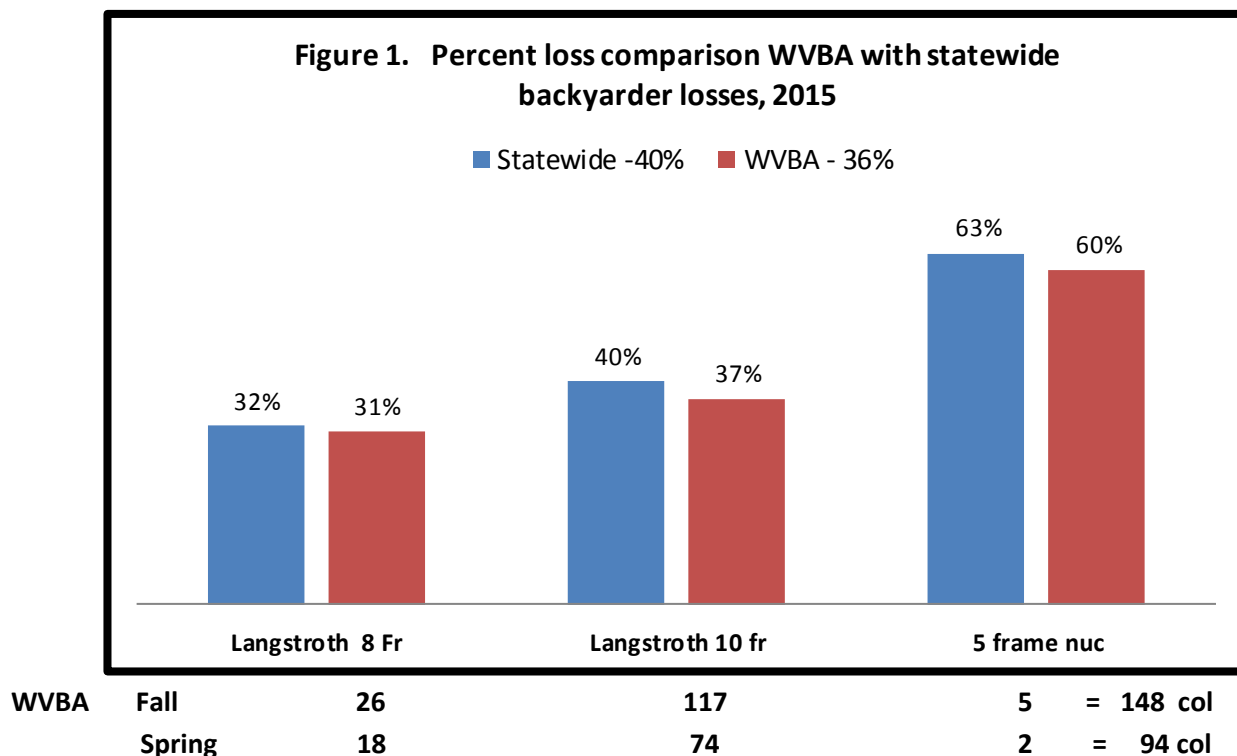


2015 WVBA Winter LOSS by Dewey M. Caron with statistical assistance of Jenai Fitzpatrick

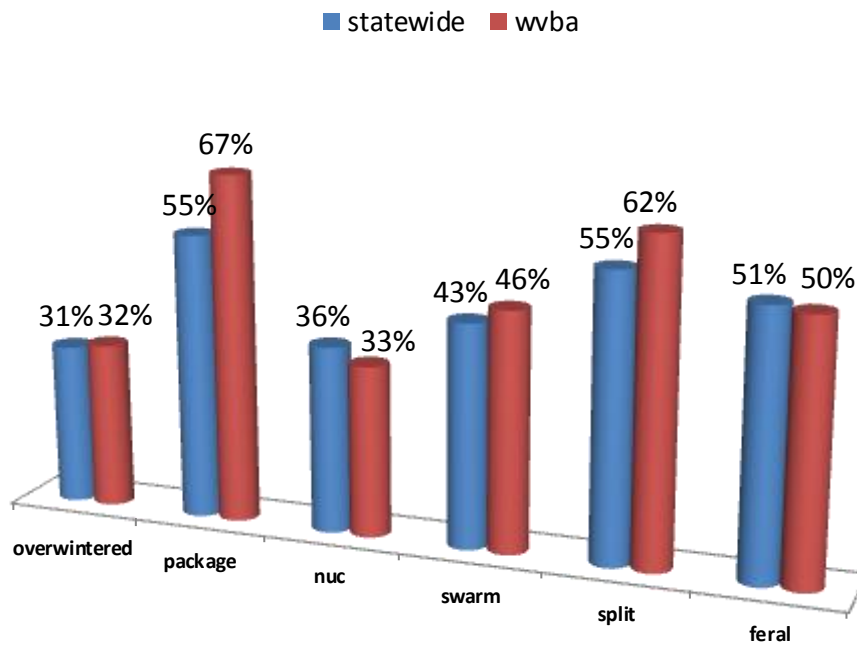
At the March and April WVBA meetings I distributed paper copies and directed members to a web-based survey document as a continuing effort to define overwintering success. This was the 8th year of such survey activity. I received 219 responses from OR backyarders, keeping anywhere from 1 to 50 colonies; Willamette Valley members sent in 28 surveys, 6 more than previous year survey; colony numbers were slightly higher (144 vs 140 last year).

Overwintering losses of WVBA respondents was 54 colonies = 36%, slightly lower than the statewide loss of 40% (database of 219 OR backyarders.) Percent losses, determined for Langstroth hive types, are shown in Figure 1 comparing WVBA with the statewide backyarders. WVBA member respondents started winter with 117 Langstroth 10-frame and 26 Langstroth 8-frame hives and 5 5-frame nucs; no Top bar nor Warré hives were reported; a single non-traditional hive (described as gas tank hive) was reported and it survived the winter. Loss of Langstroth hives was essentially the same as statewide.



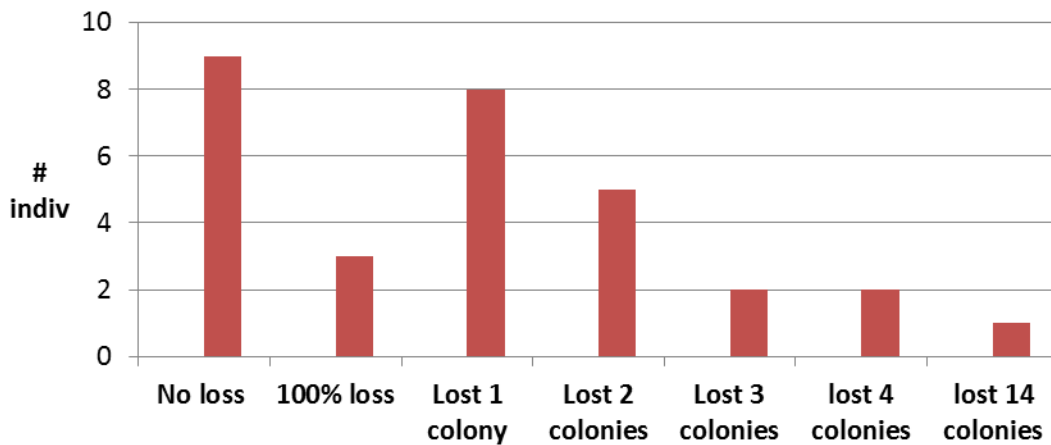
The survey also asked for hive loss by hive origination. Forty-four of 65 overwintered WVBA colonies were alive in the spring (32% loss rate). Respondents reported very similar loss levels of newly established colonies, packages (only 6 reported by WVBA beekeepers), nucs (22 of 33 survived), swarm captures and feral transfers (only 4 of which 2 survived) to the statewide Oregon beekeepers.

Figure 2. Percent Winter loss by hive origination, WVBA and statewide, 2015



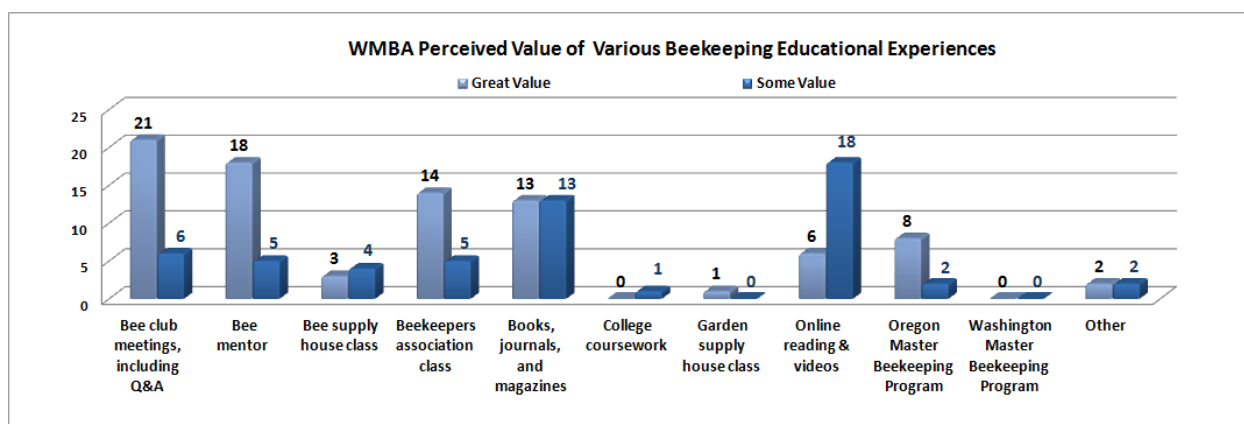
Not everyone had loss. Nine individuals (32%) reported total winter survival; 3 individuals lost 100% of their colonies. Eight individuals lost 1 colony, 51 lost 2, 2 each lost 3 and 4 colonies; one individual lost 14 colonies the heaviest loss. Data shown graphically below in Figure 3. Seventy-two percent indicated acceptable overwinter loss as zero or 5-15%.

Figure 3. 2015 WVBA individual loss, hive ownership



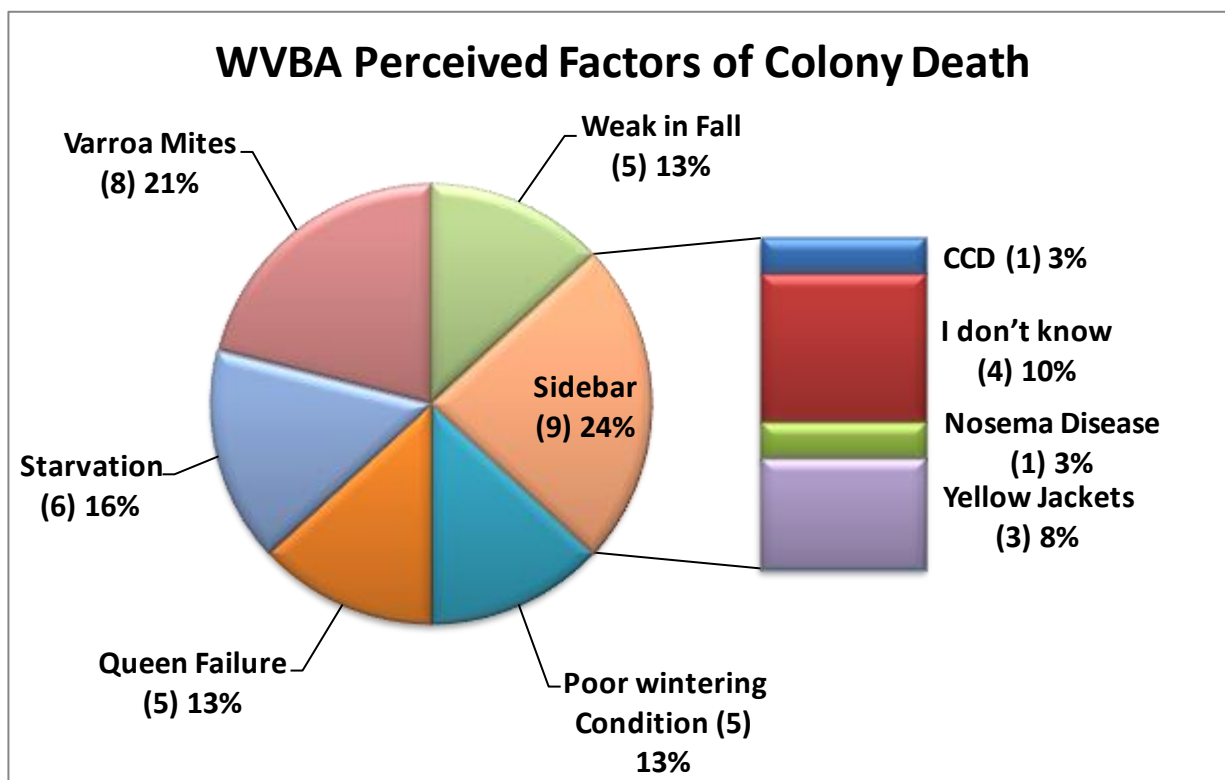
Typical of the statewide data the WVA respondents are largely new beekeepers. 73% of WVBA respondents keep 1, 2 or 3 colonies; the largest number was 20. 56% had 1, 2 or 3 years of experience but 20% had 8 or more years experience with 38 years the longest. Five individuals had more than one apiary location. Four individuals moved bees during the year, one for pollination, one due to neighbor conflict and 2 to reduce number at one site.

When asked to indicate where the majority of their beekeeping education was received, WVBA respondent numbers indicted club meetings, bee mentor, the Association class and Books, journals and magazines of greatest value. Books, journals and magazines plus online readings and videos were those indicated of some value. Response information graphically in Figure 4. All but a single WVBA respondent said they had a mentor available as they were learning beekeeping; statewide 69% said they had a mentor.



We asked for individuals that had colony loss to estimate what the reason might have been. Varroa mites (8 individuals) and starvation closely followed by queen failure and weak in fall (5 individuals) were the top choices. I don't know and yellow jackets (3 individuals) were also indicated. Responses by WVBA beekeepers closely follow statewide responses. See Figure 5.

When asked opinion as to an acceptable loss, 8 individuals said zero, 6 checked 10%, 7 indicated 15-25%, 2 said 33%, 3 50% and 1 said 75%, a large range of opinion.



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 alteration to the bee's natural environment and other external factors play in colony losses are not at all clear.

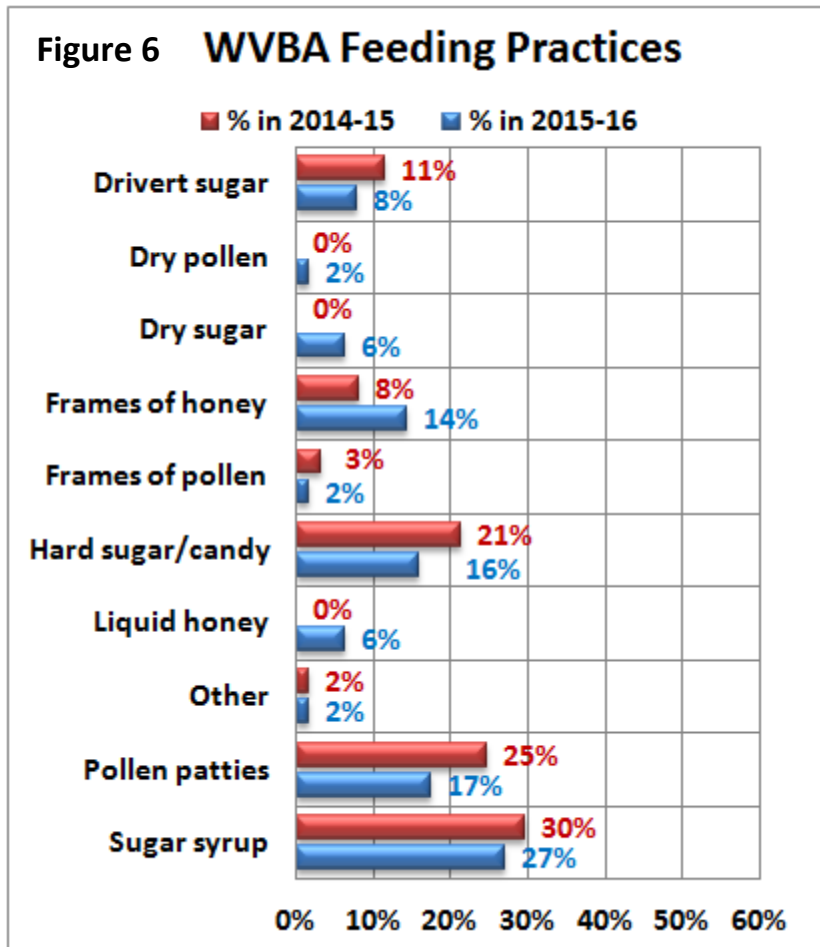
Langstroth wrote about the importance of taking losses in fall management saying if the beekeeper neglects such attention to his/her colonies 45% loss levels may occur, depending upon variable environmental conditions. It can be argued that losses of 30, 40, 50% or more might be "normal." Older, more 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

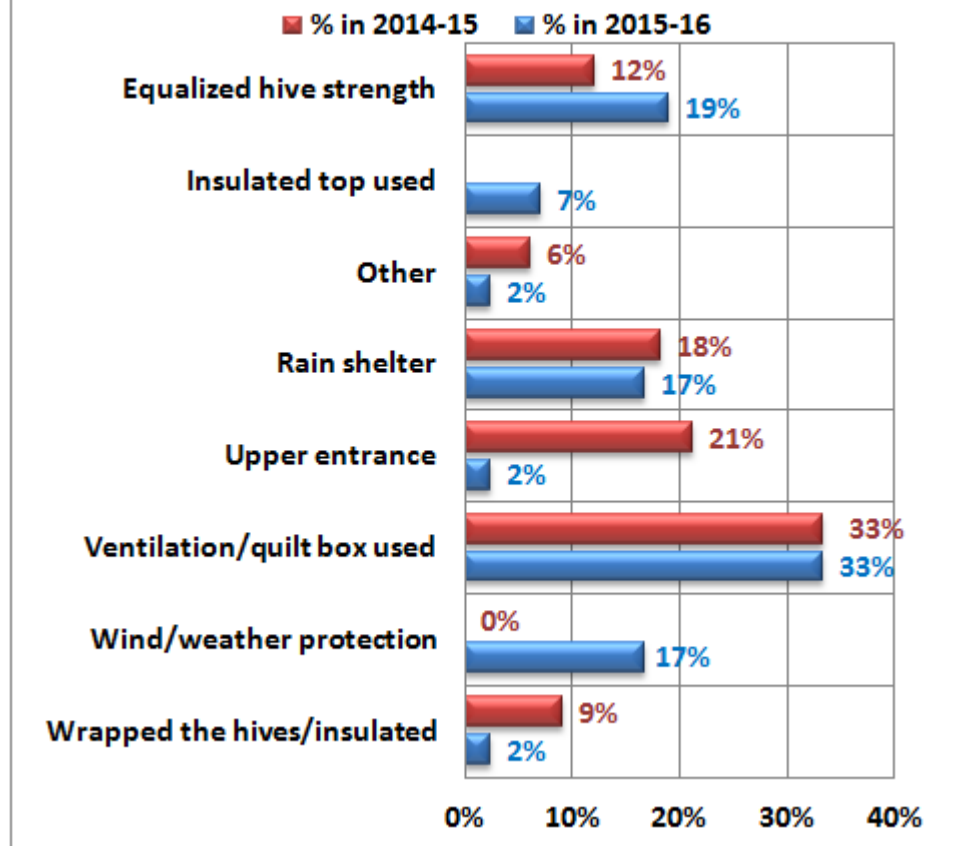
We asked in the survey for information about some managements practiced by respondents. Multiple responses were encouraged.

Feedings: A comparison of feeding practiced by WVBA member the past two years is shown in bar graph. Two individuals (8% of total) did not do any of the options offered. Sugar syrup (33%) and pollen patties (20%) followed by feeding a hard sugar/candy or frames of honey. These were the top 4 statewide selections as well. There was little variation between the two years.

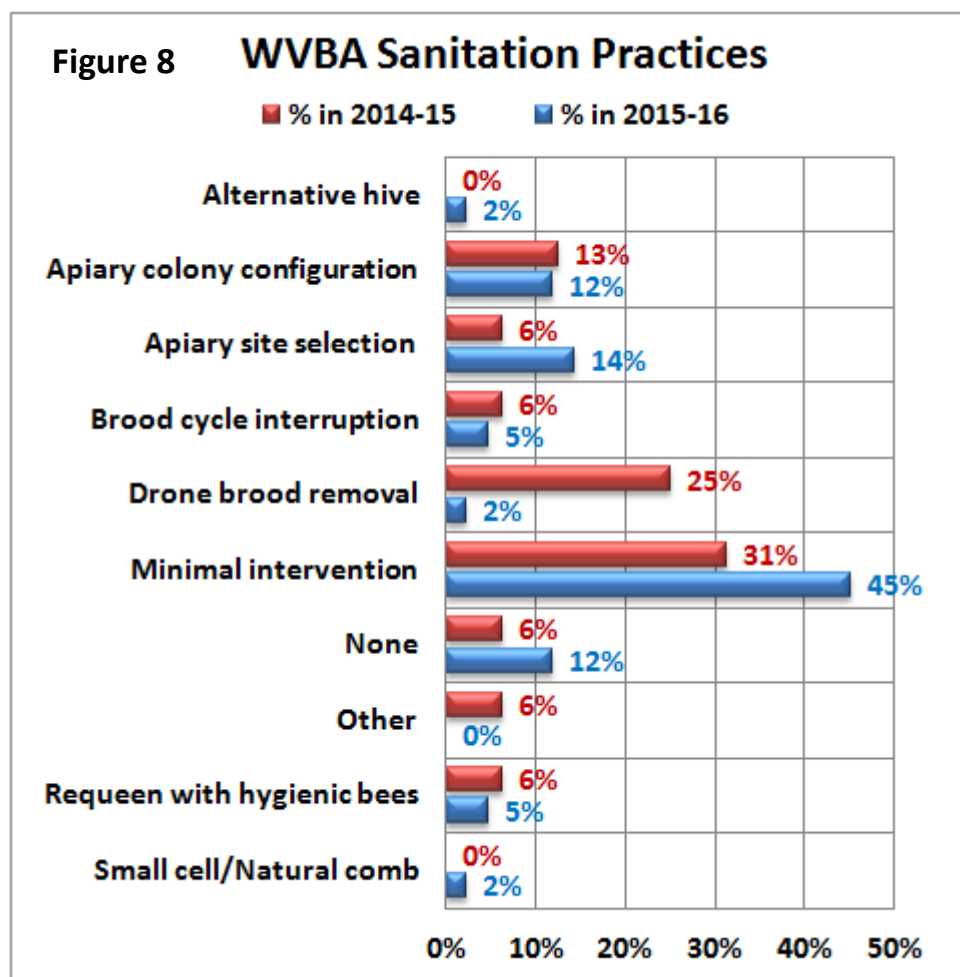


WINTERING PRACTICES: We received 46 responses about wintering management practices from WVBA members (more than one option could be chosen). Four individuals (14%) of WVBA respondents indicated none of the several listed wintering practices was done. The most common wintering management selected was ventilation/use of a quilt box/lid insulation (33% of responses in both of last 2 years). Equalizing hive strength and use of a rain shelter were next most common. Use of a wind/weather shelter was an addition this year to survey responses; some of the other selections in 2014-15 were this management. The other this year was use of entrance reducer.

Figure 7 WVBA Wintering Practices

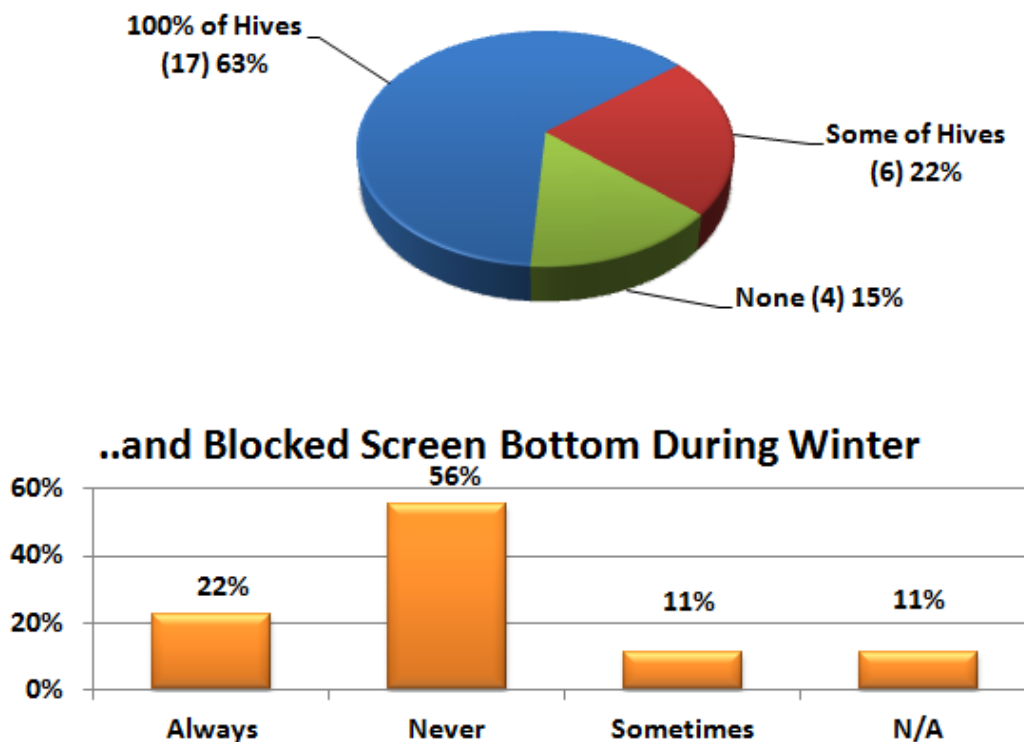


SANITATION PRACTICES: It is critical that we practice some basic sanitation in our bee care. We probably do too little to help insure healthy bees. We received 37 responses with 19 of them being minimal hive inspection for this survey question. Five individuals (18%) said they did not use any of these practices. This group had a loss rate of 33%; the 19 individual that used minimal hive intervention had a loss rate of 37%. 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 so we should believe we can do our inspections without necessarily compromising bee colony health. It apparently does not make a difference, at least in reducing winter losses.



Screen bottom boards: In our national BIP surveys, fully 95% of respondents indicate 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 WVBA members only 4 individuals (14%); 63% said they used them on all their hives while 56% of those using Screen bottom boards in WVBA County using on all their hives. Loss rate for those not using the SBB was 40% while those who did use a SBB had a 36% loss. This same small advantage of SBB use also occurred with the 219 Oregon beekeepers – a 5 percentage points advantage.

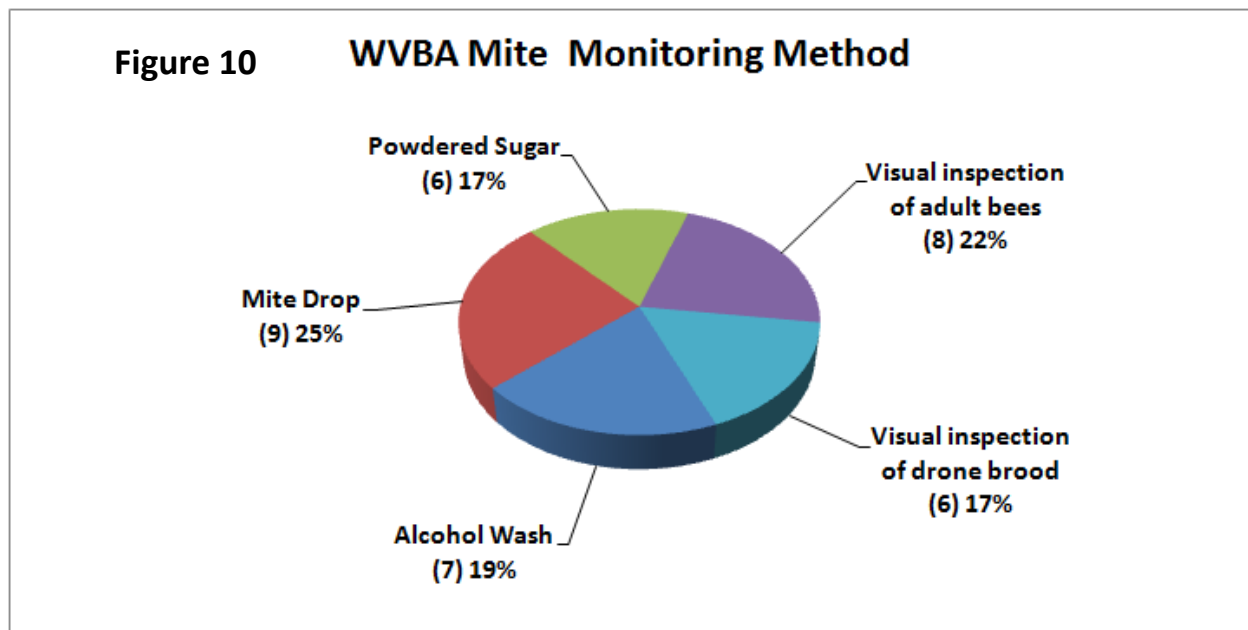
Figure 9 WVBA Used Screened Bottom Board on ...



Things that seem to improve winter success: It should be emphasized that these comparisons are correlations not causation. They are single comparisons of one item with loss numbers but individuals do not do only one management option nor do they necessarily do the same thing to all the colonies in their care. We do know moisture kills bees, not cold, so we recommend hives be located out of the wind, in the sun, and when exposed providing some extra wind/weather protection might improve survival. Leave screened bottom boards open and insure a top ventilation. Use of screen tops/quilt box with moisture collector such as burlap, straw, old towels, etc with extra top ventilation to vent the moisture is also good idea. Feed bees either sugar syrup or honey from other hives to insure enough food stores in fall management. Once fall rains start. feed dry sugar or as a hard candy to avoid adding additional moisture stress to colonies. Finally, It would seem prudent to review basic sanitation measures as anything we can do to help reduce sick bees and improve colony health will improve overall survival.

Mite monitoring/sampling and control management

We asked percentage of hives monitored for mites during the 2014 year and/or 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 (See Figure 10). All the sampling methods were used by WVBA members to about the same extent. Most sampling was done in August September and October as might be expected (data not shown).

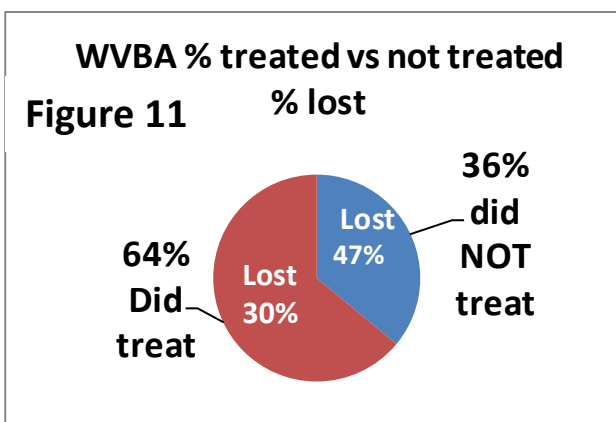


It is important to KNOW mite numbers. Less effective mite monitoring methods include sticky (detritus) boards below the colony (often so much detritus drops onto a sticky board that picking out the mites can be hard, especially for new beekeepers). Visual sampling is not accurate: most mites are not 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 control treatments

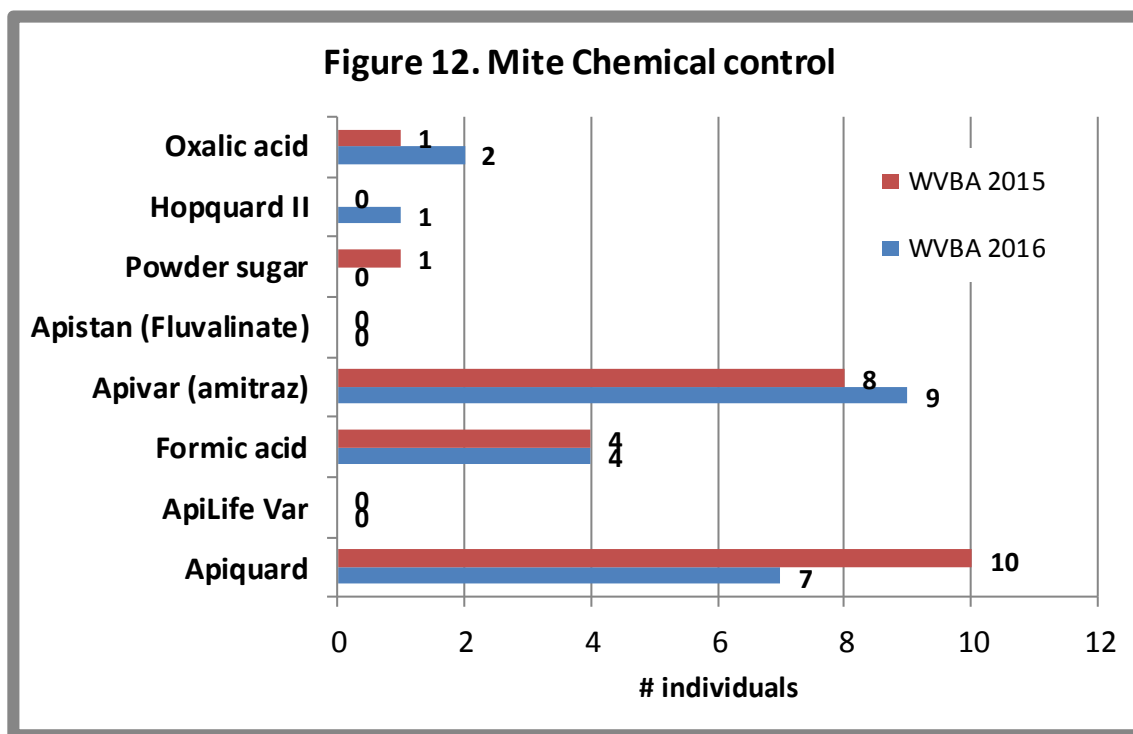
Non-Chemical control: We asked about general mite treatments and also about use of chemicals for mite control. Eighteen WVBA individuals (64%) said they treated for mites, slightly greater than the 57% of Oregon beekeepers who performed some treatment. The individuals that did some treatment had a 30% loss while those individuals indicating they did no treatment had a 47% loss. For the 219 Oregon beekeepers who did use a treatment, there was a 32.7% winter loss while those who did NOT had double that number, a 67.4% loss rate. Non-treatment may be by default, a decision based on sampling results or beekeeper philosophy but it is obvious that some treatment, even those that are less effective, improves colony winter survivability.



Under non-chemical controls, 21% (6 individuals) said none of the 9 alternatives was used; this individuals had a 36% loss the same as the overall loss level. For the respondents statewide who checked at least one (more than one selection was permitted), minimal hive interruption and screen bottom board use were the two most common selections. The remaining selections are shown in table below.

Apiary colony configuration	4	8%
Alternative hive	1	2%
Apiary site selection	5	10%
Screen bottom board	13	27%
Brood cycle interruption	2	4%
Bee sanitation measures	4	8%
Drone brood removal	3	6%
Minimal hive intervention	11	23%
Small cell/Natural comb	3	6%
Requeen with hygienic bees	1	2%
Other	1	2%

Chemical control: For chemical control there were 23 WVBA responses. Nine individuals said they used none of the choices: they had a loss rate of 47%. The most common selection was Apivar (9 individuals with 7 using only this chemical, had only a 28% loss. The seven individuals who used this chemical alone, 3 used in combination (Oxalic and Formic acids) had a 31% loss, again an improvement in survivorship over none use of a chemical. Formic acid use (4 individuals, 2 using only this treatment chemical) had a 27% loss rate. Comparison of chemical choices the last two seasons shown in Figure 12.



Use of a chemical control was most significant in improving winter survivorship. The improvement in survivorship of WVBA members was similar to the 219 Oregon beekeepers who used chemical controls. 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 also very helpful for improving survivorship. MAQS was used by 42 individuals and they too had only a 23% loss rate. 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. Even use of Powdered sugar decreased loss. Powdered sugar was the chemical choice of 16 individuals; the loss rate was 29% of the 16 individuals, 7 used ONLY PS, 2 chemicals were used by 3 individuals and 4 used 5 chemicals.

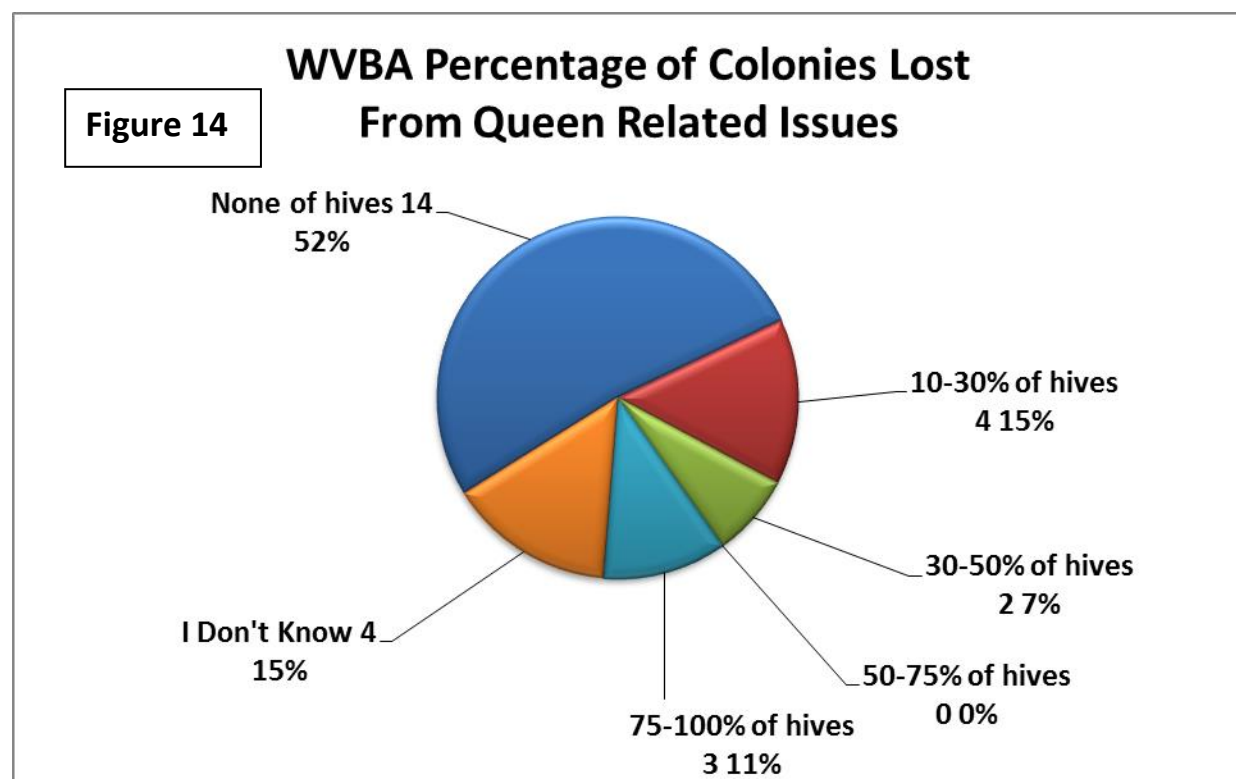
See website for two reports for more details on the treatments for varroa.
<http://pnwhoneybeesurvey.com/survey-results/2015-16-survey-reports/>

Six individuals of 219 that responded statewide indicated they treated with terramycin for foulbrood disease, none in WVBA. Eighteen individuals (21%) indicated use of Fumigillin for Nosema disease control, 5 in WVBA. Three in state used Nosevet; one in WVBA.

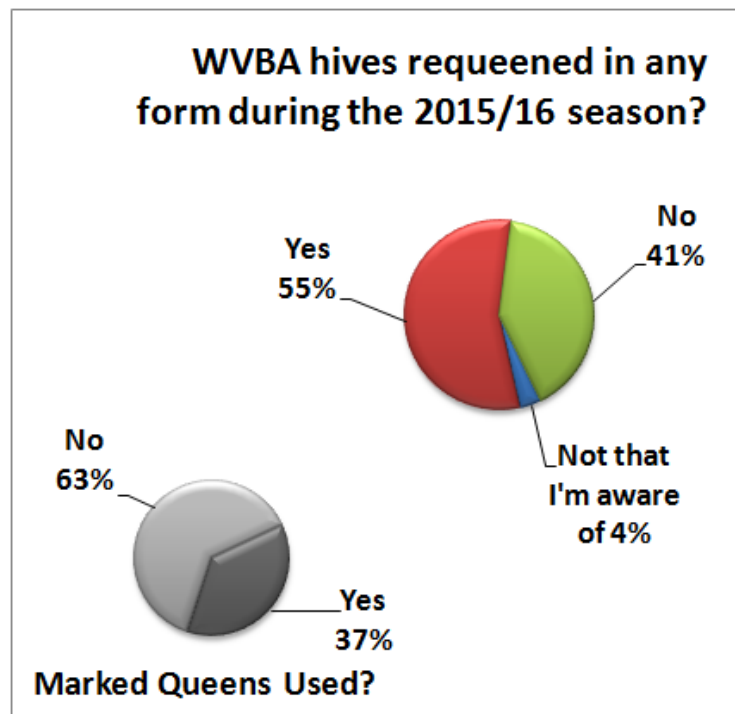


Queens, Queens Queens

We are not satisfied with our questions about queens on this year's survey. We asked what percentage of your colonies lost do you feel died because of queen problems. None response was followed by 9 who said anywhere from 10 to 100%. I don't know was response of four individuals. Responses shown in Figure 14 below.



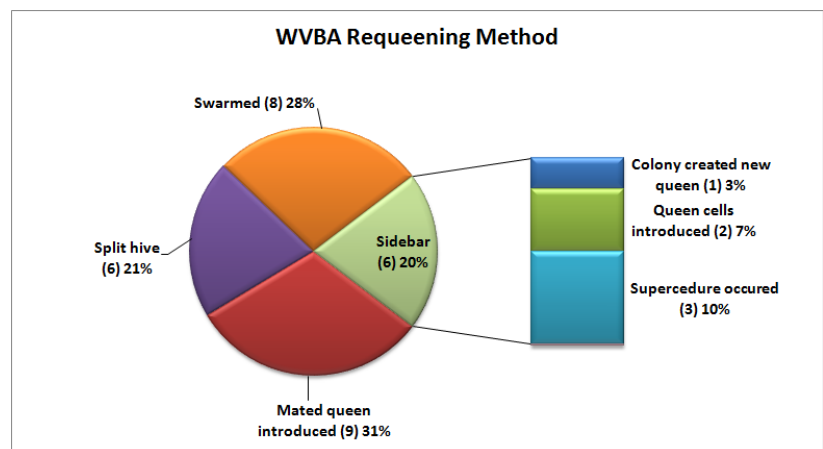
Our subsequent questions asked “Did you, or did your hive requeen, in any form during the year”. 55% said yes and 41% no. We asked if queens were marked. Only 37% said yes. Outside of the beekeeper requeening a colony, it would be difficult to say yes or no to question about colony requeening in the absence of queen marking.



Twenty nine individuals responded to the question “If you did requeen, how did you do it.” The largest response was mated queen introduced (31%) followed by colony swarmed (28%). We asked if queens were marked. Only 28% said yes.

Outside of the beekeeper requeening a colony, it would be difficult to say yes or no to question about colony requeening in the absence of queen marking.

Six individuals in WVBA indicated they reared 14 local queens and 5 survived the winter. Local survivor stock may have some value in reducing mite populations



Summary

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 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 WVBA Members who participated – if you find any of this information of value please consider adding your voice to the survey in a subsequent season.