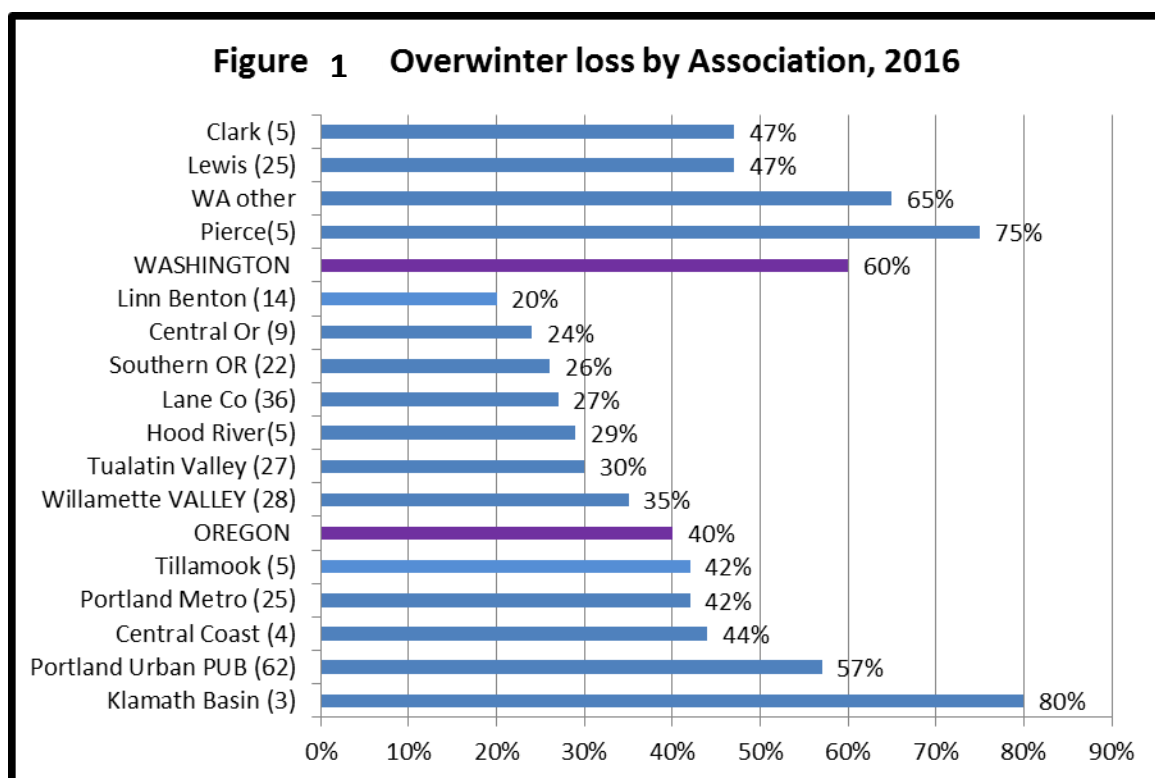


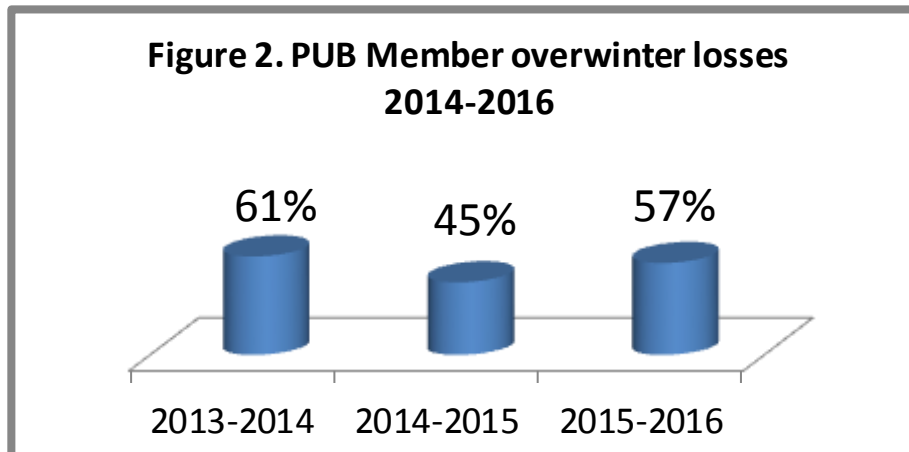
2015 PUB Winter Loss by Dewey M. Caron and Jenai Fitzpatrick

Overwintering losses of small scale Oregon backyard beekeepers in PUB was elevated 12 percent in 2015-2016, compared with the previous season, 2014-2015. During the 2015-2016 overwintering period, 62 members supplied information on winter losses and several managements related to bee health with an electronic honey bee survey instrument developed within the PUB bee group www.pnwhoneybeesurvey.com.

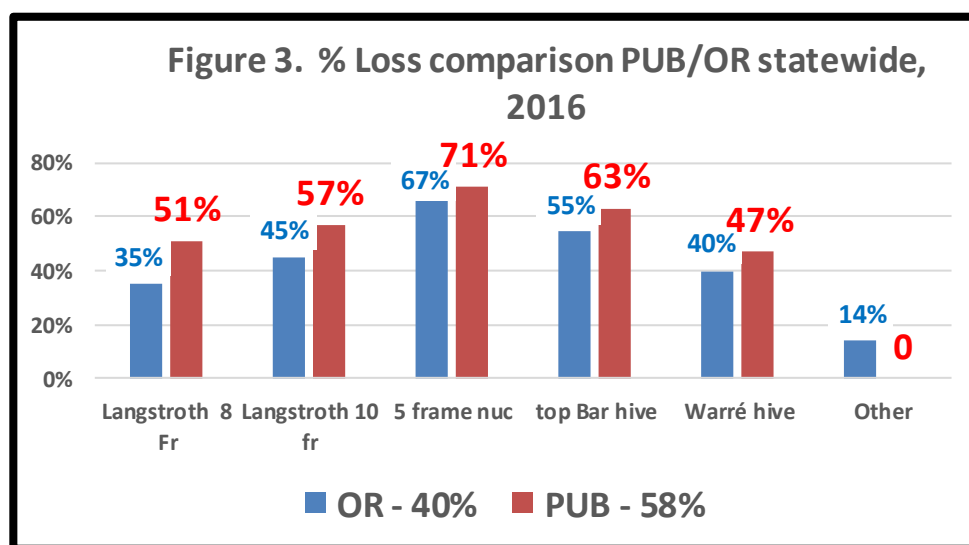
The PUB member response was the largest of 14 Oregon bee associations. A total of 271 PNW (249 OR, 52 WA beekeepers) responses were analyzed with the 2015-2016 survey. The PUB group, with addition of followers and guests includes 3 more member responses than last year (see website for 2015 report).



Total overwintering losses of PUB respondents was 57%, which was 42% greater than the statewide loss of 40% (database of 249 OR backyarders). PUB loss rate was the highest of OR associations, except for the 3 individual Klamath Basin beekeepers. This loss, while greater than last year is 3 percentage points below the heaviest loss level of the 2013-2014 season. See figure 2 next page. It is the 2nd consecutive year that PUB had the heaviest colony loss rate of associations with 20 or more respondents. **Why PUB members have continuing heavy overwinter losses is not known** – they have been the highest for our three survey years. This survey is designed to document losses and to help find answers for such losses.

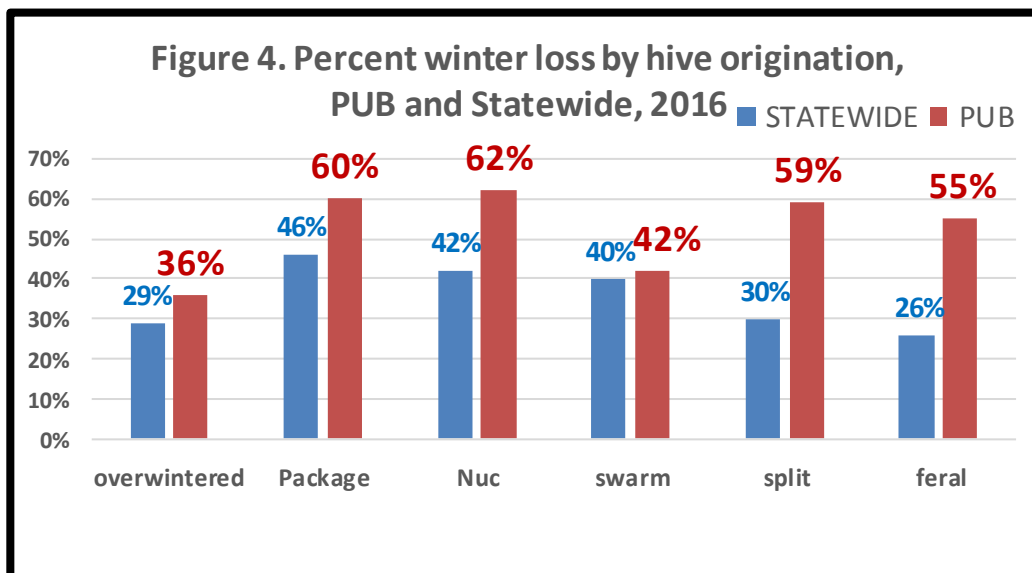


Loss statistics were based on response to question on winter loss by hive type. Categories included 8 and 10 frame Langstroth hives, 5-frame nucs, Top Bar hives, Warré hives and a category other hive types. PUB member respondents started winter with 101 Langstroth 10-frame hives and 35 Langstroth 8-frame hives (72% of total of PUB hives), 7 nucs (5-frame), 15 Warré hives (65% of OR Warré hives) and 30 Top bar hives (56% of total reported by OR respondents). Figure 3 illustrates that **loss rate of 5-frame nucs and top bar hives was heaviest**, both among OR and PUB beekeepers and PUB member losses were heavier in all 5 hive type categories – there were no “other” hives reported by PUB members responding to the survey. PUB losses, although higher, were proportionally similar to overall OR losses by hive type for the statewide survey results.



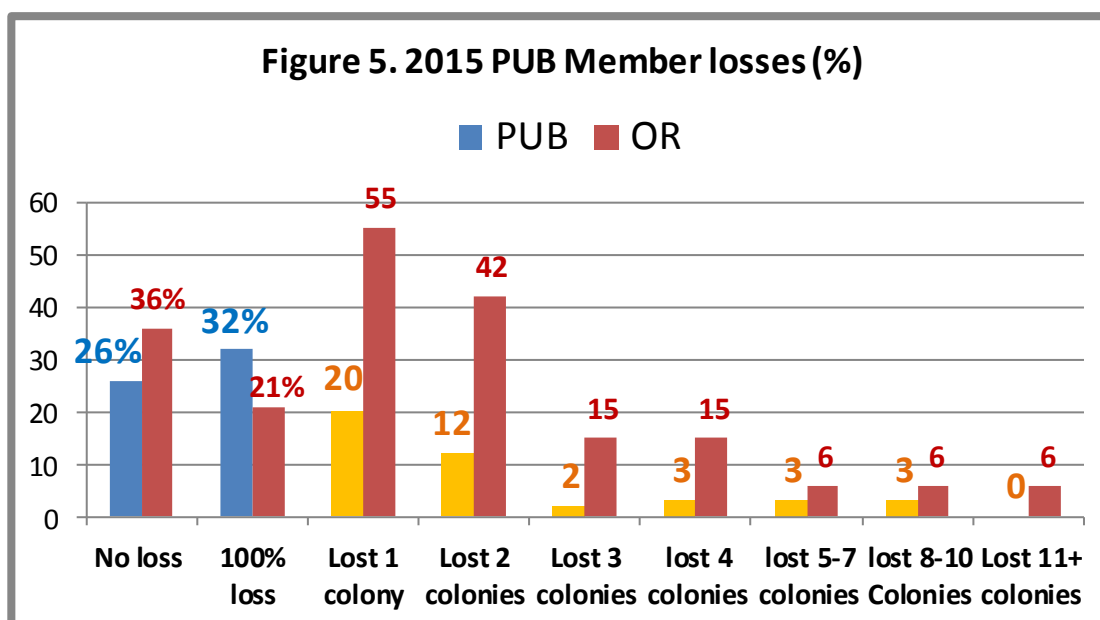
The survey also asked for **loss by hive origination**. Forty-three of the 67 overwintered PUB member colonies were alive in the spring (36% loss rate), a slightly higher loss rate

compared to statewide (29%) overwintering colony loss rate. Respondents reported losses exceeding 50% for package bees (60%), nuc installations (62%), splits (59%) and feral hive transfers (55%). There was a slightly lower loss of swarm hive (42%). See Figure 4.



PUB respondents mostly keep 1, 2 or 3 colonies (77%); the largest number was 23. Seven individuals (11%) have more than one apiary location. Seven individuals said they moved bees during the year; two moved a hive to a friend's place, two needed to move due to "neighbor issues", one to a new residence and one who indicated the primary apiary had too many colonies. One did not offer an explanation.

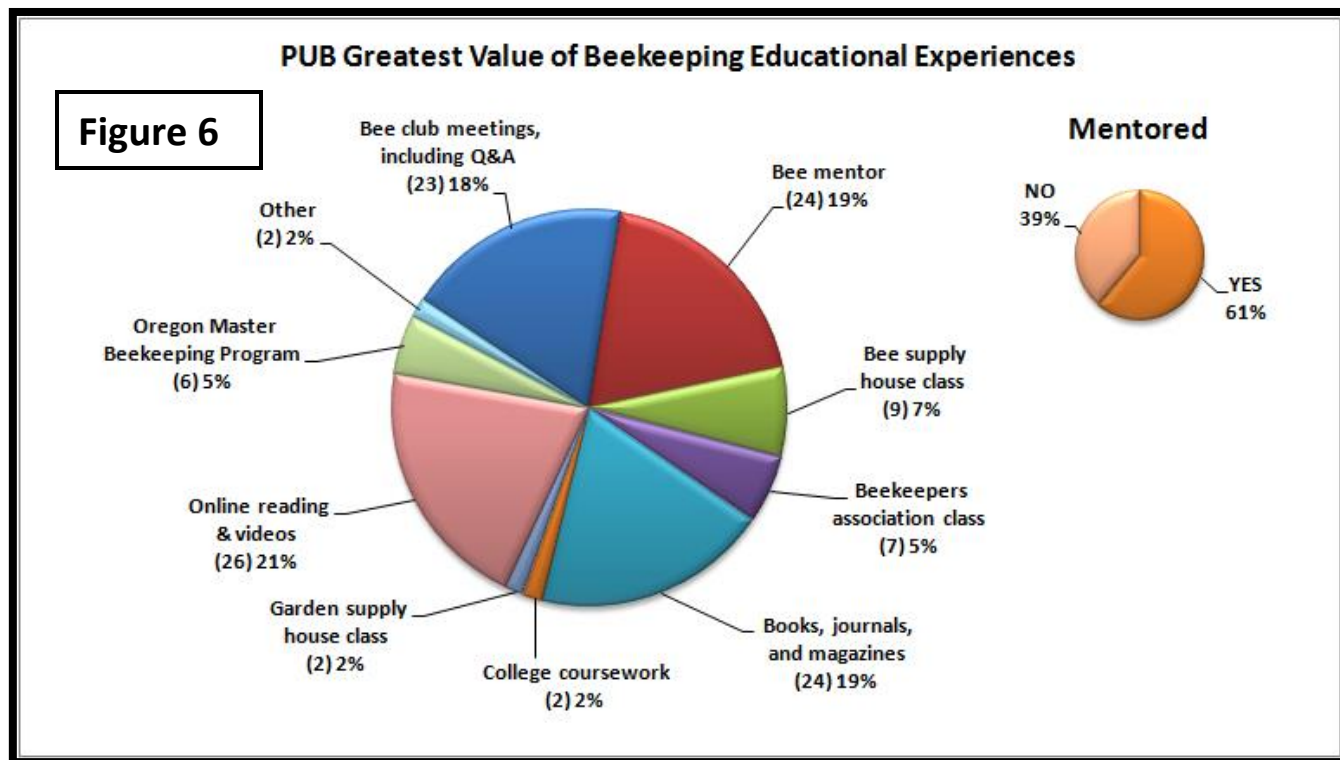
Not everyone had loss. **Sixteen PUB individuals (26%) reported total winter survival**



compared to 36% statewide; **a third of PUB members lost 100% of their colonies**, 11 percentage points higher than the OR statewide number. Seventy five percent (75%) lost 1 or 2 colonies, with heaviest loss 10 colonies (16 colonies was highest loss by any one individual in OR). Data shown graphically comparing PUB losses to OR statewide above in Figure 5.

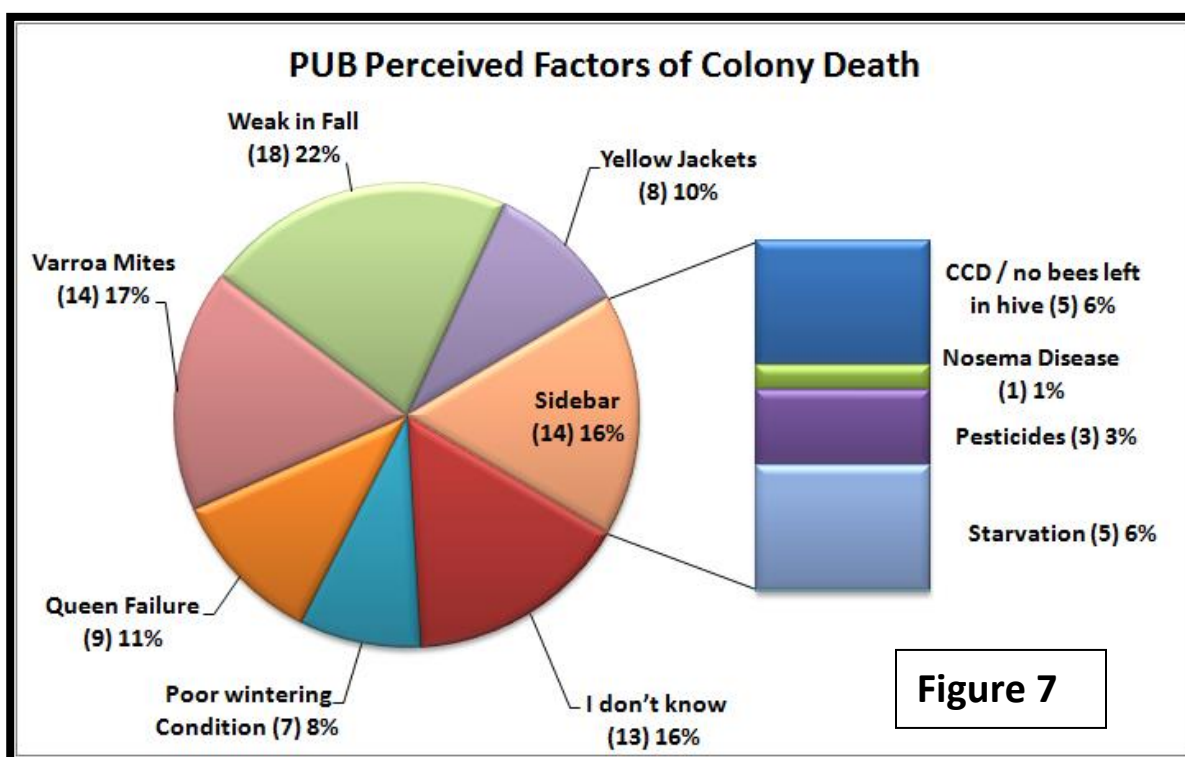
When asked to indicate where the majority of their beekeeping education was received, PUB respondent numbers varied slightly from statewide response. Multiple responses were encouraged this year as asking for the single most important choice, as question was devised last year, was reported as being too difficult to select; 2015-2016 PUB respondent data is shown in Figure 6.

For PUB members, **online reading and videos (21%) slightly ahead of books, journals and magazines (19%) was listed as most valuable**. Bee mentors and Bee club meetings (including Q&A) were similar, 19% and 18% respectively. Other choices were below 10 percent **Sixty-one percent (61%) of PUB respondents said they had a mentor available as they were learning beekeeping**, slightly less than the 65% statewide response and 13 percentage points below the percent indicated last year (74%). See Figure 6 insert.



PUB survey respondents reported a **range of beekeeping experience**. Sixteen individuals (31%) had 1 or 2 years of experience. Eight individuals (16%) had 7 years or more of bee experience, with the highest 15 years. Three years' experience was the greatest numeral response and the median, essentially the same as the statewide response.

Reason for loss: We asked individuals that had colony loss to estimate what the reason might have been for their colony losses. Multiple responses were permitted. Of 276 statewide responses, 45 chose weak in the fall (16%), 40 selected Varroa mites (15%) and 38 said queen failure (14%) as was "I don't know". Of 62 responses by PUB beekeepers, these same choices were the top 4 responses. Yellow jackets and poor wintering were selected by 8% of respondents. CCD and starvation were listed next by PUB members; none of the other choices had more than a couple of selections. See Figure 7 - both numbers and percentages are shown.

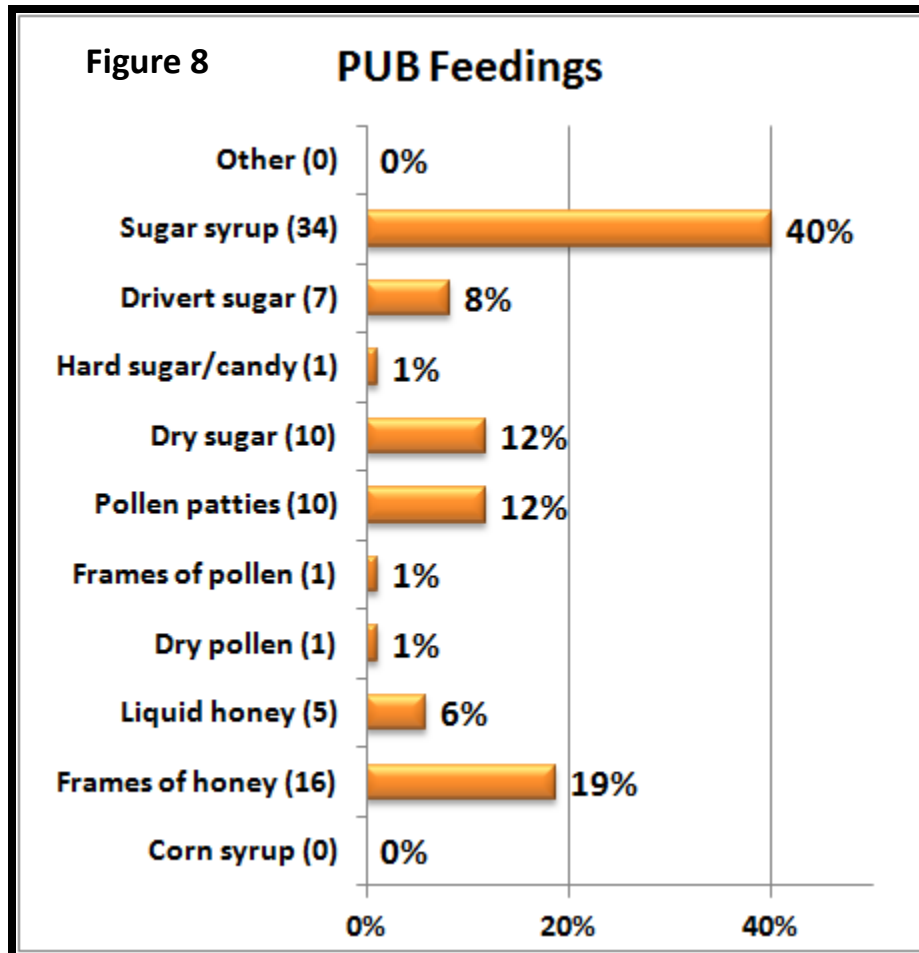


General hive practices

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

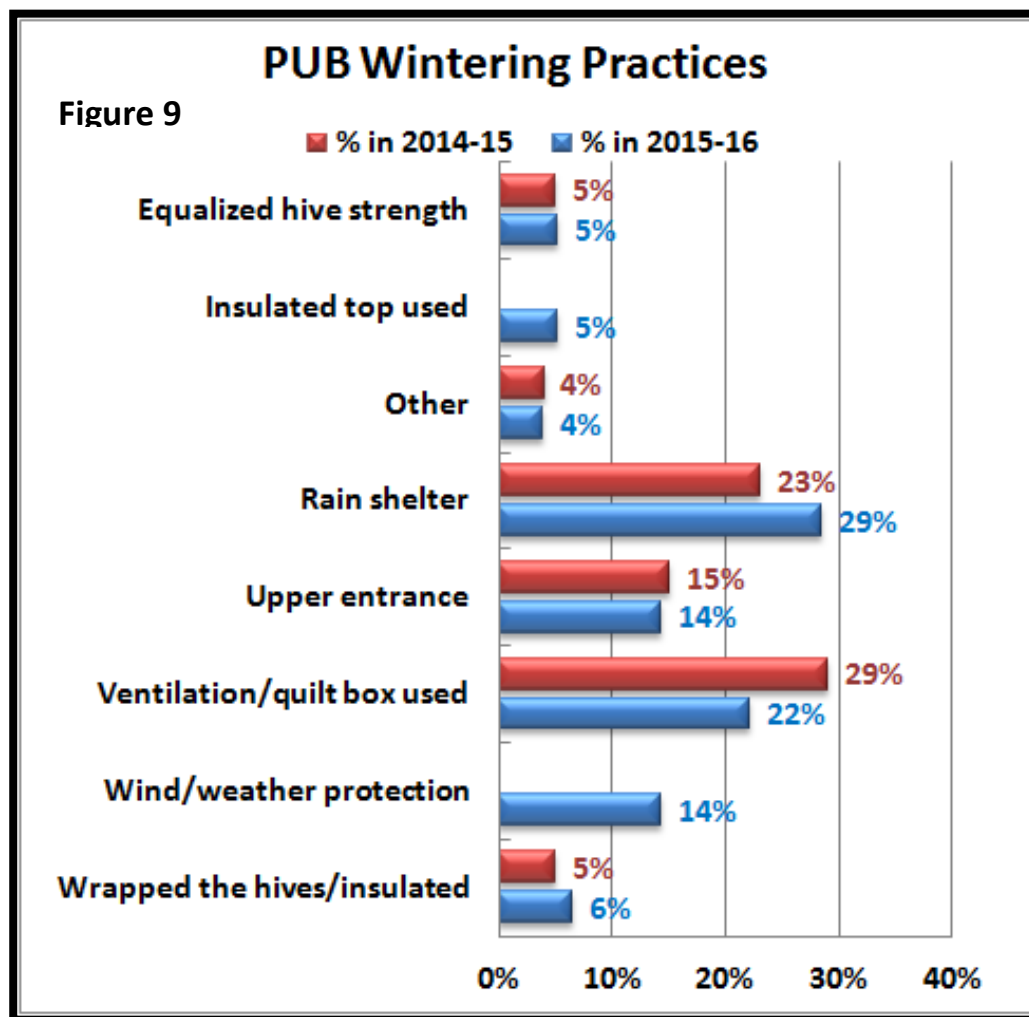
FEEDINGS: There were 549 total PNW responses to the inquiry on feeding colonies. Twenty PNW individuals (10%) did not do any of the options offered; one in five PUB members (19%) did no feeding. Of those PNW beekeepers who indicated doing feeding, feeding sugar

syrup (31%) and feeding pollen patties (19%) were the most common feeding managements, followed by feeding frames of honey (16%). For the PUB respondents, the **three highest selections (sugar syrup, frames of honey and pollen patties), along with dry sugar, were the most common feedings listed.** Figure 8 shows PUB selections. Results indicate a decent level of feeding management of both sugars and supplemental protein. No one material 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 colony moisture stress.



WINTERING PRACTICES: We received 457 responses about PNW beekeeper wintering management practices. Fifty five individuals (20%) indicated none of the several listed wintering practices was done; among PUB members, 15 individuals (16%) did NOT do any of the Wintering practices. The most common PNW wintering management selected (121 individuals) was ventilation/use of a quilt box/insulating board at colony top (27%). Use of a rain shelter was next most common (22%), with upper entrance (15%) followed closely by wind/weather protection (14%).

Among PUB members a rain shelter was the most common choice (29%) followed by ventilation/use of a quilt box at colony top. These were the top two choices last year as well with the order reversed. Provision of a wind/weather protection, a new choice this past survey year, was selected by 12% of respondents. Other choices were 6% or lower. Under other items listed was use of follower board, removal of extra equipment and a virus check were indicated. It appears that PUB backyard beekeepers are taking extra precautions to help colonies survive winter conditions. We need to compare loss rate with these practices in our further analysis of your survey responses to determine if there is a trend or if one or a few of these reduce winter loss rate. See Figure 9 for comparison of survey responses for the last two years.

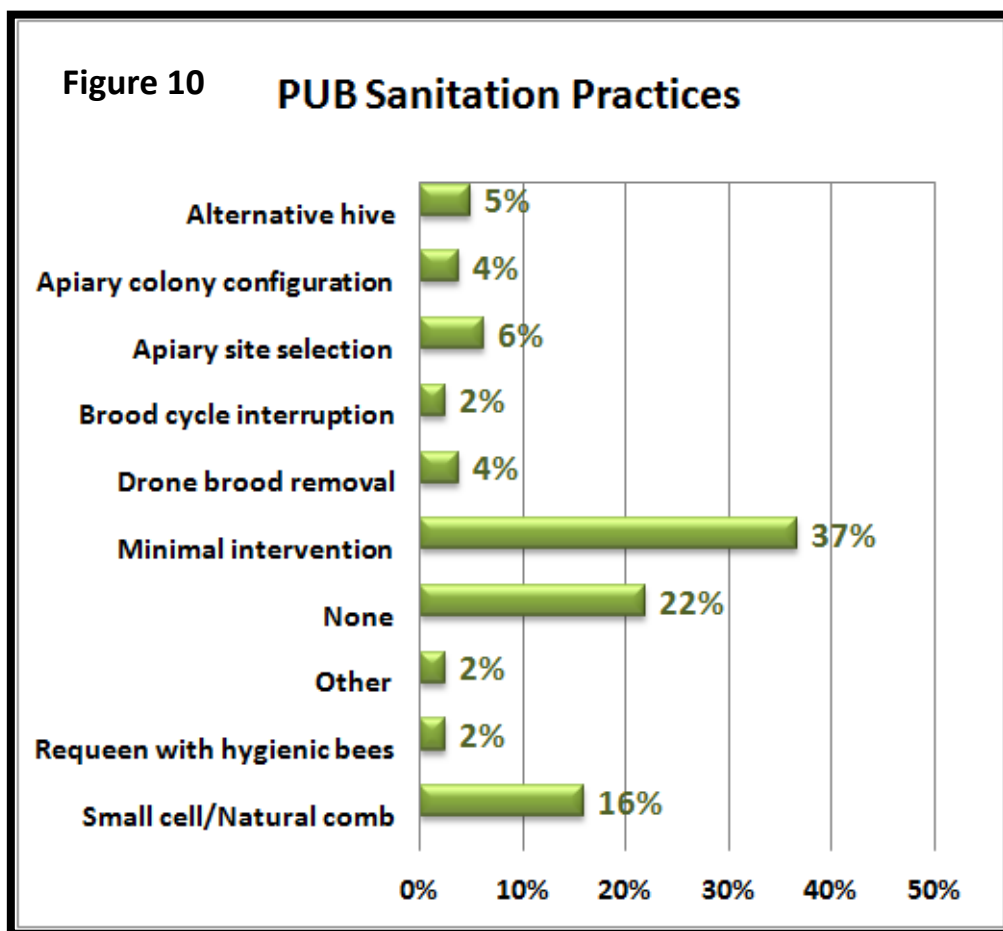


SANITATION PRACTICES: It is critical that we practice some basic sanitation (some prefer use of term bee biosecurity) in our bee care. We can do more basic sanitary practices to help insure healthy bees. We received 396 PNW responses for this survey question. Twenty-

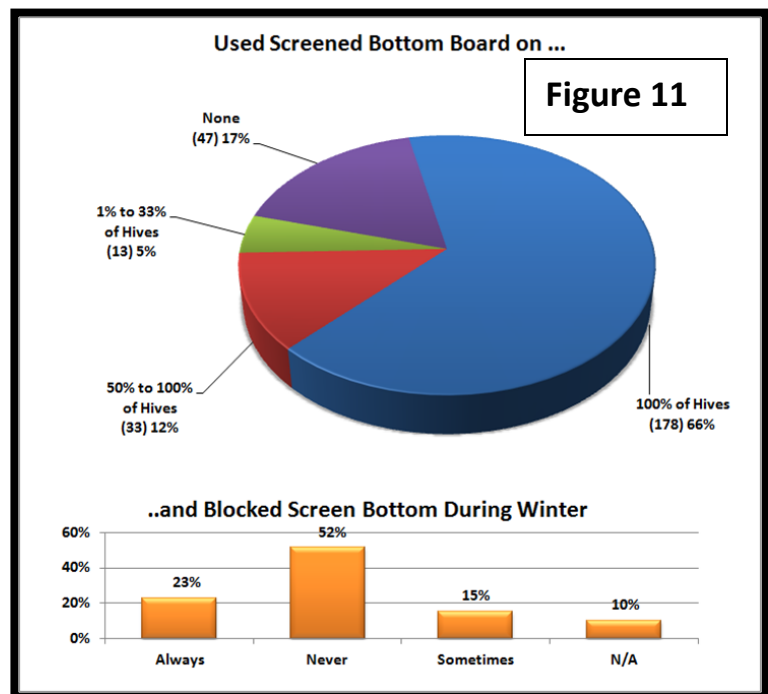
four percent (65 individuals) said they did not practice any of the 8 offered alternatives; 22% of PUB respondents said they did not practice any of the 8 offered alternatives.

Minimal hive intervention (59%) was the most common PNW respondent option selected with remaining options selections all below 10%. Minimal hive was also the top choice of PUB members. **This top choice is encouraging as less intervention means reduced opportunity to compromise bee sanitation efforts of a hive;** needless inspections/manipulation can potentially interfere with what the bees themselves are doing to stay healthy. Inspections of beginners are useful to learn about bees but each inspections should have a purpose. Apiary site selection and colony configuration within the apiary, although not commonly used by PUB or PNW beekeepers, are important sanitation choices because giving colonies 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 (16%), along with the options of requeening with hygienic bees, drone brood removal and brood cycle interruption are all active management options designed to help reduce mite levels, and while important, might not necessarily be considered sanitation (see responses to question on non-chemical control mite control for a better representation of use of these management techniques) further along in this report.

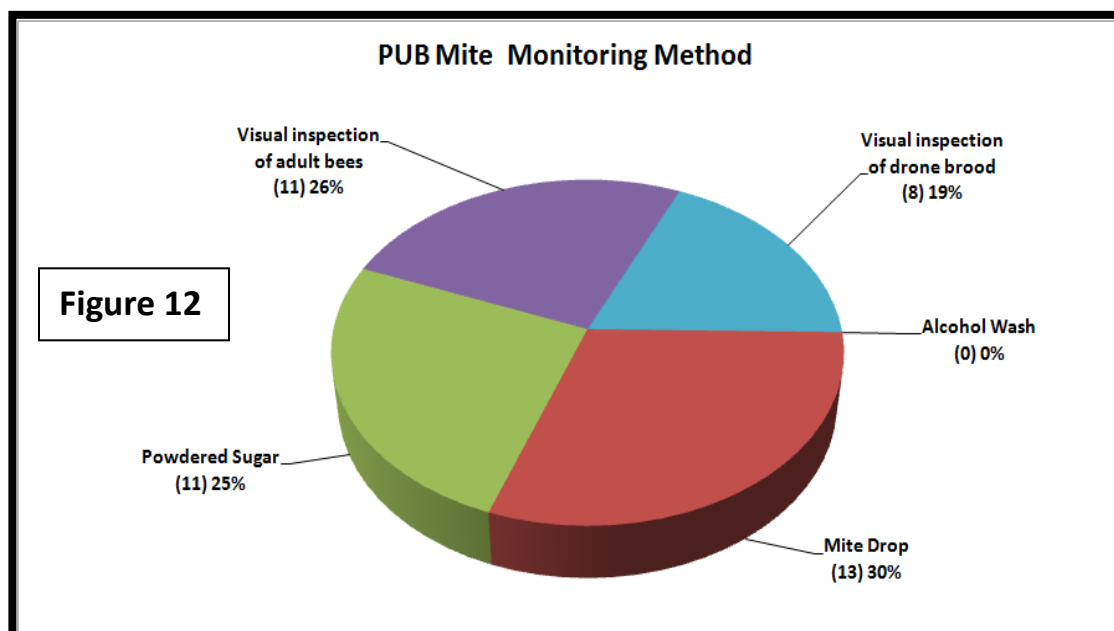


Screen bottom boards: In our national BIP surveys, fully 95% of respondents indicate they have modified colony bottom boards and now use a screen bottom board. We asked what percentage of hives had screen bottom boards and whether they were blocked during the winter. **Seventeen percent of PUB respondents said they did not use screened bottoms, 66% used them on all their hives.** The majority (52%) left them open over the winter period (never response), 15% sometimes blocked them and 23% said they closed them (always response) during the winter. Closing the screen does not seem to make a difference but some beekeepers “feel” bees do better with it closed overwinter. An open bottom, at least part of the year, is useful.



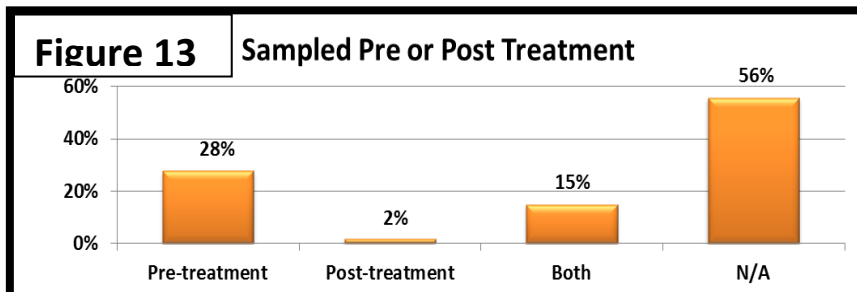
Mite monitoring/sampling and control management

We asked percentage of PUB hives monitored for mites during the 2015 year and/or 2015/2016 overwinter, whether sampling was pre- or post-treatment or for both pre and post-treatment and, of the 5 possible mite sampling methods, what method was used and when it was employed. Sticky boards (mite drop) were used by 30% of PUB members followed by powdered sugar (29%). Preferred monitoring methods are sugar shake or alcohol wash; sticky

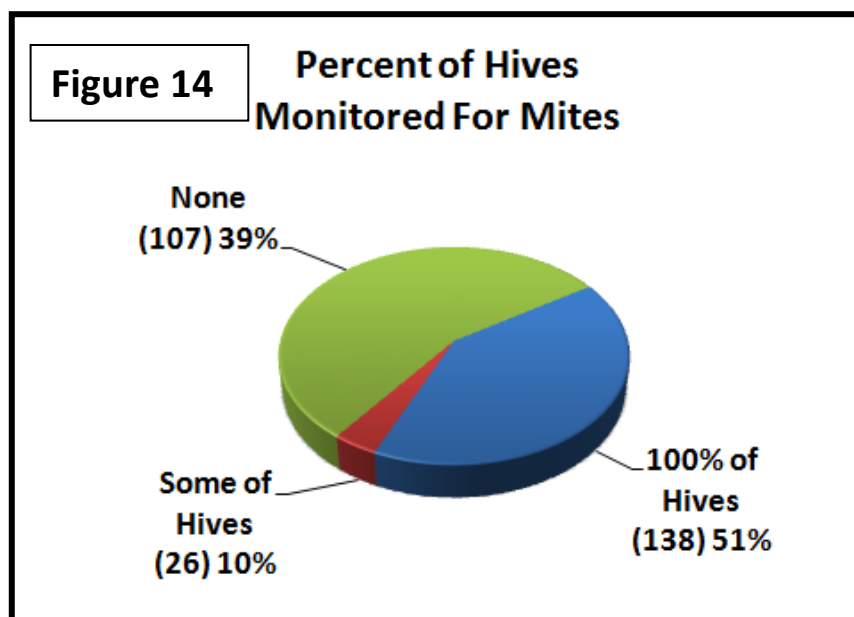


boards can help indicate a potential problem but are not sensitive enough to help with control decisions. **Visual inspections of adults or drone brood are NOT particularly effective methods.**

Pre-treatment monitoring (26%) and both pre- and post-treatment monitoring was done by 29% of respondents. Pre-treatment can help us with control decisions while **it is important to check for control effectiveness, once completed, by post-treatment monitoring.**

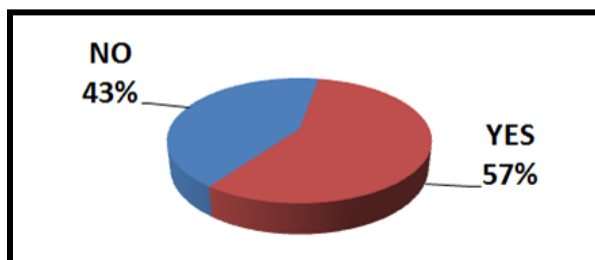


PUB members monitored less than 50% of hives compared to PNW beekeepers who indicated not monitoring 39% of hives. **It is important to monitor for mites** beginning in July and continue through the critical summer/fall months of August-October to be able to make an informed decision on the advisability of considering mite control treatment.

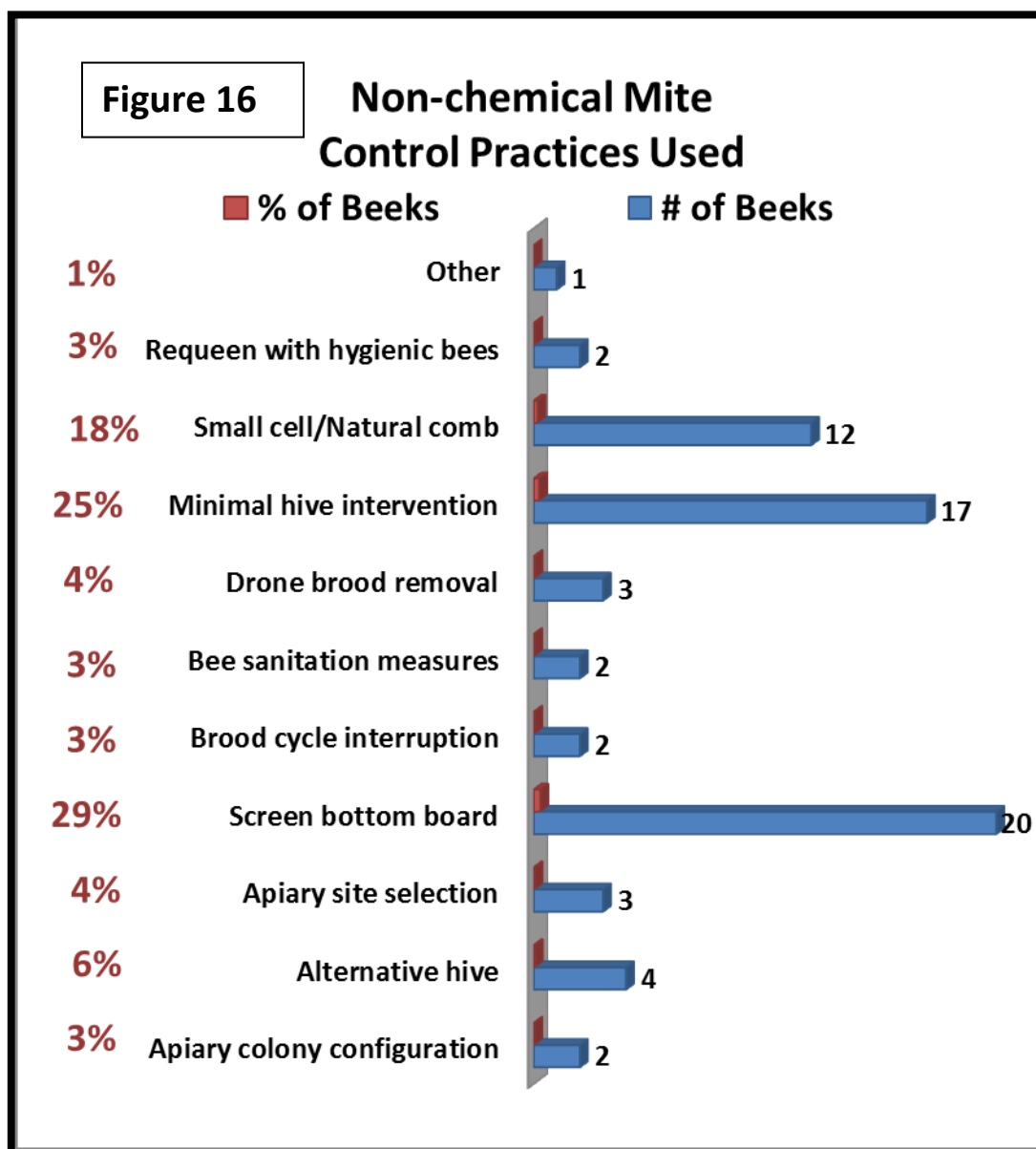


Use of medications and control treatments

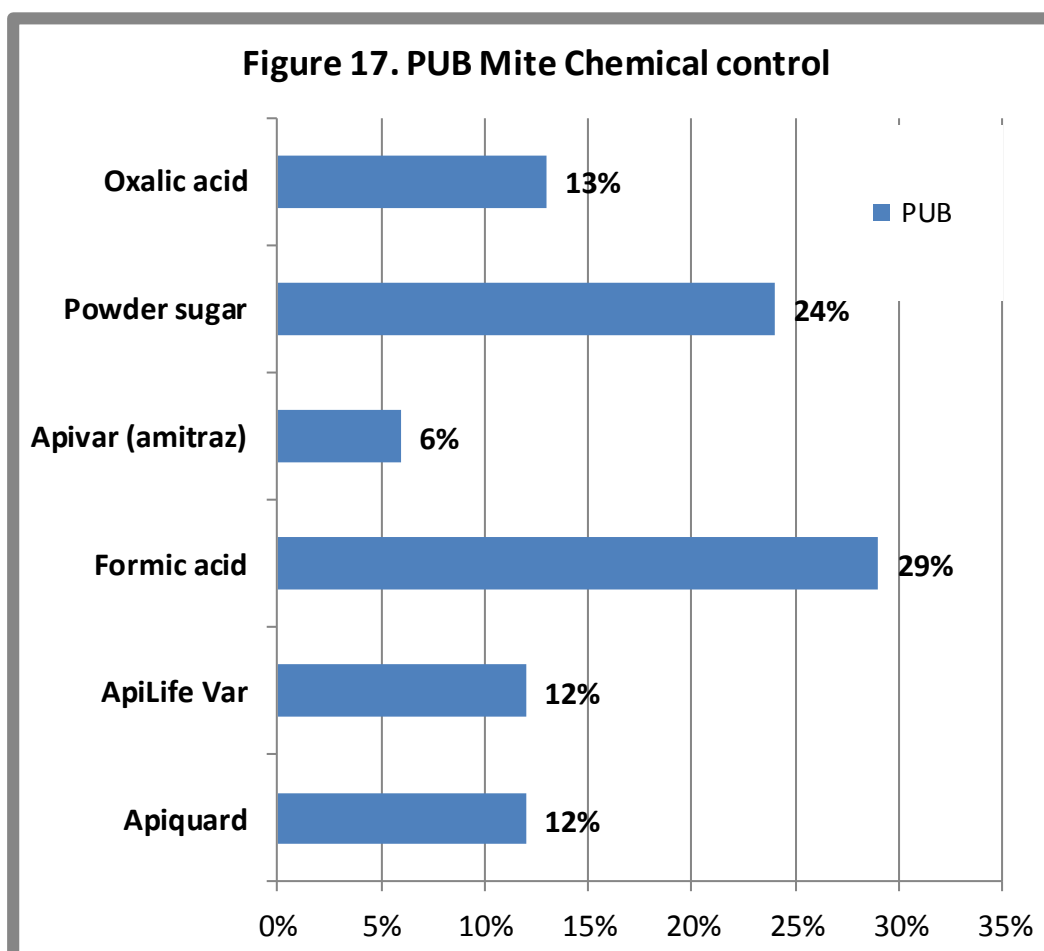
We asked about general non-chemical mite treatments and also about use of chemicals for mite control. **Eighteen individuals, 43%** - same as PNW respondents, said they **did not employ any mite control.**



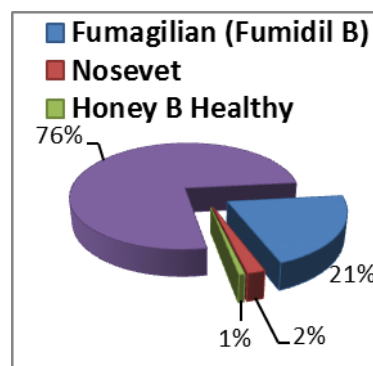
Non-Chemical control: Respondents were asked about alternative, non-chemical mite treatments employed. **44% of PUB member respondents said none of the 9 alternative controls were used.** For the respondents who checked at least one choice (more than one selection was permitted), use of screened bottom board was listed by 38% of OR respondents. This was also most frequently indicated technique of PUB member as well with 20 individuals (29%) checking this selection (Figure 16). PUB members indicated higher use of small cell/natural comb compared to other Oregon individuals and half as frequent use of an alternative hive. Drone brood removal, use of brood interruption and introduction of a hygienic queen, used by only 2 or 3 PUB individuals, are all labor intensive and require some experience to complete. They work well only under limited circumstances. NOTE: that under sanitation management these sometimes difficult management activities were also response options. **Timing of alternatives is critical to successful mite reduction.**



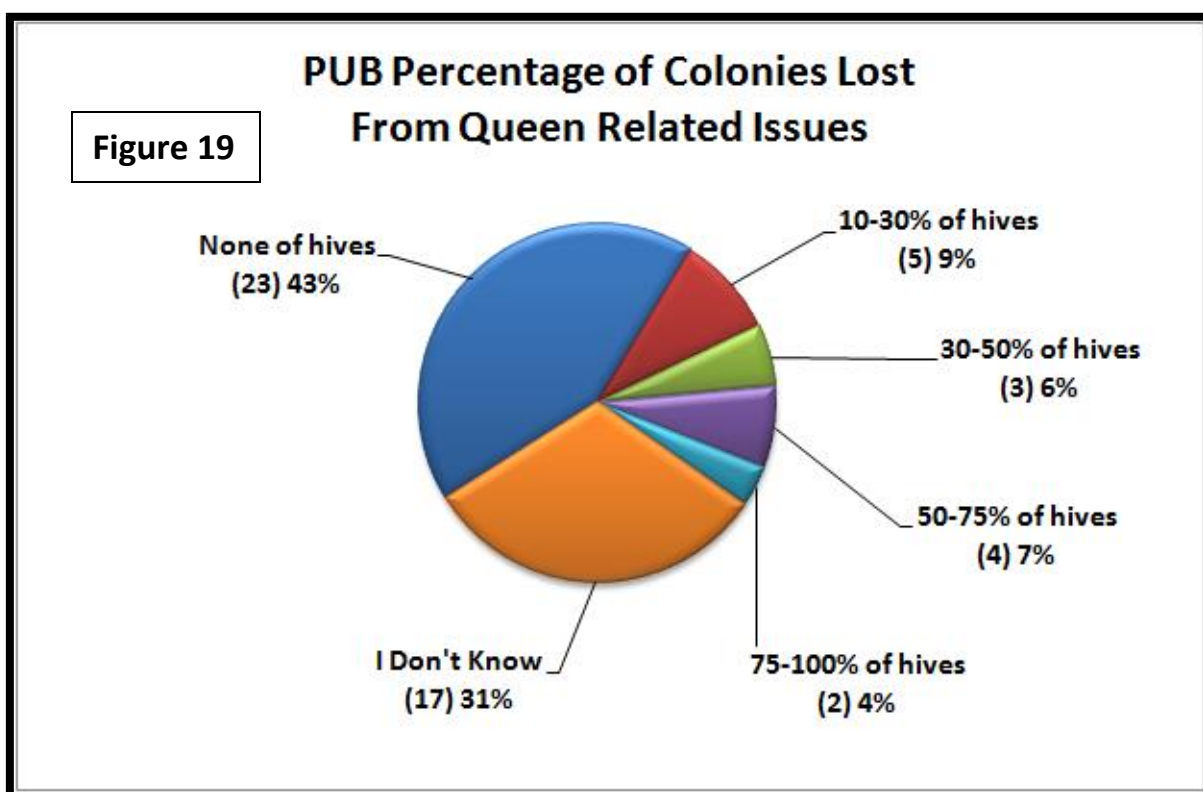
Chemical control: For chemical control, there were 210 statewide responses but only 15 from PUB members (multiple choices were permitted). Statewide, Formic acid (MAQS) and the essential oil thymol (Apiguard) were the two top elections. **Formic acid (MAQS) followed by powdered sugar were the more utilized options among PUB members.** Powdered sugar was used twice as commonly by PUB members compared to statewide respondents. Powdered sugar use, a technique that is not very effective, was used by 4 individuals while Apivar, the synthetic miticide that is the most effective treatment, was used by only a single individual. Oxalic acid, the newest control, effective when used correctly, was used by 3 individuals.



Six individuals of 144 that responded statewide indicated they treated with Terramycin for foulbrood disease, one in PUB. One used Hopguard II. Thirty individuals (21%) indicated use of Fumigillin for Nosema disease control, 2 in PUB. Three in state used Nosevet and one used Honey Bee Healthy.

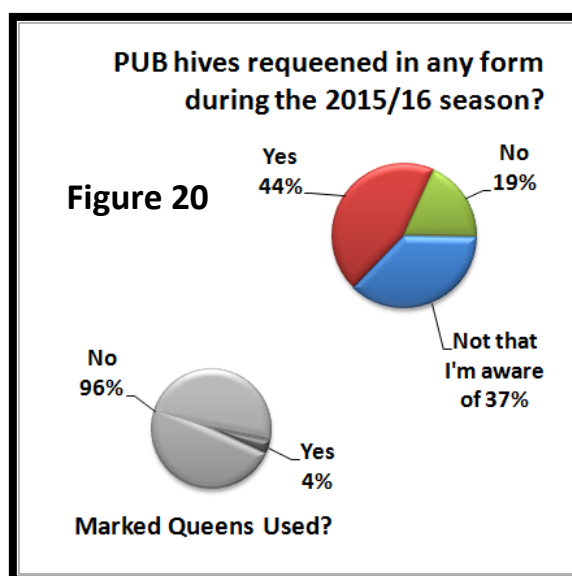


QUEENS: We hear lots of issues related to queen “problems”. On the survey we asked what percentage of loss could be attributed to queen problems. One hundred ninety three PNW individuals (70%+) said none or I don’t know. Twenty four individuals felt queen failure accounted for 10-30% of their colony loses and 23 said 30-50% of their loss. For PUB respondents, 23 individuals said none and 17 said I don’t know. Five percent thought 10-30% and 2 that 75-100% of colonies lost were due to queen related issues.

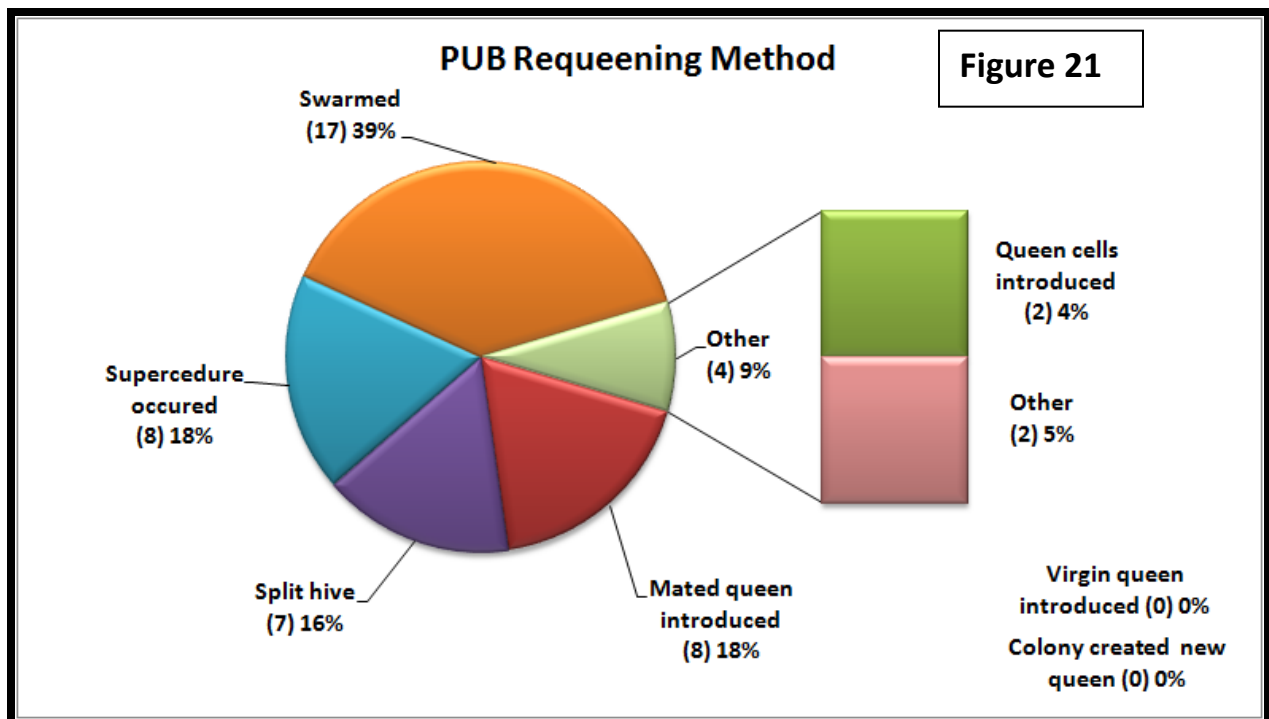


Our subsequent question asked “Did you, or did your hive requeen, in any form during the year.” Of 243 PNW responses, 87 (36%) said no, 46 said ‘Not that they were aware of’ (19%) and 110 (45%) responded yes. PUB responses (19% NO, 44% YES) are similar to statewide responses but with a lower No response as shown in Figure 20.

We asked if queens were marked. There were only 4% who said yes. It would be difficult to understand the 44% yes response to requeening, with absence of queen marking, unless the requeening was physically done by the beekeeper.



The question “How did bees/you requeen “ had 44 PUB responses as illustrated in Figure 21. Twenty five respondents indicated requeening by the bees via swarming and supersedure. Mated queen introduction was indicated by 8 individuals and 2 said via queen cell introduction. Statewide, fifty one individuals indicated they reared 150 local queens via splitting/grafting or other method. Three-fifths survived (59%) winter while 41% did not. PUB members reared 36 of these queens with winter survival of 58%.



Concluding remarks

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 BeelInformed 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. If you would lie a reminder when the survey is open please email us at info@pnwhoneybeesurvey.com with “REMINDER” in the subject line. There is a blog on the website and look forward to responding to any questions or concerns you might have.

Thank You to all PUB members 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 and Jenai Fitzpatrick, June 2016