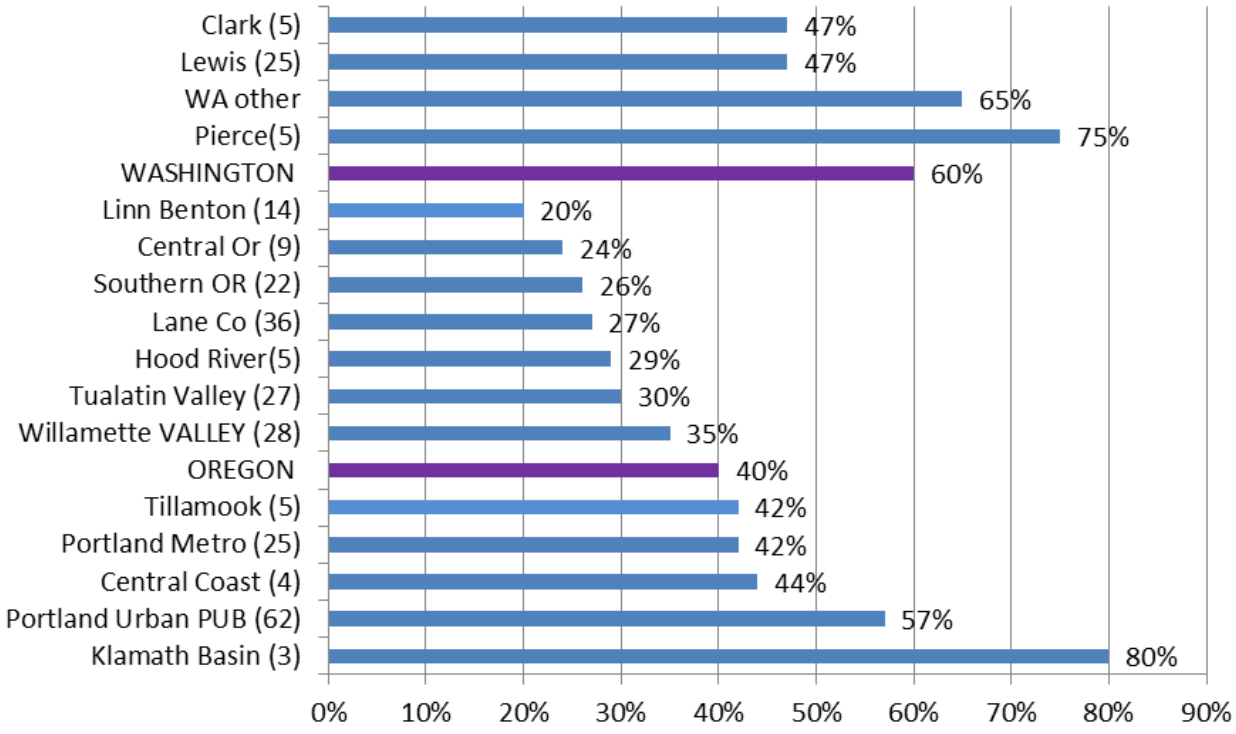
2016 Southern Oregon Winter Loss by Dewey M. Caron & Jenai Fitzpatrick

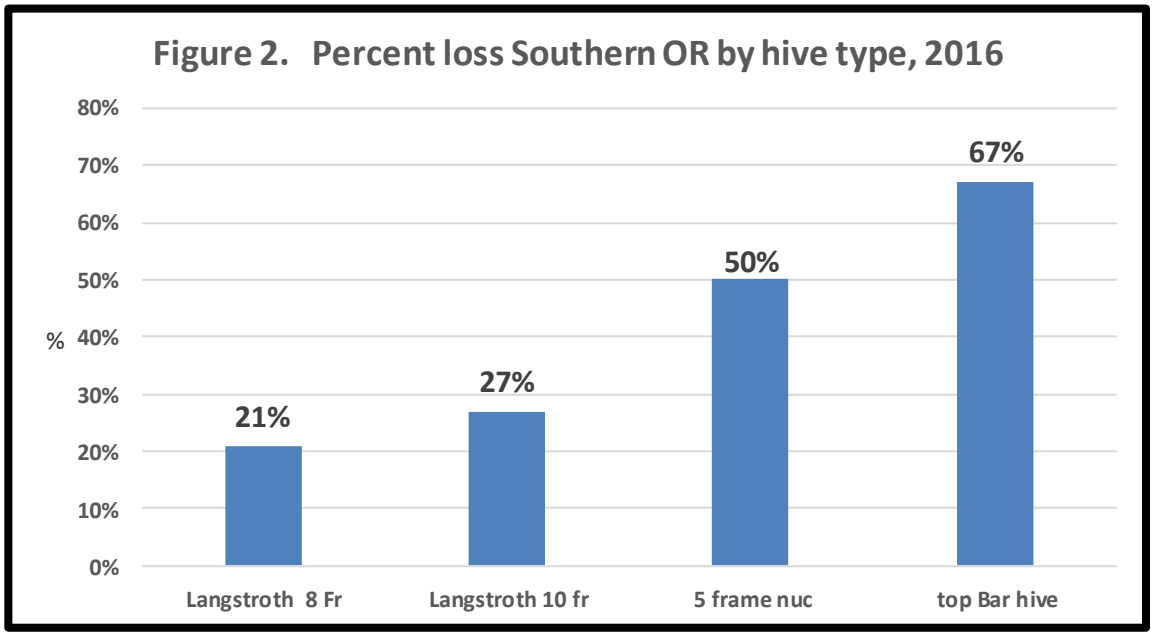
SOBA members were directed to a web-based survey document (posted at www.pnwhoneybeesurvey.com) in our continuing effort to define overwintering loss rates and successes, now the 8th spring survey. I received 219 responses from OR backyarders, plus 52 others from Washington beekeepers, keeping anywhere from 1 to 43 colonies. Southern tier beekeepers of Klamath Basin (KBBA) contributed 3 and Southern Oregon (SOBA) contributed 22 surveys.

Figure 1 % Overwinter loss by Association, 2016

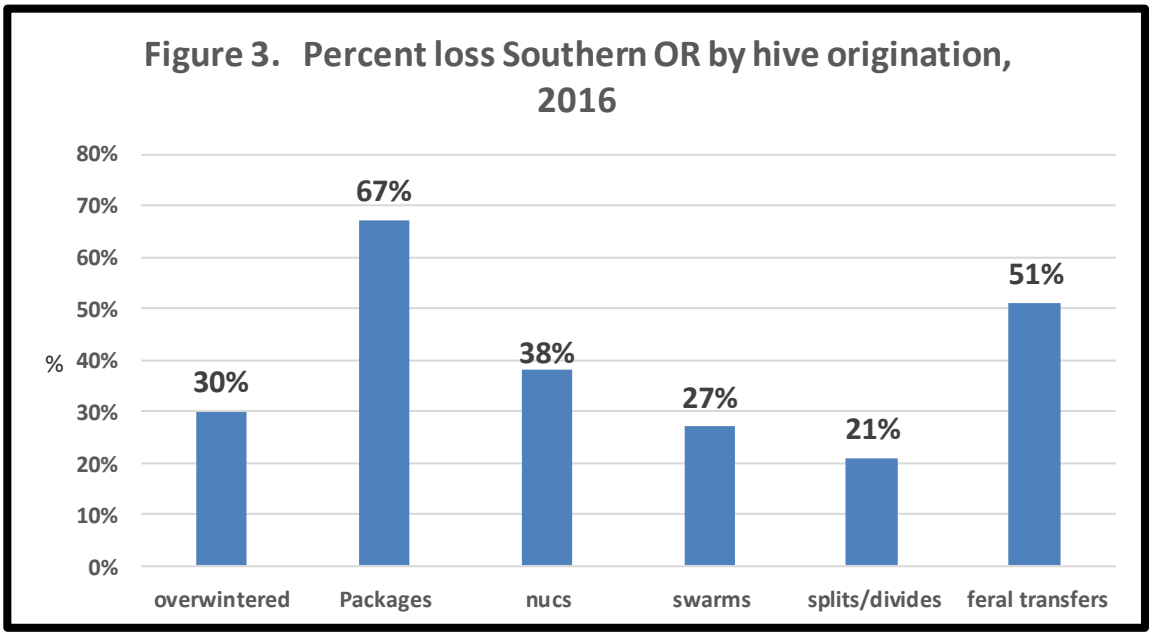


Overwintering losses of the 3 KBBA respondents, 35 colonies =80%,was the highest of all while losses of SOBA members (72 colonies) was 26%, considerably lower than the overall rate for Oregon beekeepers of 40% Last year SOBA loss rate was 27%, slightly lower than the statewide loss of 29% (database of 230 OR backyarders.) The heaviest losses were those of the Portland Urban association PUB. See Figure 1.

Percent loss was determined for Langstroth 8 and 10 frame hive types, 5 frame nucs and top bar hives. Data in Figure 2. SOBA members started winter with 47 8-frame Langstroth hives and 19 10-frame hives, of which 6 died overwinter. There were 4 nucs, 2 survived and 3 top bar hives only one of which survived. Not included in Figure 2 is the single Warré hive – it survived.



The survey also asked for hive loss by hive origination. Twenty one of 30 overwintered SOBA member colonies were alive in the spring (30% loss rate), slightly better compared to statewide (34%) There was only a single package of 3 that survived whereas 10 of 16 nucs survived (38%). Survival of splits/divides and swarm captures (15 of each) were better than overwintered hive survival. Figure 3



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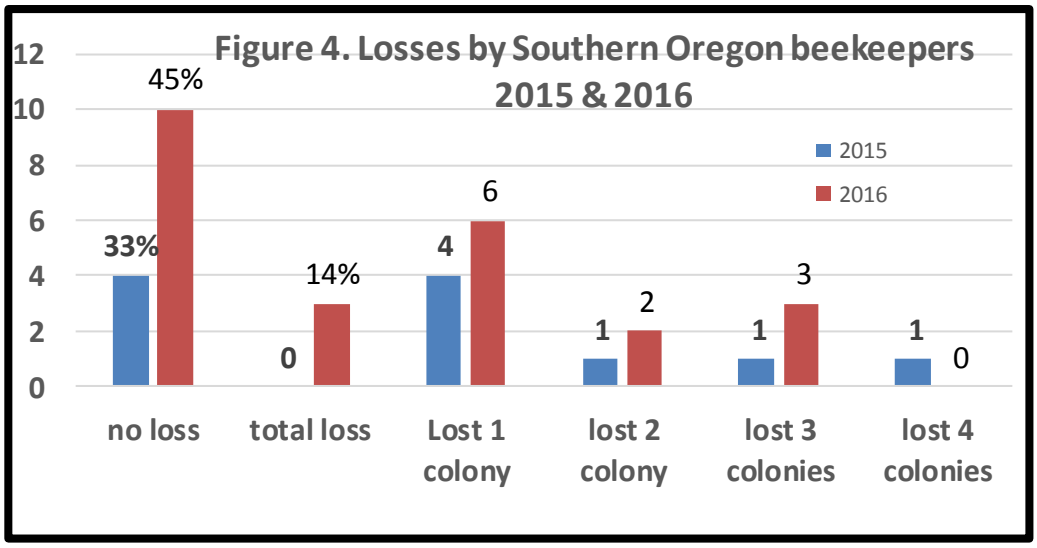
Not everyone had loss. Ten SOBA individuals (45%) reported total winter survival; three individuals lost 100% of their colonies. Heaviest loss by KBBA members was 11 colonies and 3 colonies by a SOBA member. Data for SOBA shown graphically below in Figure 4.



The vast majority of respondents to the survey were new beekeepers. Fifteen SOBA respondents had 1, 2 or 3 colonies (68%) with 4 having 8+ colonies; the greatest colony number was 15. Ten of 22 SOBA members had 1, 2 or 3 years' experience (45.5%) and only 2 had more than 8+ year's experience, with 25 years the highest. Three SOBA individuals had more than one apiary location and one KBBA did as well. One SOBA individual moved hives but only a short distance on same property.

When asked to indicate where the majority of their beekeeping education was received, both KBBA and SOBA highly valued the monthly bee meetings, compared to statewide responses. SOBA member response shown below in Figure 5 also shows the Association class of great value. Bee mentors and Books, journals and magazines were also highly ranked. 71% of SOBA respondents said they had a mentor available in their early beekeeping education and all 3 of KBBA members did likewise, compared to 69% statewide.

Reasons for Losses

We asked individuals that had colony loss to estimate what the reason might have been. Multiple responses were permitted. Of 276 statewide responses, 45 chose weak in the fall (16%), 40 selected Varroa mites (15%) and 14% said queen failure.I don't know was also 14%. The 22 SOBA responses were similar choices with Weak in the fall and starvation indicted by 5 individuals each followed by pesticides and poor overwintering conditions. See Figure 6.

Figure 5 SOBA Perceived Value of Various Beekeeping Educational Experiences

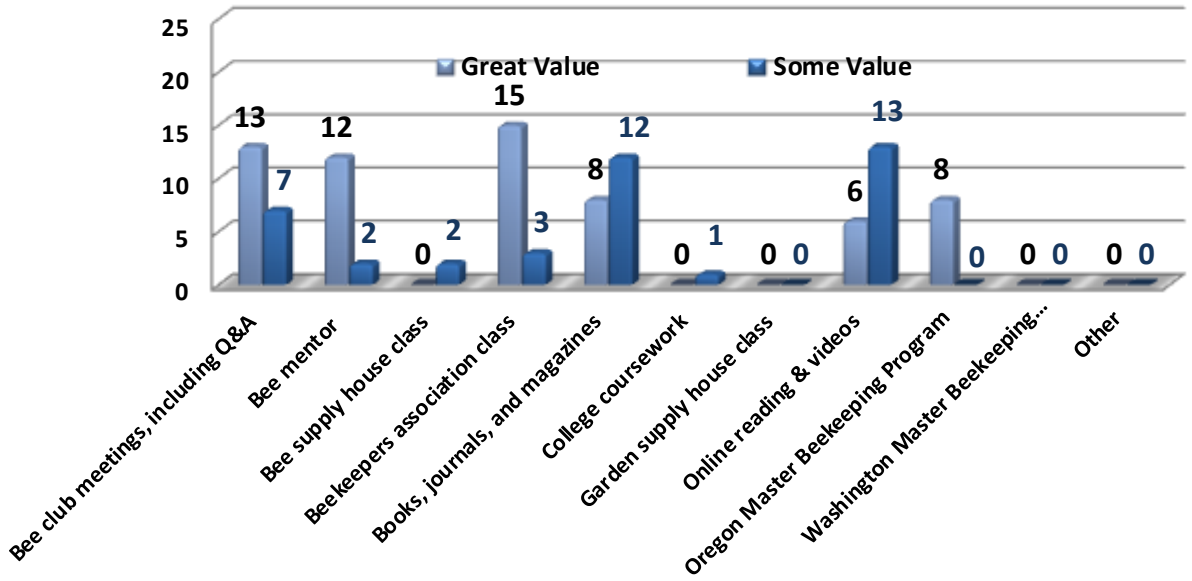
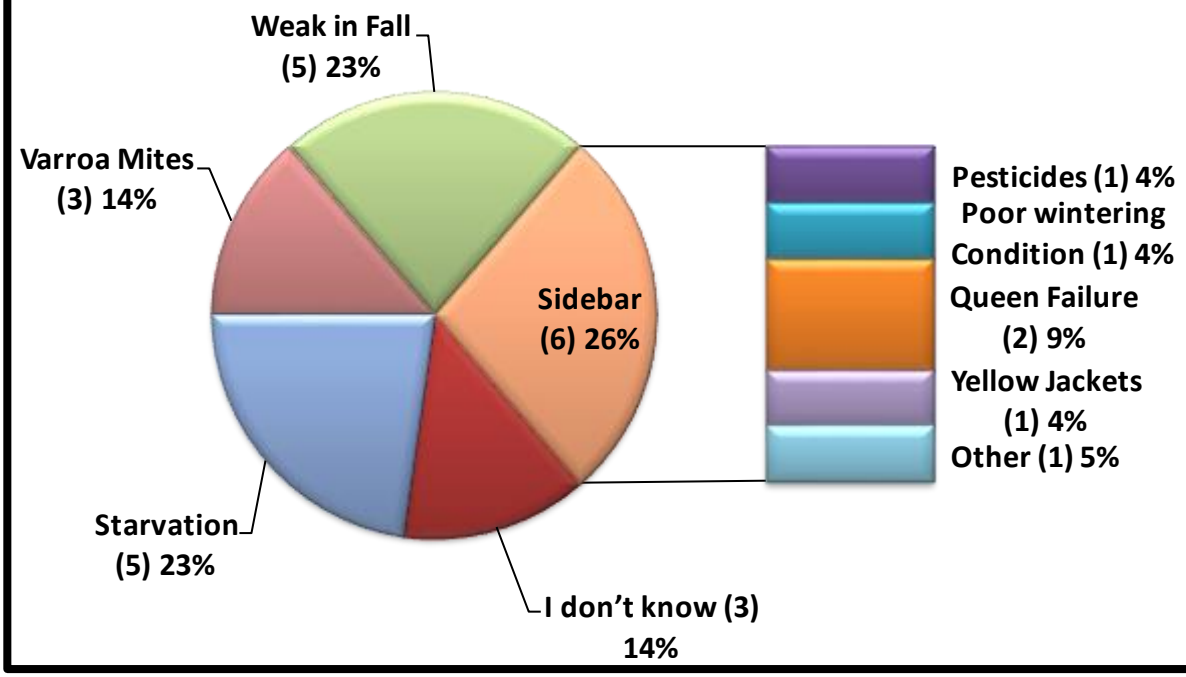


Figure 6 SOBA Perceived Factors of Colony Death



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 are thought to be mites, pesticides, declining nutrition adequacy of the environment and diseases, especially viruses and Nosema. Management, failure to do something or doing things incorrectly, remains a factor in our losses. What effects our alteration to the bee's natural environment and other external factors play in colony losses are not at all clear.

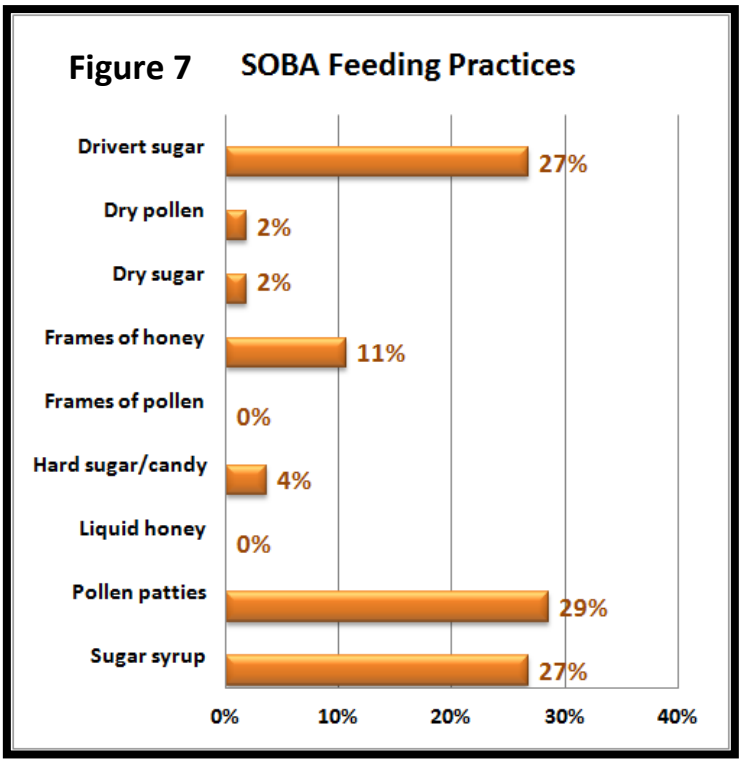
Langstroth wrote about the importance of taking losses in fall management saying if the beekeeper neglects such attention to his/her colonies 45% loss levels may occur, depending upon variable environmental conditions. It can be argued that losses of 30, 40, 50% or more might be "normal." Older, more experienced beekeepers recall when loss levels were 15% or less. Honey production fluctuates each year but, once again, seem to be declining on average. Numbers of U.S. bee colonies have declined since the 1940s, returning to numbers for 100 years ago but worldwide numbers of bee colonies are steadily increasing.

So there is no simple answer to explain the levels of current losses nor is it possible to demonstrate that they are excessive for all the issues facing honey bees in the current environment.

General Hive practices

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

Feeding: The per cent of SOBA responses (56 total) are shown in bar graph below (Figure 7). Two individuals (8% of total) did not do any of the options offered. Sugar syrup (27%) and pollen patty (29%) feeding were the most common managements. Feeding Drivert (27%) and providing frames of honey (11%) were next most common. Responses mirror



those of rest of beekeepers statewide.

Comparing losses with specific feeding practices revealed that no single management improved the winter loss rate. That does not mean feeding is not of value as feeding may be done for many more reasons than just to improve winter survival.

WINTERING PRACTICES: We received 49 responses about wintering management practices from SOBA members (more than one option could be chosen). Figure 8 shows comparison of wintering management response of last year and current overwinter period. A single individual indicated none of the several listed wintering practices was done. The three most common wintering managements selected was ventilation/use of a quilt box/lid insulation (28%), upper entrance (14%) and use of a rain shelter (16%) for southern Oregon beekeepers. In category other, clustering hives together, reduced bottom entrance and wrapping hive for winter were listed. See Figure 8. As above for, no single wintering practice improved winter survival; in the larger data base comparison of those who did none of the managements to those who did something showed a slight advantage for those doing something.

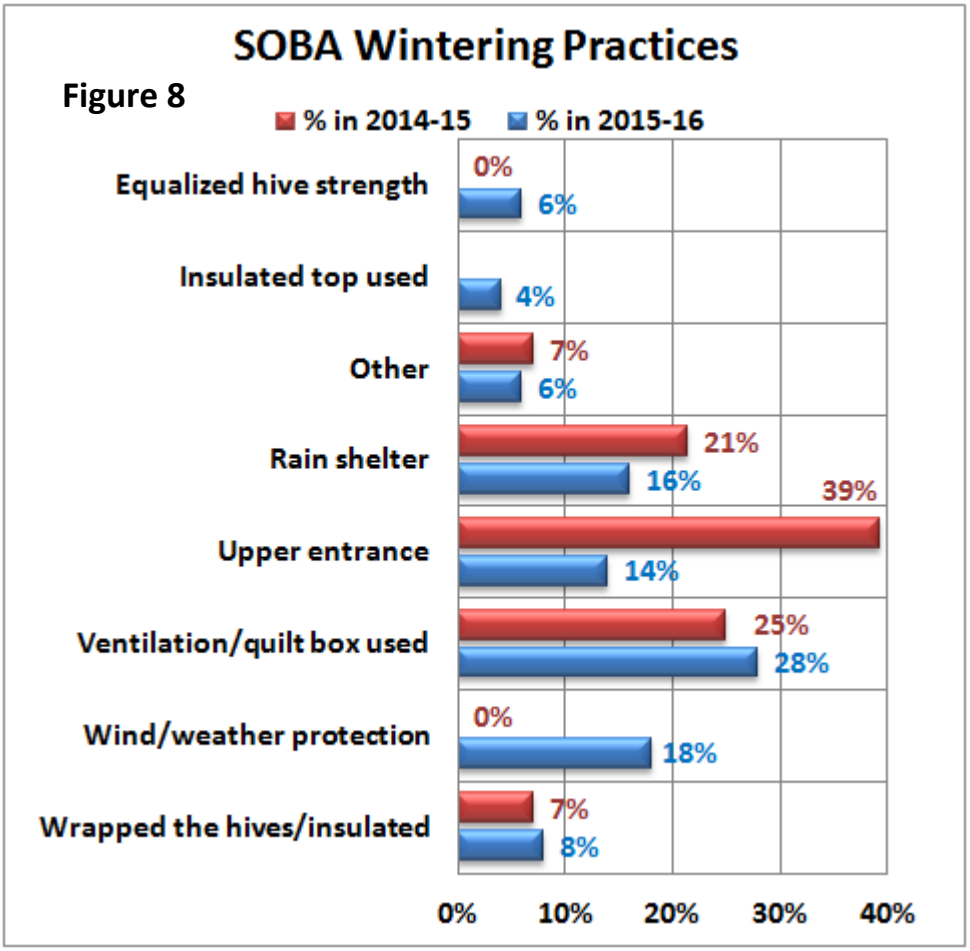
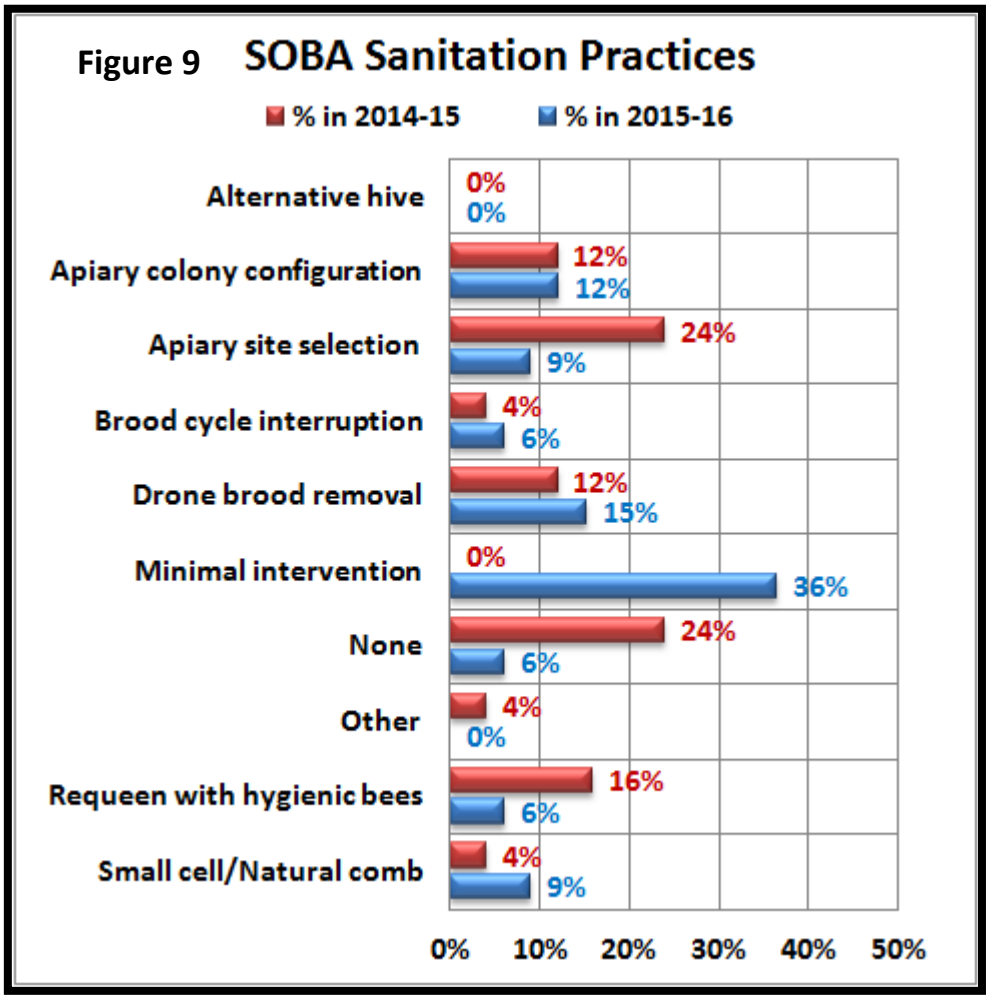
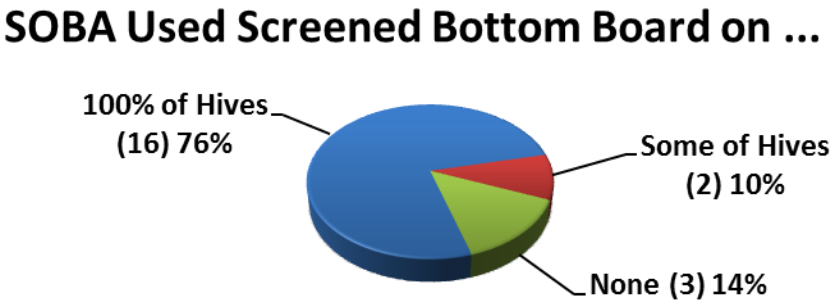


Figure 8

SANITATION PRACTICES: It is critical that we practice some basic sanitation in our bee care. We probably do too little to help insure healthy bees. We received 31 responses for this survey question. Two individuals (6%) said they did not practice any of the 8 offered alternatives. The most common selection was minimal hive intervention (24% of responses); less intervention means less opportunity to compromise sanitation of a hive; needless inspections/manipulations can only interfere with what the bees are doing to stay healthy. As caring bee stewards we should believe we can do our inspections without necessarily compromising bee colony health. Apiary colony configuration and Apiary site selection were other popular choices; together this signifies giving colonies a distinctive "address" which will help reduce movement of bees from one colony to another (close) neighbor. Other choices of note were slightly higher percentage of individuals doing drone brood removal but unfortunately fewer indicated they were requeening with hygienic queens stock. These last two are specific measures to reduce mite numbers. Comparison of past two years shown in Figure 9.



Screen bottom boards: In our national BIP surveys, fully 95% of respondents indicated they have modified colony bottom boards and now use a screen bottom board. We asked what percentage of



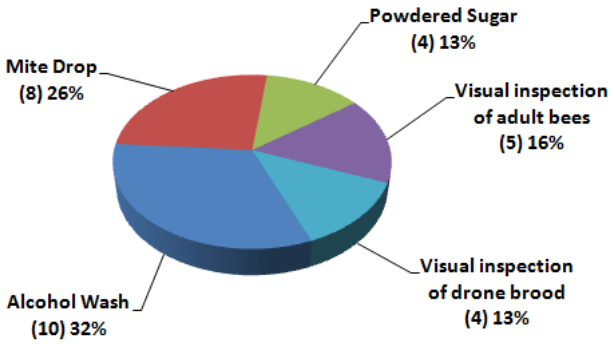
hives had screen bottom boards and whether they were blocked during the winter. Among SOBA members only 3 individuals said they did not use screen bottoms. Statewide, 66% used them on all of their hives while 76% of SOBA beekeepers using Screen bottom boards used on all their hives. The majority statewide (51%) and 49% of southern Oregon beekeepers left them open over the winter period (never response). 18% statewide and 24% in Southern Oregon sometimes blocked them and 31% statewide and 20% of SOBA beekeepers closed them during the winter.

When use of screen bottoms was compared to non-use, there was a 5 pecentage point difference in improved survival overwinter for the 271 beekeeper respondents from Washingon and Oregon. This advantage was the same for our two survey sectons, both directly asking about screen bottom board use or use of SBB as one of the non-chemical alternatives. Losses when left open or closed were not different. It does appear there may be a slight advantage to use of screen bottoms (see www.pnwhoneybeesurvey.com report on screen bottom boards – under reports).

Mite monitoring/sampling and control management

Many believe mites are a major factor in heavy bee losses, especially in their transmission of honey bee viruses. It is important, therefore, to know mite numbers and to seek to keep their numbers low. We asked percentage of hives monitored for mites during 2015 year and the 2015-16 overwinter, whether sampling was pre- or post-treatment or for both pre and post-treatment and by which of the 5 possible sampling methods was that tool used. In order of popularity of use statewide, sticky boards was used by 37% (for SOBA 26%). Sugar shake, visual inspection of adults and drone brood were about the same statewide and within SOBA. Four individuals said they did not monitor. Most sampling was done in July, August, September and October as might be expected.

Figure 11 SOBA Mite Monitoring Method



Individuals who did monitor (for the statewide data base) had an improved survival percentage when their losses were compared to individuals who said they did not monitor. **Pre-treatment can help with control decisions and checking on control effectiveness by post-treatment monitoring is important. Most effective sampling methods are the sugar shake and alcohol wash methods.**

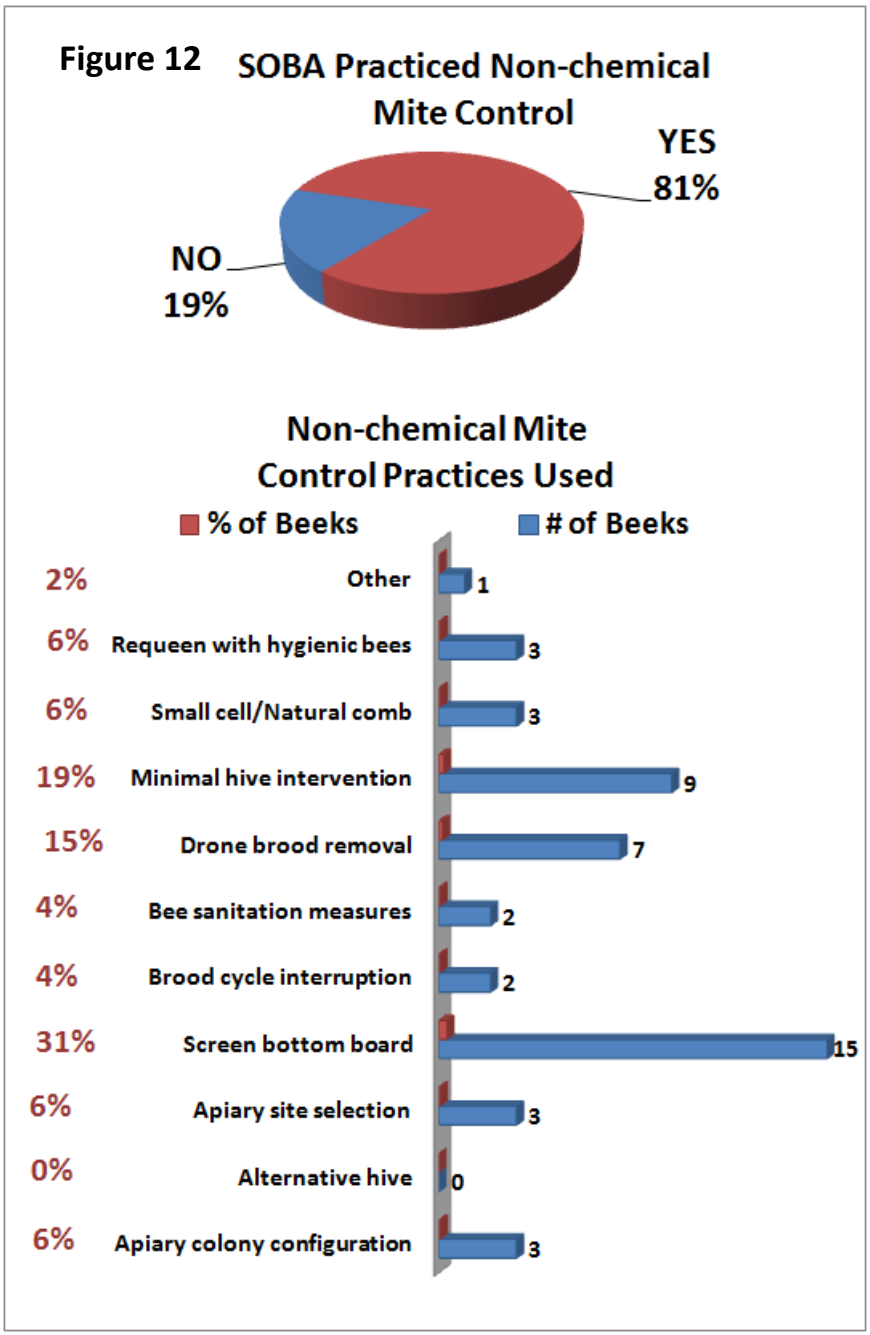
Less effective mite monitoring methods include sticky (detritus) boards below the colony (often so much detritus drops onto a sticky board that picking out the mites can be hard, especially for new beekeepers). Visual sampling is not accurate: most mites are not on the adult bees, but in the brood. Even looking at drone brood is not effective; if done, look at what percentage of drone cells had mites.

See Tools for Varroa Monitoring www.honeybeehealthcoalition.org/varroa on the Honey Bee Health Coalition website for a description of how best to do sugar shake or alcohol wash sampling. The Tools guide also includes suggested mite levels based on the adult bee sampling. A colony is holding its own against mites if the mite sample is below 2% in spring (i.e. 2 mites/100 adult bees) and below 5% (no more than 5 mites to 100 adults) later in the year.

Use of medications and control treatments

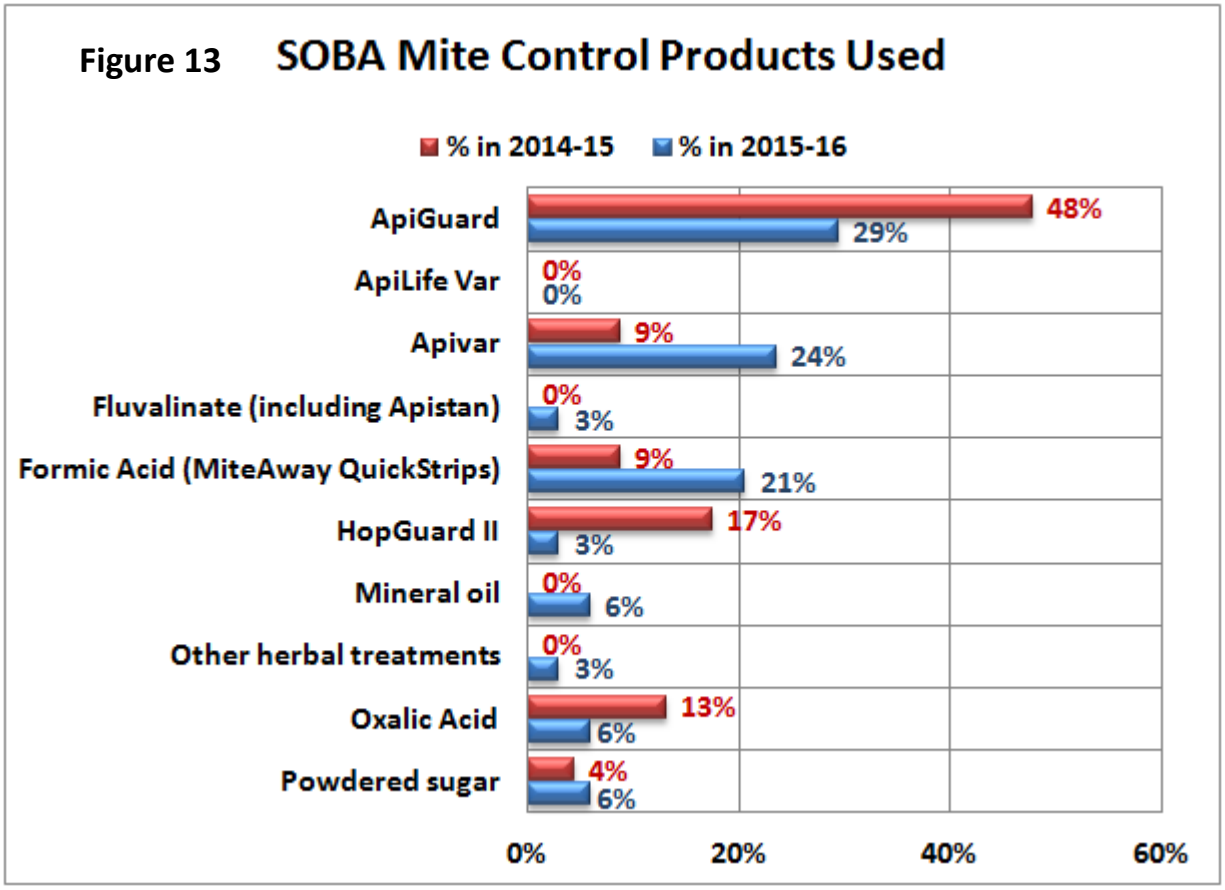
Non-Chemical control: We asked about general mite treatments and also about use of chemicals for mite control. Under general controls, 19% said they did not use any of the 9 alternatives. The remaining 8 selections are shown below in Figure 10 by number of individuals and percent. Screen bottom boards and minimal hive inspection were the two most common managements indicated. Numbers are too low to permit analysis; see next paragraph for analysis of the larger database.

For the larger data base of 219 Oregon beekeepers, 80 individuals (42%) checked a single selection, while 61 individuals indicated 2 selections, 22 individuals checked 3 alternatives; 12% chose 4 or more of which 2 indicated 8 alternatives. Among the alternative selections, Screen bottom board use was indicated by 38% of respondents; their loss rate was 37%, a slight improvement over the base loss rate of 40%. The selection of Minimal hive intervention resulted in loss rate of 47%. Those who indicated use of apiary colony configuration, apiary site selection and alternative hive (15% of respondents) had a loss rate of 41% The highly interventive managements of requeen with hygienic bees, drone brood removal and brood cycle interruption (collectively 19% of respondents) had a loss rate of 34%, 6 percentage points better survival. These managements and to a lesser degree use of screen bottom boards were the alternatives that provided the better survival rates.



Chemical control: Four SOBA individuals said they did not use any of the chemicals. Apiguard (essential oil thymol) Apivar (amitraz) and MAQS (formic acid) were the most commonly used materials. Comparison of chemical use of last two seasons shown in Figure 13.

Figure 13 SOBA Mite Control Products Used



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. A chemical is 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 Hopguard 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.

Among the 219 Oregon survey respondents, 89 individuals indicated they did not use any chemical controls; they had a loss rate of 59%. Apivar, the synthetic amitraz chemical, was used by 43 individuals and they had a much better survival rate with only a 23% loss rate. Twenty one individuals used ONLY Apivar, 15 used 2 chemical materials, 5 used 3 chemicals and 1 each used 4 & 5 chemicals. MAQS (Formic acid) was used by 42 individuals who also had a significantly better survival rate with a lost rate of 23%; among the 42 individuals, 17 used ONLY MAQS, 16 used 2 chemicals, 9 individuals used 3 and 1 each used 4 & 5 chemicals.

The essential oil Apiguard was used by 32 individuals and they had a 26% loss; 14 individuals used ONLY Apiguard, 10 used 2 chemicals, 7 used 3 and 1 used 5 chemicals. Oxalic acid was used by 30 individuals; they had a loss rate of 35%; 7 of these individuals used ONLY Oxalic acid, 15 used 2 chemicals, 7 used 3 and 1 used 4. Powdered sugar was the chemical choice of 16 individuals; their loss rate was 29% for the 16 individuals, 7 used ONLY PS, 2 chemicals were used by 3 individuals and 4 used 5 chemicals.

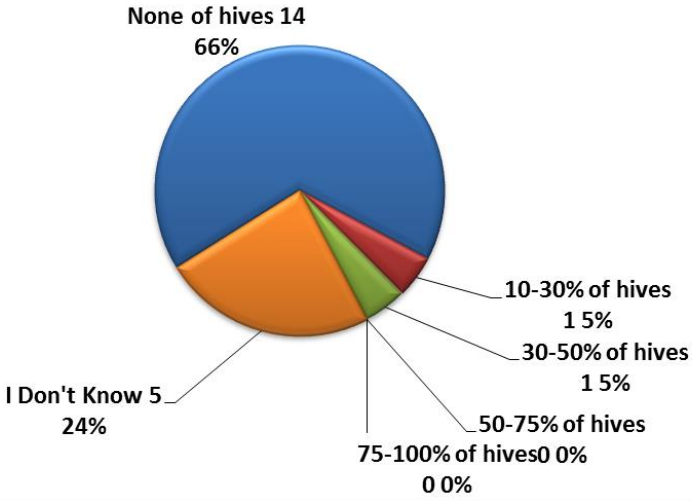
Thus chemical use rather clearly improved overwintering of Oregon beekeepers. Significant numbers of individuals used more than one chemical. How such integration of chemicals with non-chemical alternatives or mixing of different chemicals needs to be more clearly determined. It is important to follow label directions. Consult Tools for Varroa Management from Honey Bee Health Coalition, available for free download from OSBA website or www.honeybeehealthcoaltion.org/varroa.

Six individuals of 144 that responded statewide (4%) indicated they treated with terramycin for foulbrood disease, none from SOBA. Thirty individuals (21%) indicated use of Fumigillin for Nosema disease control, with two SOBA members using it and another two indicating use of nosevet.

QUEENS

We hear lots of issues about queens and queen failure. A queen event can seriously interfere with colony survival. Generally we are not satisfied with our questions about queens on this year's survey. We asked what percentage of colonies lost died because of queen problems. 14 SOBA individuals said none and 5 indicated they didn't know. Numbers are shown with percent of responses in Figure 14.

Figure 14 **SOBA Percentage of Colonies Lost From Queen Related Issues**

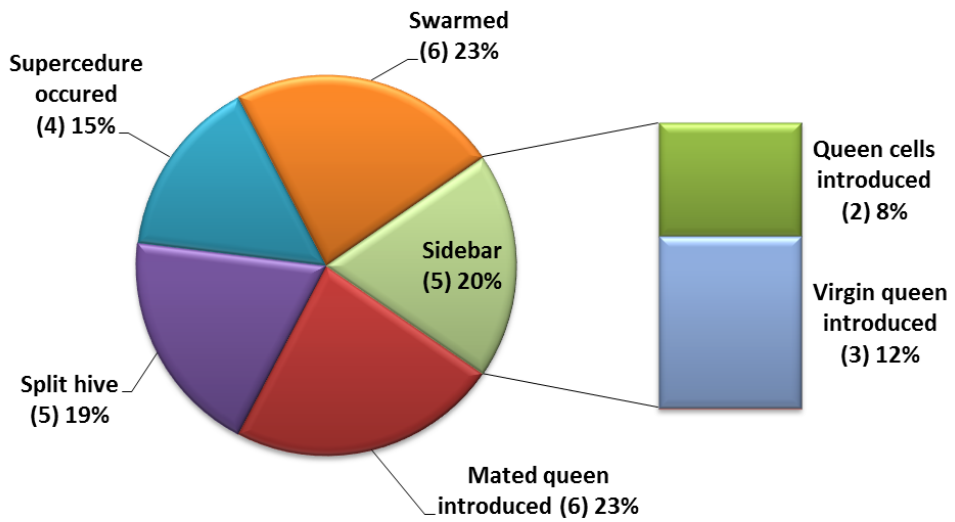


Our subsequent question asked "Did you, or did your hive requeen, in any form during the year". Of 21 responses, 6 (29%) said no, 6 said 'Not that they were aware of' (14%) and 12 (57%) responded yes. 43% said they had marked queens.

There were 21 responses to the question" If you did requeen, how did you do it." There were ten that indicated requeening was via swarming and supersedure. Five said split hive and six said they introduced a mate queen. Fifty one individuals in OR and WA indicated they reared 150 local queens via splitting/grafting or other method. Three-fifths survived winter. Three southern Oregon beekeepers raised 7 queens locally and all 7 survived the winter.

Queen stock is a key to eventually not having to do constant mite control. Among notable local queen breeders Old Sol has been working on finding bees better suited for the local habitat. WSU and the USDA lab in Louisiana have significant efforts underway seeking bees that are more mite tolerant/resistant. Russian bees have better ability to resist mites as does proven hygienic stock. WSU's program with imported semen is yielding bees with improved hygienic behavior to remove mites. Mixing local stock with hygienic stock seems to be working.

Figure 15 **SOBA Requeening Method**



Summary

As indicated we will further continue to 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 available on the BeeInformed website (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 KBBA and SOBA Members who participated – if you find any of this information of value please consider adding your voice to the survey in a subsequent season.