost all four of their colonies (100%). The individual options chosen for non-chemical control are discussed below.

Non-Chemical Mite Control: All 19 LCBA members used at least one non-chemical alternative offered on the survey (+ other category,) Three LCBA individuals used one method (all reported used of Screen bottom board) and had a 62.5% loss, 5 individuals used two (12.5% loss rate), 6 used three (8% loss rate) and 6 individuals did 4, 5 or 6 had had a 20% loss. Clearly using one method with proper timing or using more than one tool improves success. Bar length in figure below represents average loss level of those individuals using each method. Those left of **green dashed** line had improved survival.

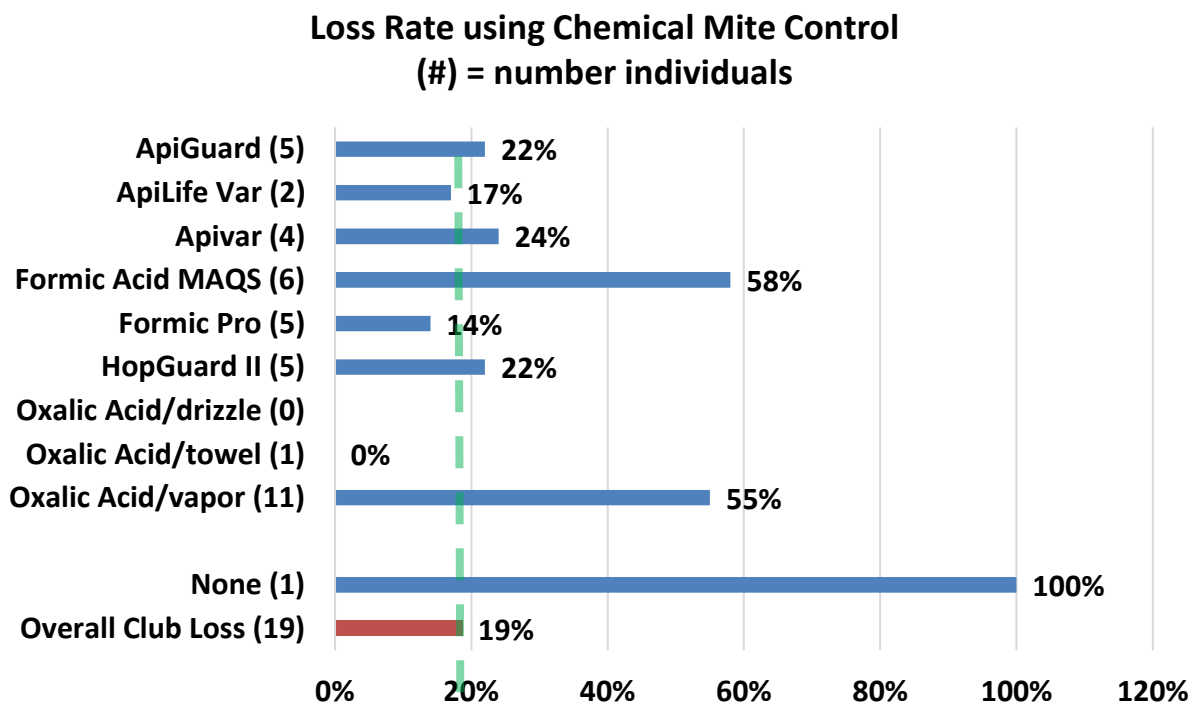
Loss Rate using Non-Chemical Mite Control
 (#) = number individuals



Three of the non-chemical alternatives have demonstrated reduced losses over past 6 years. 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). 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%). Drone brood removal, two individuals and the one individual using small cell had no losses – remaining non-chemical control options did not appear to improve survival. 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, a single individual used NO chemical treatment. They lost all 4 four colonies (100%). Those using chemicals used at rate of 2.2/individual. Four LCBA individuals (22% of total respondents using a chemical) used one chemical (had 18% loss level), nine individuals used two (5% loss level), 3 used 3 (zero loss) and 2 used 4 (these individuals had 41% loss level).

With small numbers of LCBA respondents the graphic of chemical controls does not mirror the results of statewide for the past six years. Consistently the last 6 years four different chemicals have helped Oregon 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) and ApiLifeVar (34.4% average loss level over last six years). In contrast the oxalic acid drizzle average of last 5 years is 37.8% loss level is only 0.4 percentage points above the 5-year average of 37.4%) while formic acid MAGS formulation with 39.4% loss level the last 6 years is just above average loss level of 39.2% the last 6 years. The extended OAE (absorbing oxalic acid and glycerin into sponges) has shown slightly better than average loss. Formic Pro has steadily increased in use – it looks very promising at 25.3% loss level the past three years (when average loss was 36.5%). For LCBA OAV (11 individuals) and MAGS (6 individuals) did not do as well but small numbers skewed club results.



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 June 2022