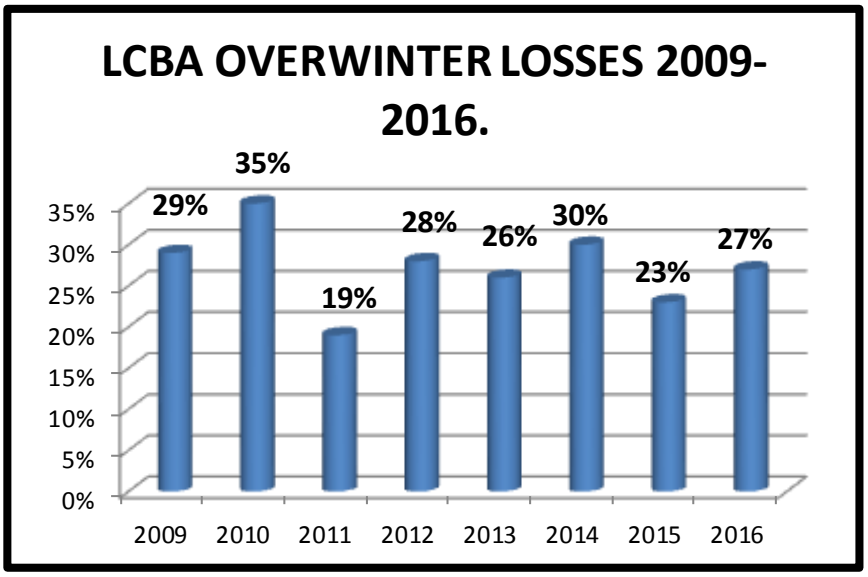
2015 Lane County (LCBA) Winter Loss by Dewey M. Caron & Jenai Fitzpatrick

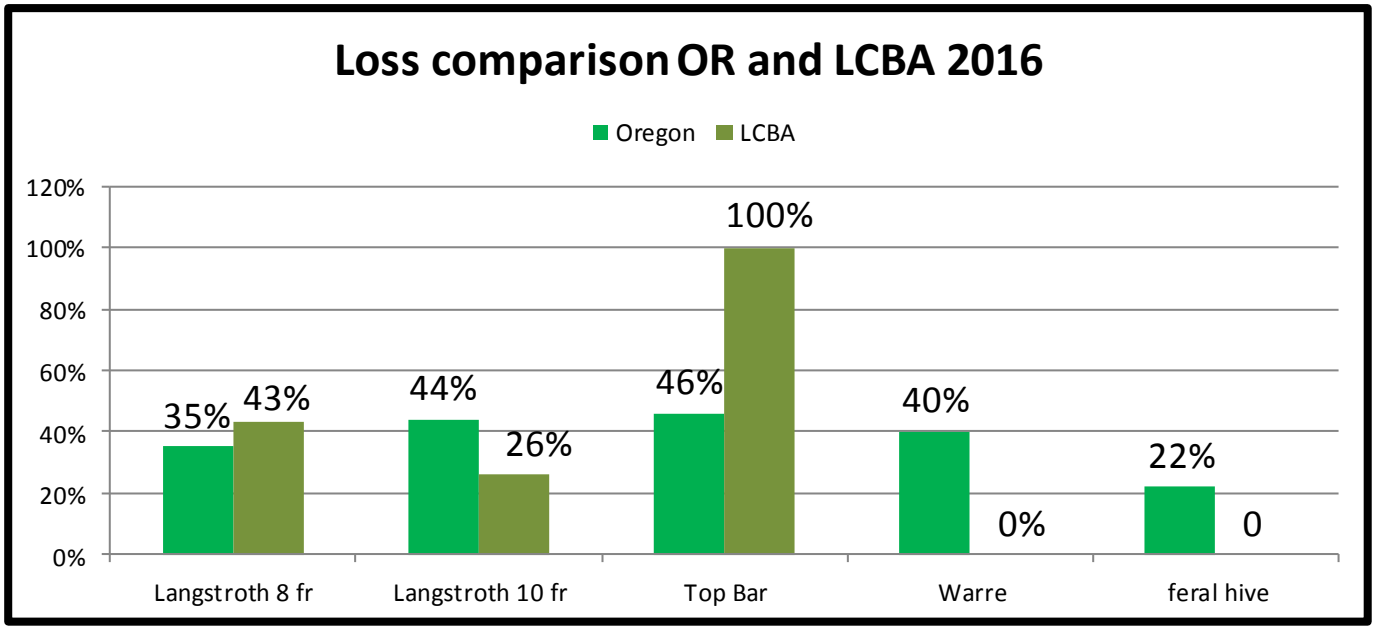
At the April LCBA meeting I distributed a few paper copies and requested LCBA members participate in the 2015-2016 PNW overwintering loss survey via paper or online at www.pnwhoneybeesurvey.com). This was the 8th consecutive year of a loss survey of members.

In all, I received 249 responses from Oregon backyarders, and an additional 52 from Washington beekeepers. Lane County members contributed 36 surveys, providing information on 127 fall colonies. Highest number for any individual was 20 colonies. Survey return was 10 fewer from last year and only ½ the number returned the previous year. I am not certain of the reason for the reduced interest – is it survey fatigue or is such information of little use? Please feel free to email me your questions or concerns to infor@pnwhoneybeesurvey.com.

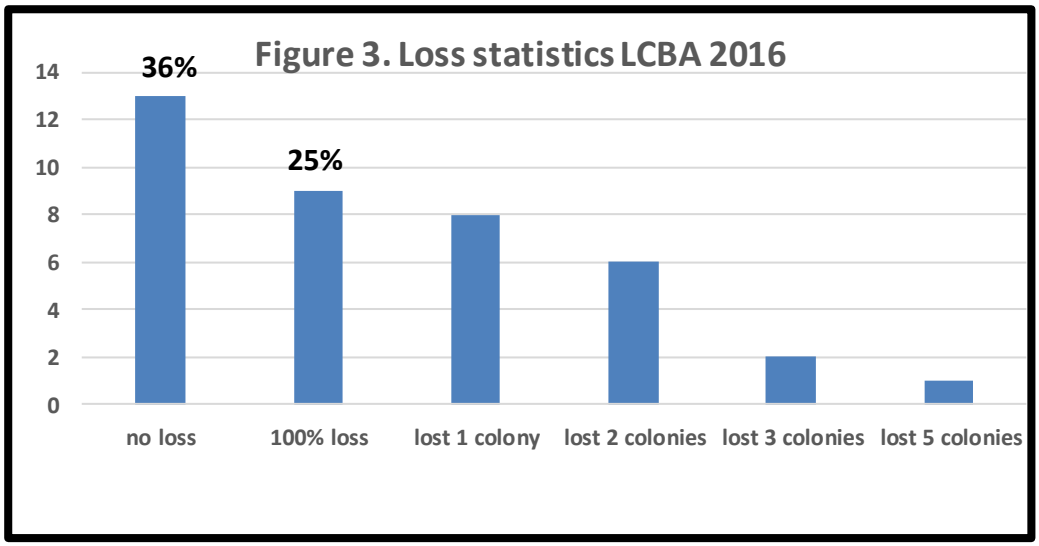
Overwintering losses of the 36 LCBA respondents was 34 colonies = 27% weighted loss rate; 13 percentage points lower than the data received from OR beekeepers. Losses this past winter were 4 percentage points higher than last year but exactly the average of the last 7 survey years. Figure 1



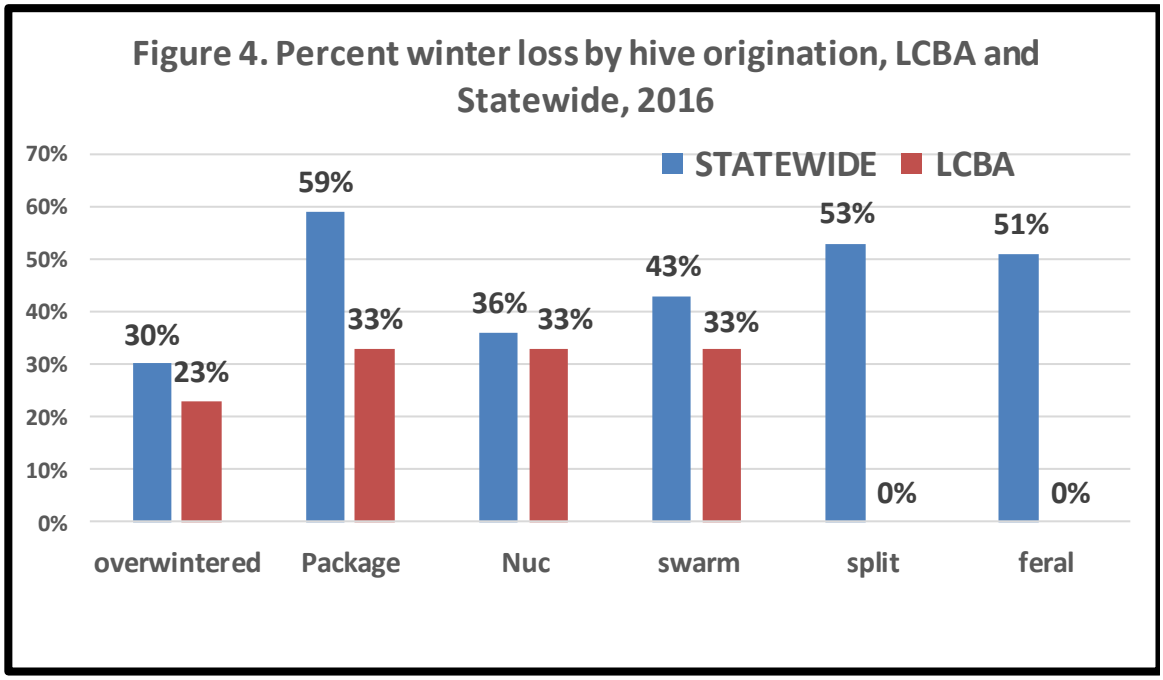
Loss rate was determined for 8 and 10 frame Langstroth hives, 5-frame nucs (none reported from LCBA members), Top Bar, Warré and "other" hive types. LCBA member respondents started winter with 111 Langstroth 10-frame hives (87% of total), 7 Langstroth 8-frame hives, 7 Top bar colonies (which all survived), and a single Warré and "other" (a feral hive), neither of which survived. The accompanying Figure 2 shows percent loss for each hive type compared with the Oregon (1007 colonies) data base. See www.pnwhoneybeesurvey.com for comparison with last year.



Not everyone had loss. Thirteen individuals reported total winter survival, while 9 reported losing 100% of their colonies. Eight individuals lost 1 colony, 6 individuals loss 2, 2 lost 3 colonies and one individual lost 5 colonies, the heaviest loss. Median number of colonies was 2; highest number maintained by one individual was 20 colonies. Twenty individuals (56%) had 1 or 2 colonies, thirteen had 3 to 7 colonies (36%) and 3 had 10 or more. See Figure 3.

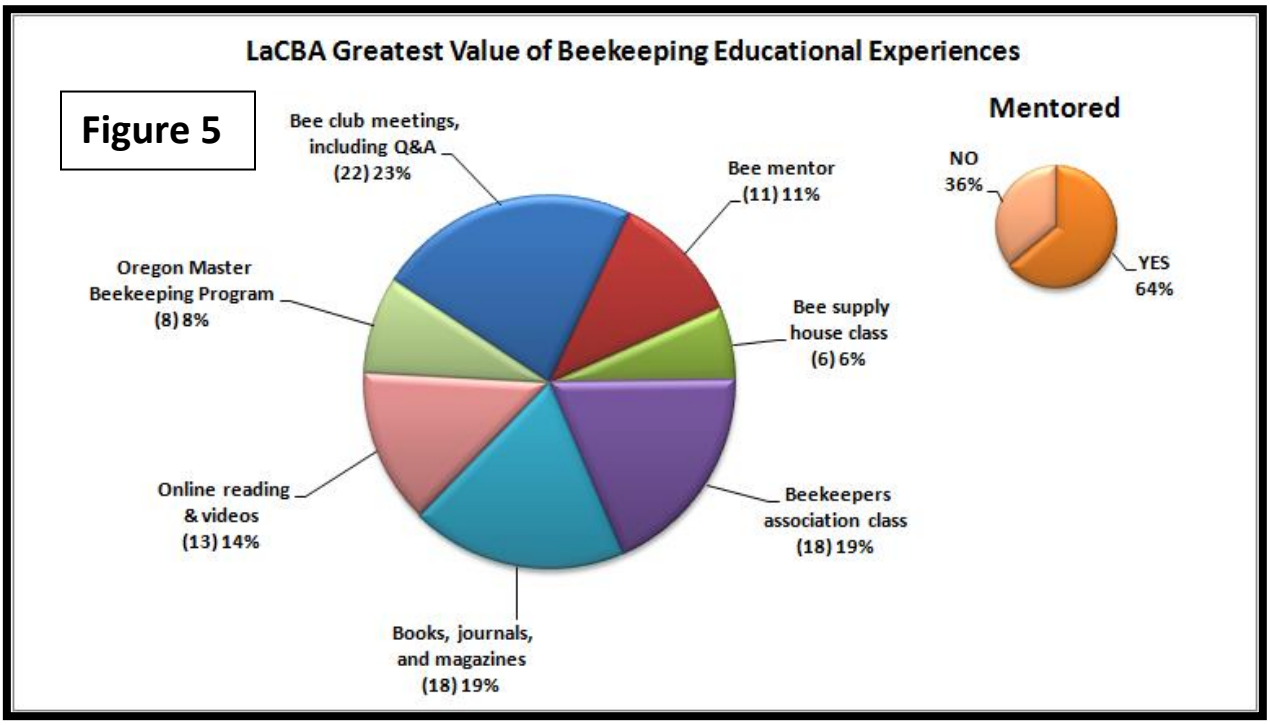


The survey also asked for hive loss by hive origination. Seventy one of 94 overwintered LCBA member colonies were alive in the spring (24% loss rate), 7 percentage points lower than statewide survival of overwintering colonies. Respondents reported a 33% loss level of newly installed packages, nucs and swarms with no loss for splits or feral transfer. All were lower loss levels than reported by other OR beekeepers. See Figure 4.



The 36 individuals returning surveys were largely not new beekeepers. Only four individuals were first year beekeepers, Fifteen (42%) had 1 to 3 years bee experience, 36% had 4 to 7 years of beekeeping experience while 25% had 9+ years of beekeeping, with 47 years the highest. Two individuals had 2 apiaries, with all 8 colonies in the 2nd apiaries not surviving. One person had to move bees during the year.

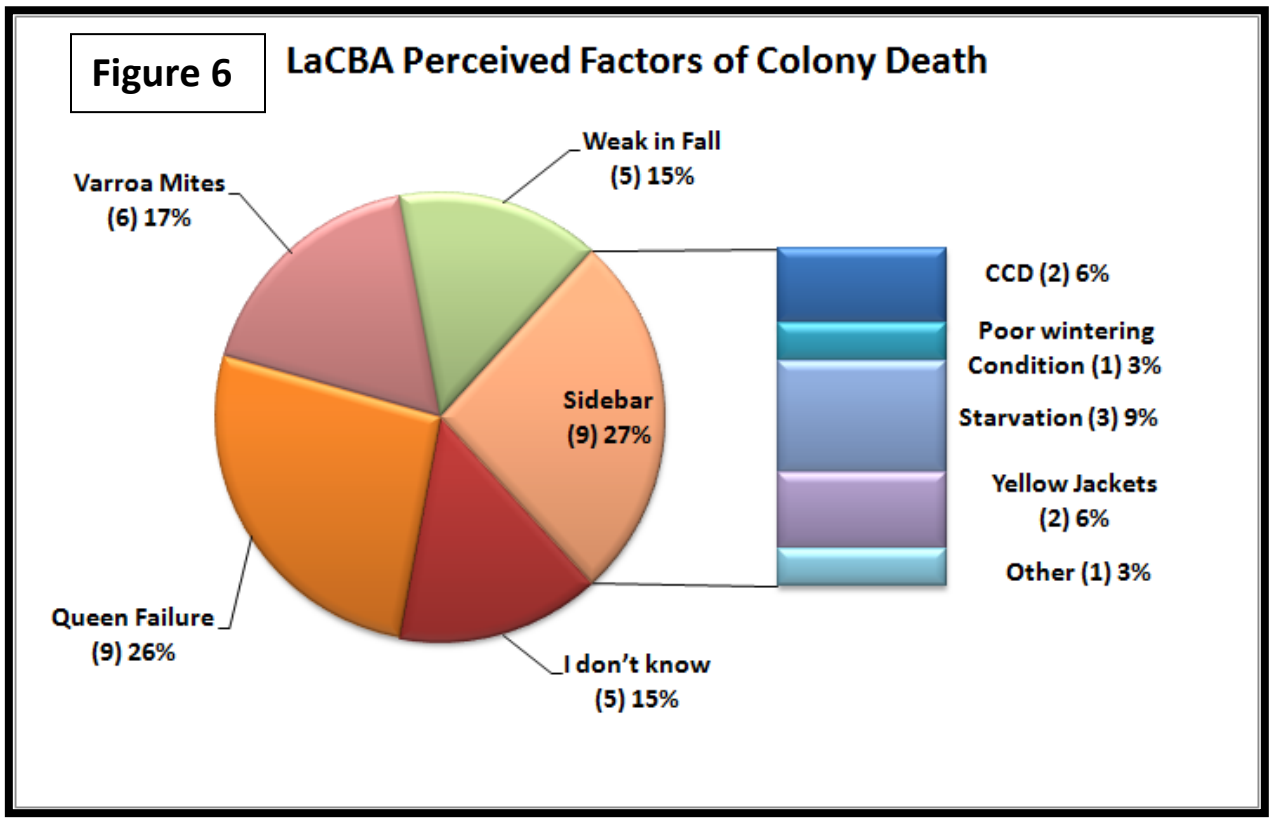
When asked to indicate where the majority of their beekeeping education was received, LCBA respondent numbers varied only slightly from statewide, with Bee club meetings indicated of greatest value followed by The LCBA Bee class and Books, journals and magazines. Online readings and videos and bee mentor were also rated high in great and of some value. Sixty four percent said they had a mentor/experienced beekeeper available to help them in their first years with bees.



We asked for those 23 individuals that had colony loss to estimate what the felt the reason might have been. Multiple responses were permitted. Nine individuals listed queen failure, 6 varroa mites, 5 weak in the fall and 5 also for I don't know; 3 indicated starvation. For the total 249 OR beekeepers, weak in the fall and varroa were ranked as top reasons for loss (17% each), with starvation, poor wintering conditions and I don't know each at 11% of listing choice. When asked for an acceptable loss level 12 individuals said zero, 10 said 5, 10 or 15%, 5 said 20%, 7 indicated 25% and 2 chose 50%.

There is no easy way to verify reason(s) for colony loss, nor a consensus of an acceptable level. Colonies in the same apiary may die for different reasons. **Doing the forensics is the first step in seeking to solve a heavy loss problem. More attention to colony strength and possibility of winter starvation will help reduce some of the losses. Control of varroa mites will also help toward loss reduction**.

Why do colonies die? There appears to be no single reason for loss and 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 thought to be mites, pesticides, declining nutritional adequacy of the environment and diseases, especially viruses



and Nosema. 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.

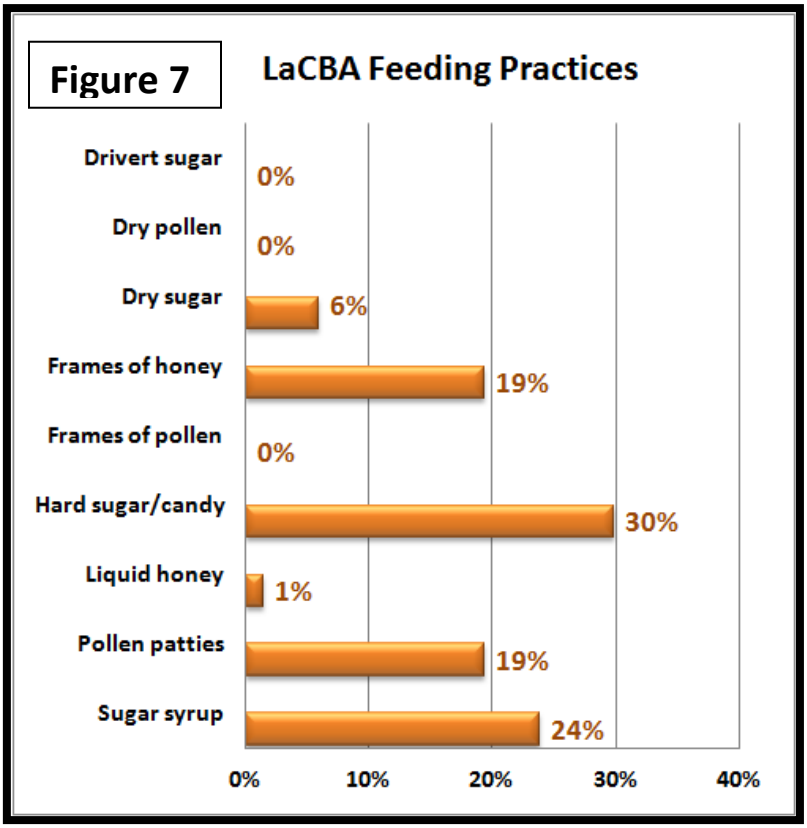
Langstroth a hundred and sixty years ago wrote about the importance of taking losses in fall management, saying if the beekeeper neglects such attention to his/her colonies 45% loss levels may occur, depending upon winter weather conditions. It can be argued that losses of 30, 40, 50% or more might be "normal." Older, more experienced beekeepers recall when loss levels were 15% or less. Larger-scale beekeepers have issues with replacing losses about 15% while smaller-scale backyard beekeepers either replace their losses or simply give up after losing their colonies. Honey production fluctuates each year but once again seems to be declining on average. Stress of movement of colonies to pollination rentals and finding suitable "clean" forage sites for both larger and smaller scale beekeepers is a challenge. Numbers of U.S. bee colonies have declined since the 1940s, returning to numbers for 100 years ago, while worldwide numbers of bee colonies are steadily increasing.

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. Varroa mites and the virus they transmit are considered a major factor, but by no means the only reason, colonies are not as healthy as they should be.

General hive practices

We asked in the survey for information about some managements practiced by respondents. Multiple responses were encouraged.

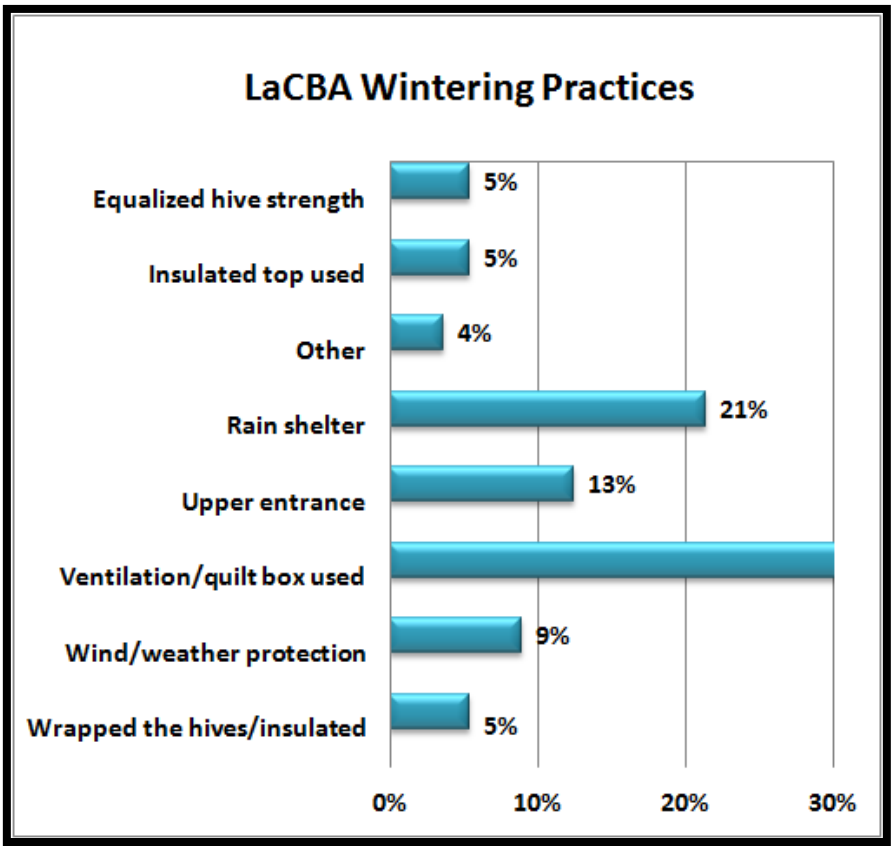
FEEDINGS: There is general consensus that feeding is one management that assists bee colonies. The most popular feeding option selected by LCBA members was feeding of hard sugar/candy followed by sugar syrup then frames of honey. Feeding pollen patties was indicated by the same number of individuals as frames of honey. These four were the same top choices for OR beekeepers. Results indicate a high level of feeding management of both sugar/honey and supplemental protein. No one material or method has been shown to be the most advantageous; feeding hard candy, dry sugar or fondant is preferred during the rainy months so as not to add additional moisture stress to colonies. Figure 7.



WINTERING PRACTICES: Four LCBA individuals (11%) did NOT do any of the Wintering practices. Most popular selected choices were use of ventilation/quilt box/lid insulation (58%) and a rain shelter, same as in each of past two years. Upper entrance use was followed by wind/weather protection (listed under "other" in 2014-15). Screen bottom board and reducing hive volume were the 2 others listed. The wintering selections demonstrate that LCBA beekeepers are taking extra measures to help colonies survive winter conditions. What we will do with data is compare loss rate with these practices to determine if there is a trend or if one or a few of

these reduce winter loss rate. LCBA and OR beekeeper responses were very similar (see www.pnwhoneybeesurvey.com for OR state beekeeper responses).

Figure 8



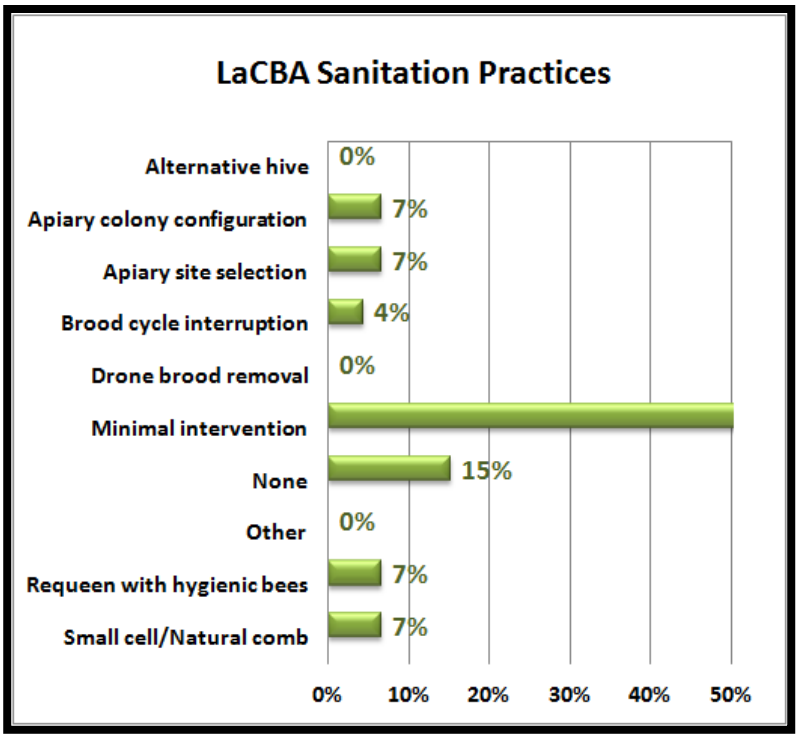
SANITATION PRACTICES: We can do more basic sanitation (some prefer use of term bee biosecurity) in our bee care. Seven individuals said they did not practice any of the 8 offered alternatives. **Minimal hive intervention (selected by 54%) was the most common option selected** – this was encouraging as less intervention means reduced opportunity to compromise efforts of the bees themselves; needless, excessive inspections/manipulations can potentially interfere with what the bees are doing to stay healthy. Responses in Figure 9.

Following minimal hive intervention, apiary site selection, colony configuration in the apiary were next most popular sanitation practice. Site selection, both of apiary and colony configuration within the apiary are important sanitation choices because providing colonies with a distinctive "addresses" has been shown to reduce drifting of adult bees and help to reduce incidence of disease and mites.

Small cell/natural brood comb, along with requeening with hygienic bees are proactive approaches, for better mite population control. Along with drone brood removal (not done by any LCBA respondent) and brood cycle interruption, are all difficult to do and highly

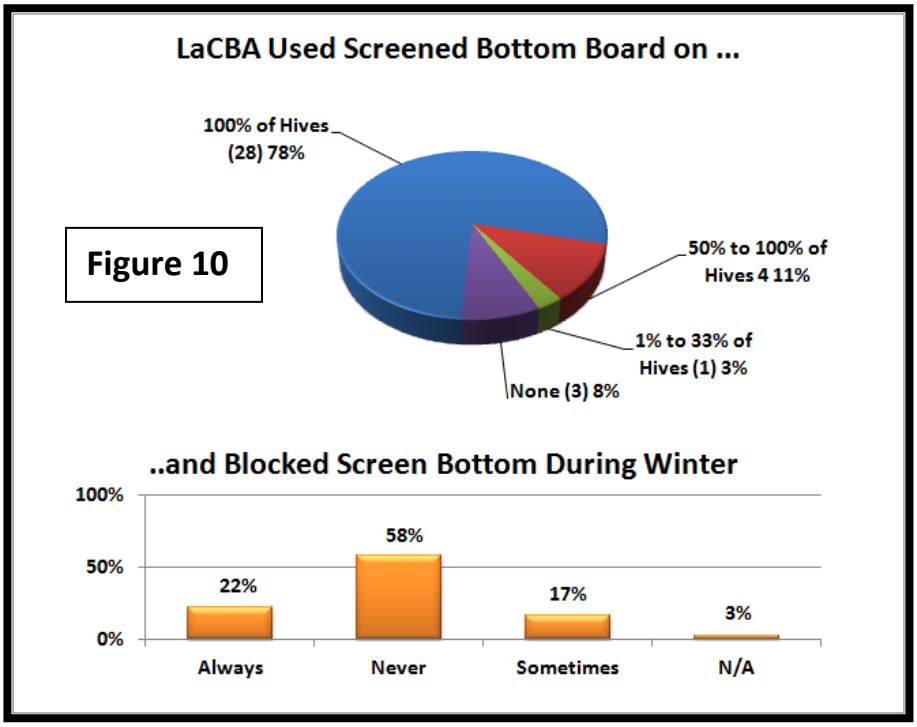
interventive. All but the small cell/natural comb management have been demonstrated to be workable alternatives to chemicals in mite control. NOTE: Some of the choices are not sanitation per se but rather mite control options – this question and options listed needs to be modified.

Figure 9



SCREEN BOTTOM BOARDS: Our survey asked what percentage of Oregon backyard beekeeper hives had screen bottom boards and whether they were blocked during the winter. Three TVBA individuals said they did not use screened bottoms; 28 individuals used them on all their hives as illustrated in Figure 10. Twenty one individuals (the never response) did not block them in the winter season, while eight members said they

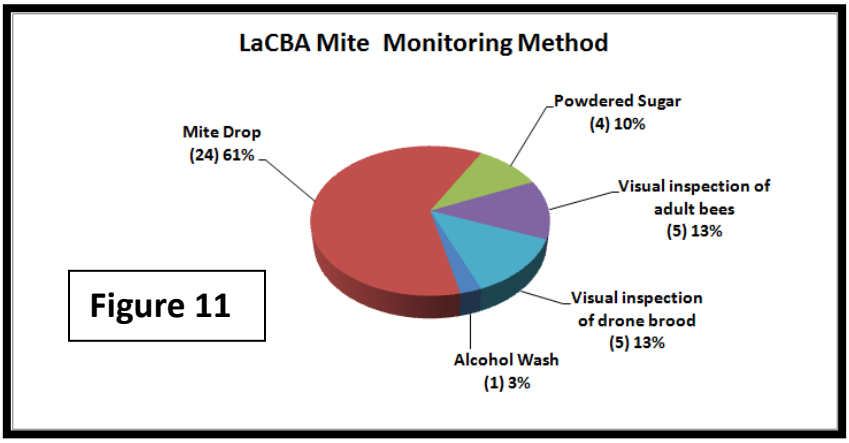
Figure 10



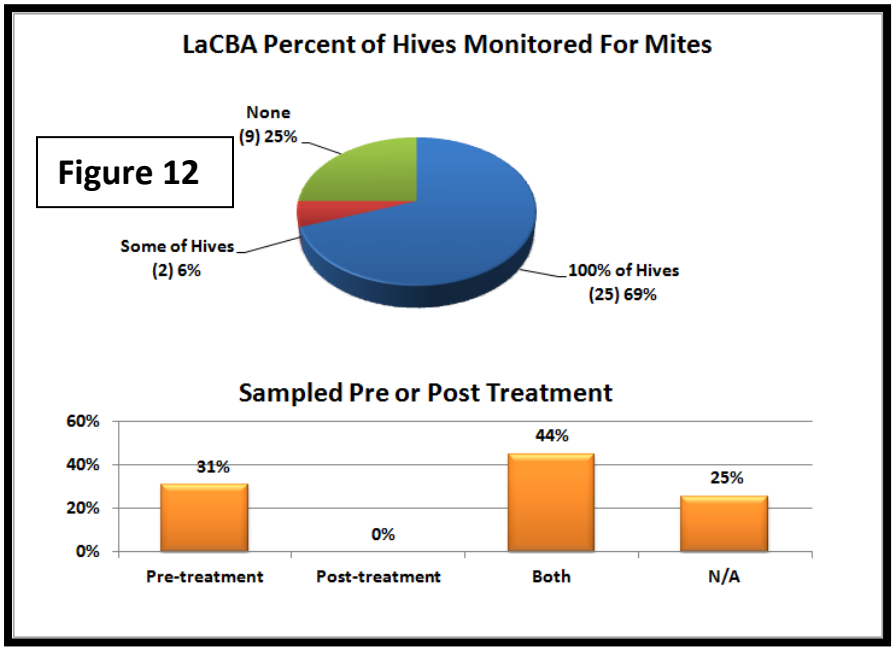
always did close them in winter. There is no good science on whether open or closed bottoms make a difference in overwinteing but some beekeepers “feel” bees do better with it closed overwinter. An open bottom, at least part of the year, can assist the bees in keeping their hive cleaner.

Mite monitoring/sampling and control management

We asked percentage of hives monitored for mites, 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. For those that did monitor, sticky board mite drop was used by 24 individuals, visual inspection by 5, both adult bees and brood, and four used powdered sugar shake. Alcohol wash was the least employed. Figure 11.



Nine individuals said they did not monitor for mites while 7 monitored 100% of their hives. More monitored both pre and post treatment than only once.



Use of medications and control treatments

The survey asked about chemical and non-chemical mite treatments and also about use of chemicals for mite control. Twenty three LCBA individuals (64%) said they did employ a mite control which was 7 percentage points higher than OR beekeepers.

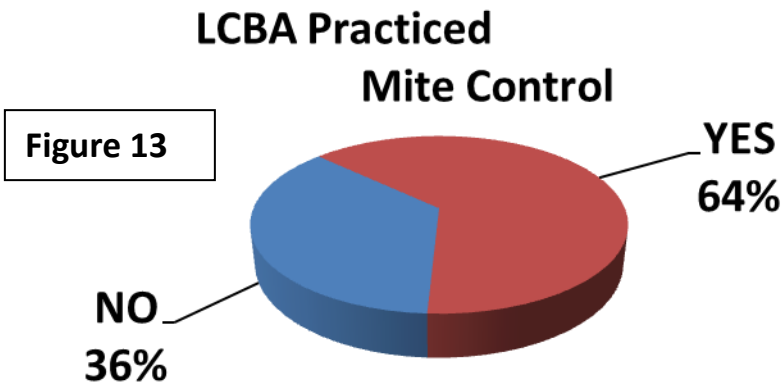


Figure 13

Non-Chemical control: Of 10 non-chemical alternatives offered on the survey, nine respondents indicated they did not use any of the choices. For the respondents who checked at least one choice (more than one selection was permitted), only use of screened bottom board (25 individuals) and minimal hive inspection (7 individuals were selected by more than two members. The highly interventive and difficult managements of drone brood removal and brood interruption were collectively used by only two individuals. Both are labor intensive and require some experience to do successfully. They work well only under limited circumstances. Two individuals indicated they requeened with hygienic bees. Two also said they utilized small cell/natural

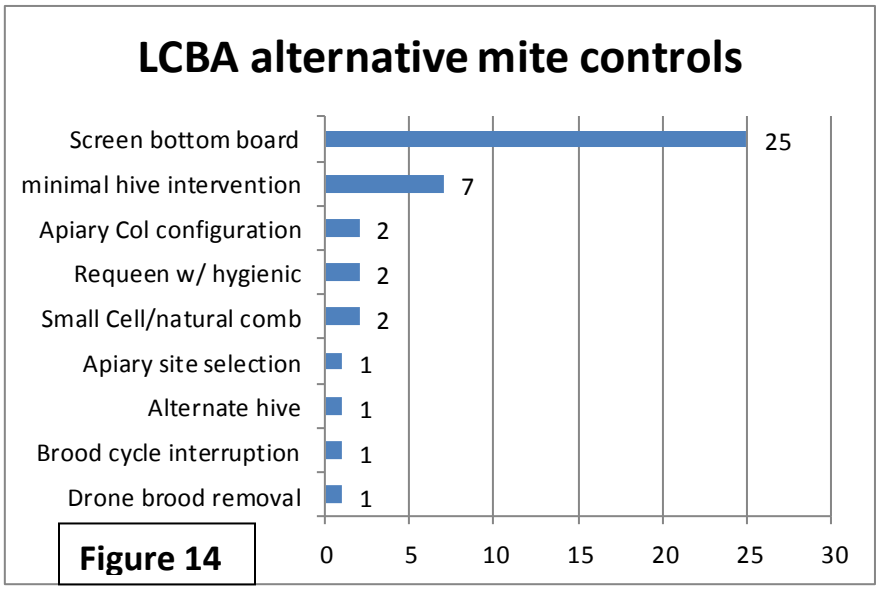
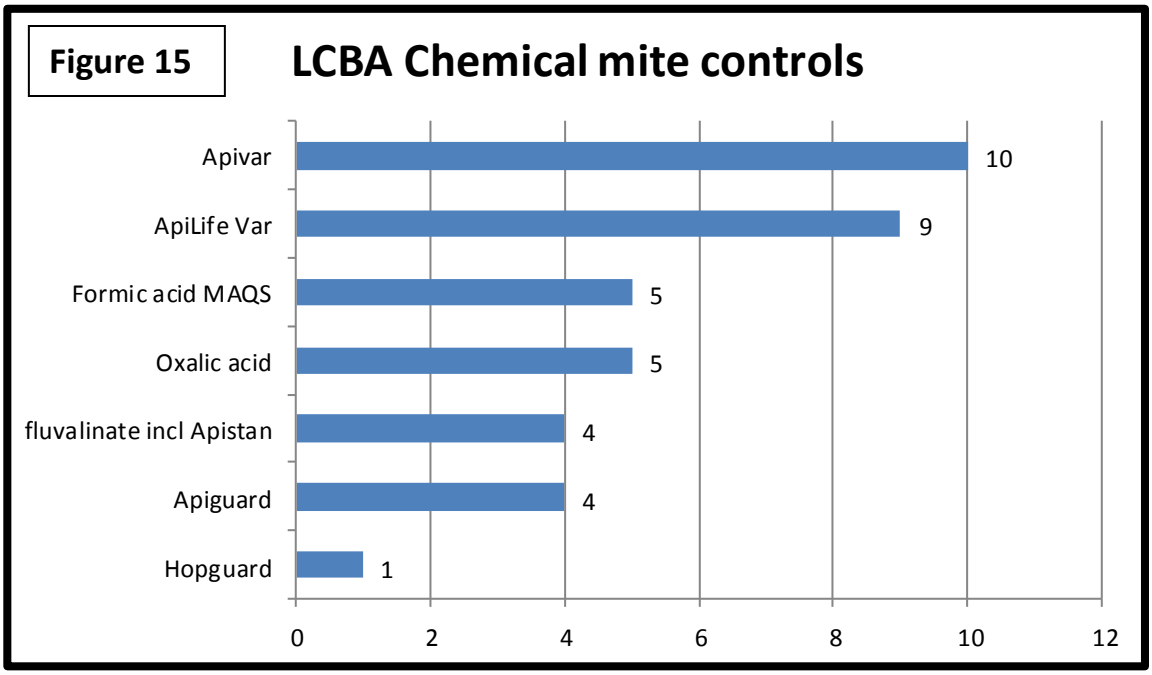


Figure 14

comb, which may or may not be useful. **Timing of use of these manipulations needs to be completed in time for the bees to properly prepare for winter and insure successful mite reduction.**

Chemical Mite control: We also asked about chemicals used for mite control. Thirteen of total respondents said they did not use any of the 9 alternatives. For the respondents statewide who checked at least one (more than one selection was permitted), formic acid (MAQS) was the most commonly used material followed closely by Apivar and Apiguard. For LCBA Apivar, the most effective mite killing chemical was the top choice (10 individuals used it) followed by the essential oil ApiLife Var. Formic acid (MAQS) and Oxalic acid were used by 5 individuals each. Hopguard II was used by one individual..

Figure 15



Six individuals of 144 that responded statewide (4%) indicated they treated with Terramycin for foulbrood disease, none was a LCBA member. Thirty individuals (21%) indicated use of Fumigillin for Nosema disease control, 1 in LCBA. Prophylactic use of antibiotics is not generally advisable.

What works? Alternative of drone brood removal is a non-chemical treatment that works in most colonies during spring buildup. You can buy a drone foundation frame or put a shallow frame into a standard brood box and have bees construct drone cells below the shallow bottom bar. The colony doesn't need that many drones so you harvest them in capped stage to discard with their mites. This technique only works during spring buildup.

Breaking the brood cycle, with requeening, especially if hygienic queen stock or local selected stock is used to requeen or replace removed queens, can also keep mite numbers at

manageable levels in most bee colonies. Both are a lot of work and new beekeepers should not seek to use such techniques until they have a better understanding of bee colony life cycles and queen event behaviors in colonies.

There is a wide array of chemical treatments available to treat varroa mites and are often the best choice when colony mite populations are high as they can be very effective. Materials that can be used include acids such as formic acid (Mite-Away Quick Strips, or MAQS – especially the ½ dose treatment) and Oxalic or the Hopquard II product when there is little or no brood present, essential oils Apiguard or ApiLife-Var, under narrow temperature conditions and the highly effective synthetic miticide, Apivar (amitraz). All have possible serious negative effects to the beekeeper applicator and they can contaminate the beeswax and honey of the hive. Only use of MAQS is permitted when supers are on colonies. There may be significant queen or brood losses with many of the chemicals and post treatment sampling is recommended to insure the control has worked as expected. It is important to follow label directions. Consult Tools for Varroa Management from Honey Bee Health Coalition, available for free download from OSBA website or www.honeybeehealthcoaltion.org/varroa

Queens

We hear lots of issues related to queen "problems". On the survey we asked what percentage of loss could be attributed to queen problems. Nineteen individuals said none and ten other said I don't know.

Queen events can be a significant factor contributing to a colony not performing as expected. We asked "Did you or did your hive requeen, in any form during the year". Thirty one percent of OR beekeepers said no as did one percent fewer TVBA members. Responses were very similar to previous year with slightly more saying no (36%) and slightly fewer saying yes (45% responded yes last year).

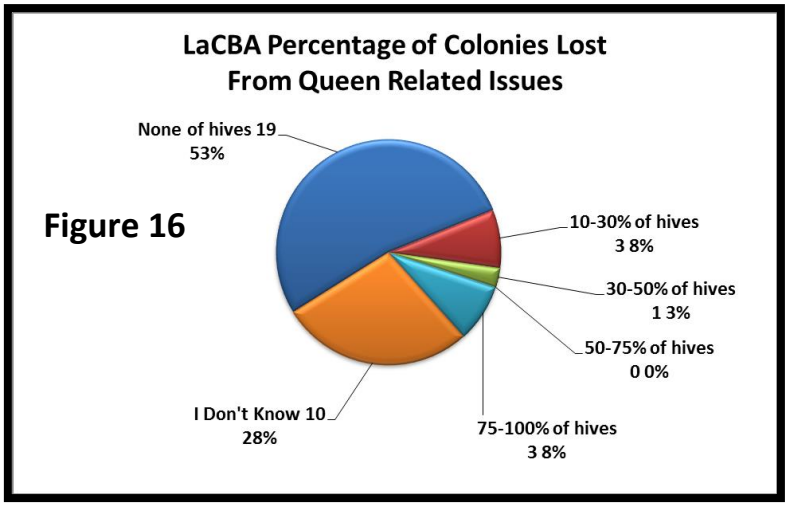
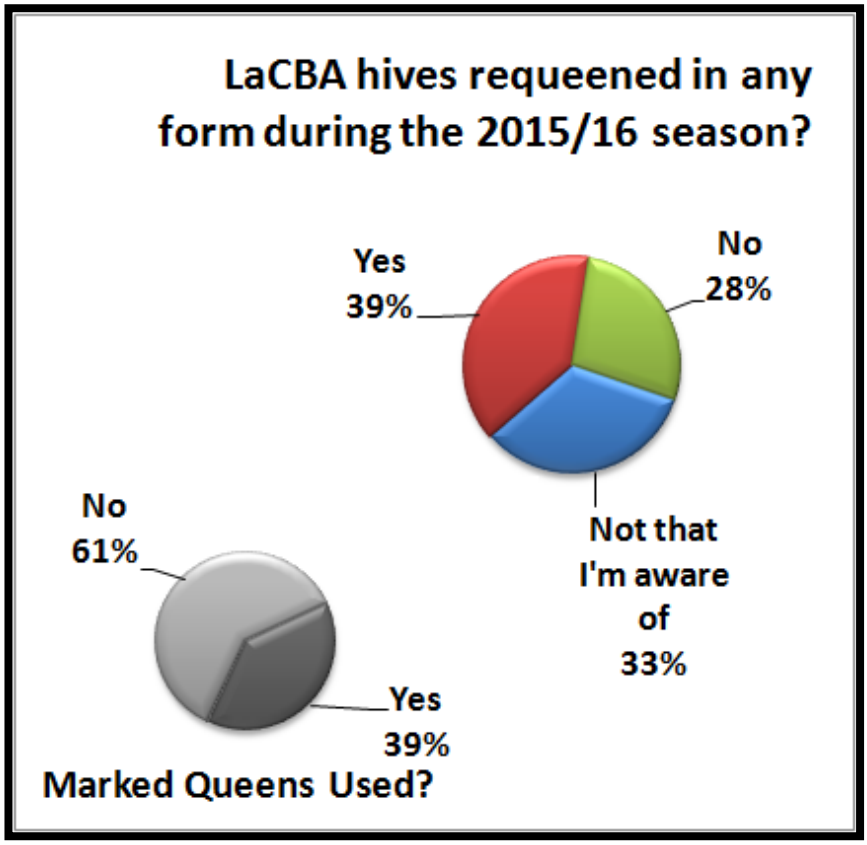


Figure 16

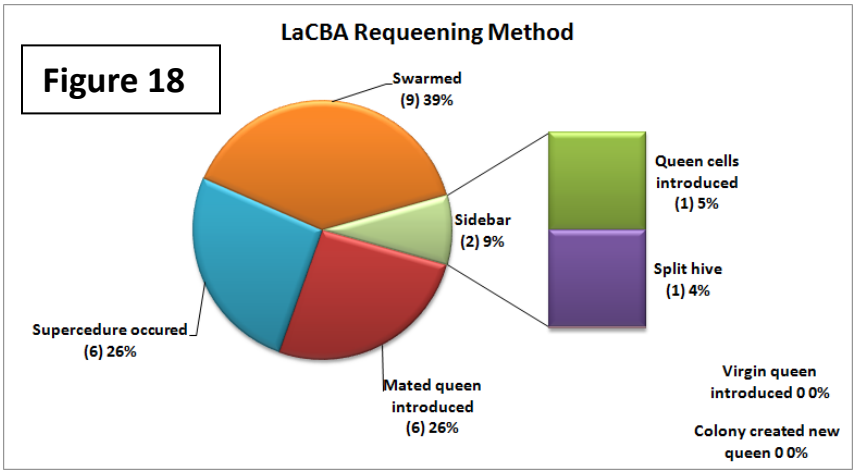
We asked if queens were marked. Fourteen LCBA individuals said yes. It would be difficult to be able to say yes or no if a hive requeened, with absence of queen marking, unless requeening was done by the beekeeper.

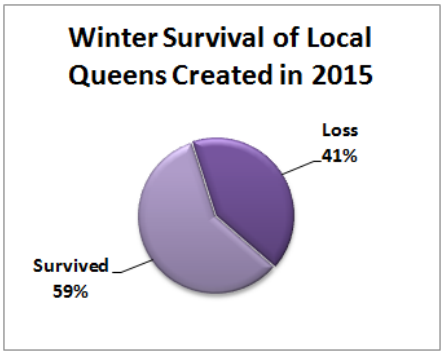
Figure 17



Responding to the question "How did bees/you requeen " 15 LCBA beekeepers indicated requeening by the bees via swarming and supersedure. Mated queen introduction was done by 6 individuals and one each by splitting or use of queen cell.

Figure 18





Fifty one individuals indicated they reared 150 local queens via splitting/grafting or other method; in TVBA 5 individuals reared 13 queens with 10 surviving. For OR beekeepers, three-fifths of locally reared queens survived winter. See Figure 19.

Figure 19

We also asked this year about harvest of bee products. Twenty four LCBA individuals said they harvest a total of 1783 pounds of honey (simple average50 pounds/individual). Ten also harvested beeswax and 4 propolis.

Closing comments: As indicated we will further analyze the loss by managements (feeding/wintering practices/sanitation) as well as losses relative to use of control techniques/chemicals utilized. Some of this information is additionally available on the BeeInformed website (www.beeinformed.org) and individuals are encouraged to examine that data base as well.

We intend to refine this instrument for another season and hope you will join in response next April. We have a blog on the pnwhoneybeesurvey.com and will respond to any questions/concerns you might have.

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

NOTE: Convention of LaBCA is used on some graphs to differentiate Lance Co OR from Lewis Co WA beekeeper responses.

Dewey Caron and Jenai Fitzpatrick, June 2016