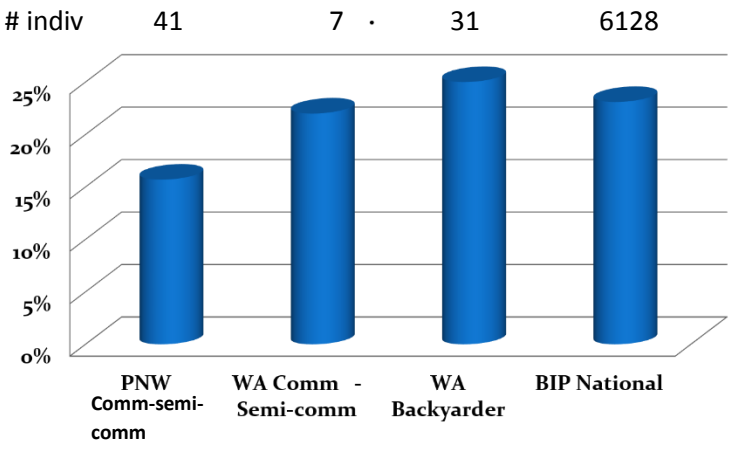
Lewis Co Bee Losses 2015 modified comments of Dewey Caron from Lewis Co newsletter post by Secretary Suzanne Weil from Wednesday, June 10 Monthly Meeting talk.

I presented results from two studies of 2014-15 honey bee losses: one specifically surveying Pacific Northwest beekeepers (pnwhoneybeesurvey.com), the other BeeInformed's national survey (www.beeinformed.org). The PNW survey, included members of 13 bee associations, including LCBA and Clark County. Many respondents were relatively new to beekeeping (45% had 1 to 3 years of experience and, on average, respondents had 4.2 colonies). On average, 69% of PNW respondents reported having a mentor, but 100% of Lewis County respondents had one. Club meetings, the Master Beekeepers' course, and online readings were the other major ways Lewis County respondents reported getting their bee information. The data supports the concept that Lewis County was doing a good job of supporting new beekeepers.

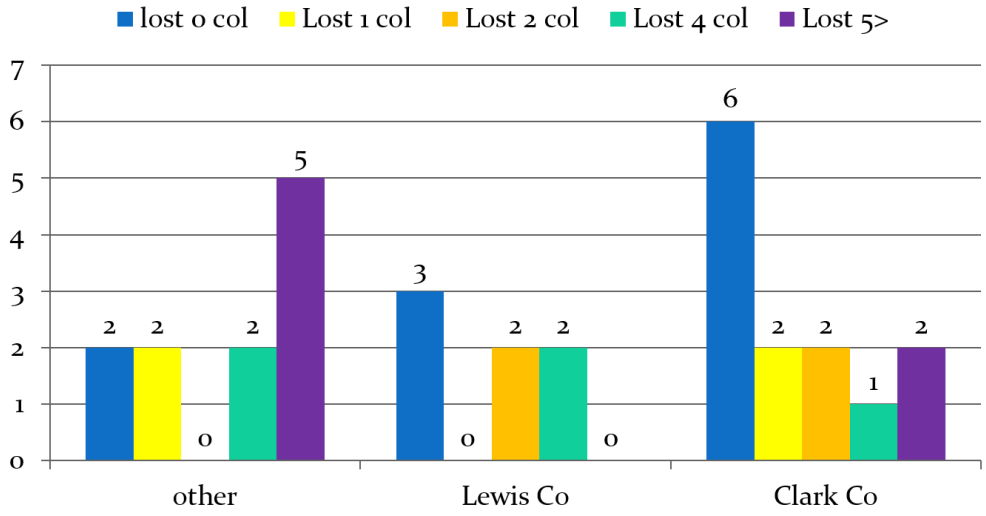
There were 7 respondents from Lewis County, 13 from Clark Co and an additional 11 from backyarders across Washington. Seven Washington commercial and semi-commercial beekeepers also participated in a mailed loss survey. This report therefore is "a snapshot," indicative rather than definitive, a look at trends. For the Pacific Northwest survey (250 respondents), the overall winter loss rate was 29% - for Lewis County, it was 18% - or, depending on how you look at it, an 82% survival rate. Clark County loss rate was 42%. For the 31 Washington backyarders loss rate was 25%. Lewis County respondent individuals were evidently doing some things more successfully.



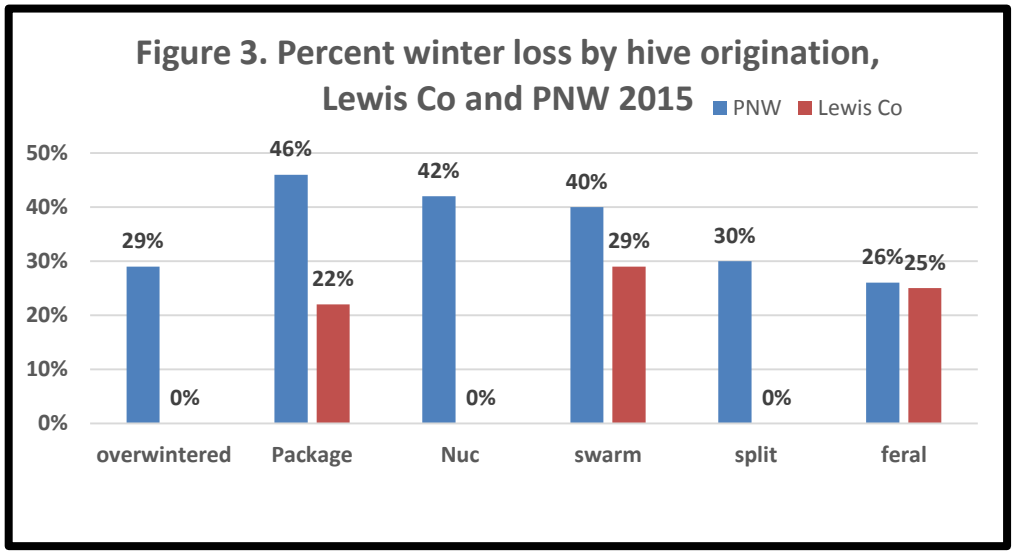
The loss rate for the 7 larger scale Washington beekeepers was 22% - they represented 59% of the estimated total colony numbers in the state. For PNW Comm – semi-commercial beekeepers (41 total individuals), the rate was 15.7%, representing about 61% of the colony total for the 3-state region. The BIP total year loss rate (over winter + seasonal) was 39% for Washington, 23% nationally.

Of the 31 individuals, 11, (1/3rd) had no loss. Eight individuals lost 1 or 2 colonies. The greatest number lost was 14 colonies (in Clark County) and four colonies by a Lewis County respondent.

Figure 2



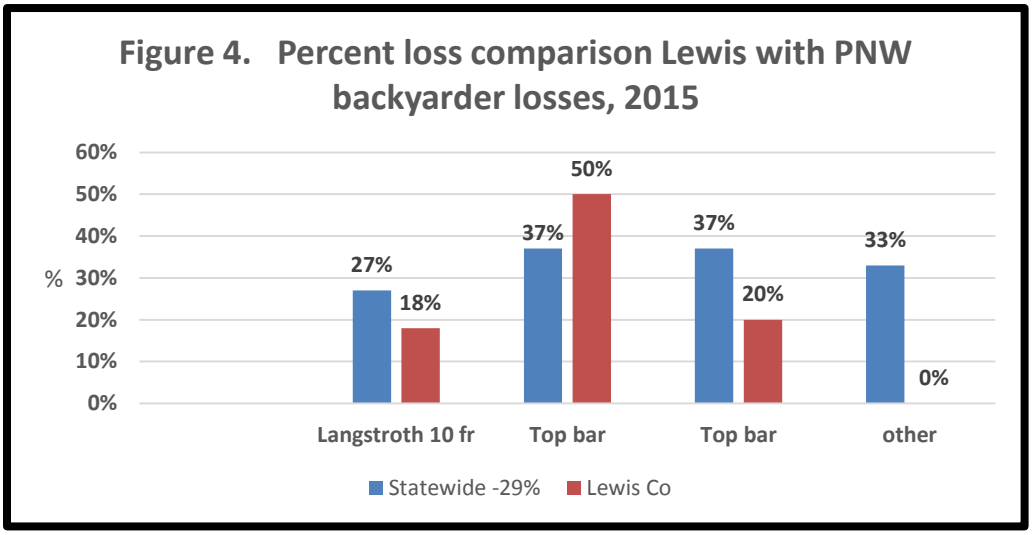
Colony losses by origin: The Pacific NW data sample covered 1274 colonies, 69 from Lewis County, and broke them down by colony origin: overwintered colonies, packages; nucs; swarms; splits/divides and feral hive transfers or cutouts. One really striking result is that overall, in the PNW, almost half of packages (46%) are lost over winter; nucs (42%) and swarm survival (40%) is better but splits and feral transfers did as well as overwintered colonies.



For PNW respondents overall, 29% of bees overwintered from 2013 were lost, compared with 0 of 6 overwintered colonies in the Lewis County sample. For PNW respondents overall, 46% of packages bought in 2014 were lost: LC, 22%. For PNW respondents overall, 42% of imported nucs were lost, compared with 0 of 5 in LC data. For PNW respondents overall, 40% of swarms hived in 2014 were lost;

29% in LC. For PNW overall, 30% of splits/divides were lost, compared with 0 of 4 in LC. For PNW overall, 26% of feral hive transfers / cutouts were lost, compared with 1 of 4 25% in LC.

Colony losses by type of hive: Loss data were computer by hive types: Overall, data showed that the choice of 8 v. 10 frame hive boxes makes no difference in overwintering success, so those who prefer the management advantages of 8 frames are not harming their bees by that choice.

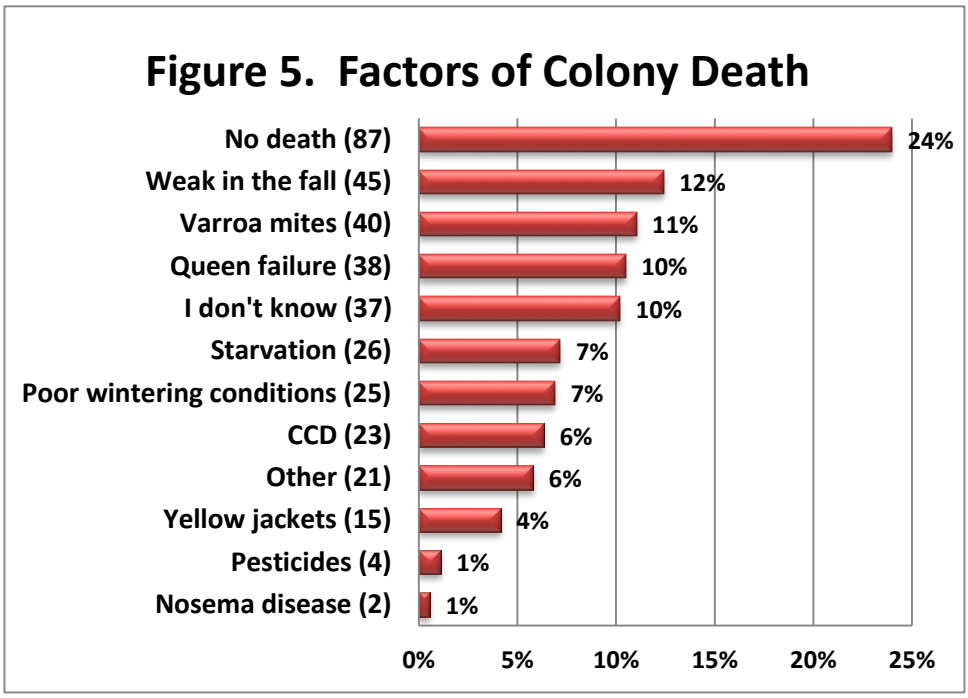


PNW respondents reported that they lost 27% of colonies in 10-frame Langstroth; Lewis Co respondents lost 10 colonies, 18% (no 8-frame Langstroth hives were reported among Lewis co respondents). PNW respondents reported that they lost 53% of colonies kept in 5 frame nucs; none recorded by Lewis Co respondents. PNW respondents reported that they lost 49% of colonies kept in top bar hives; LC, 50% (however, this 50% reflects 1 of 2 reported colonies in top bars). One "other" colony, a feral colony survived the winter.

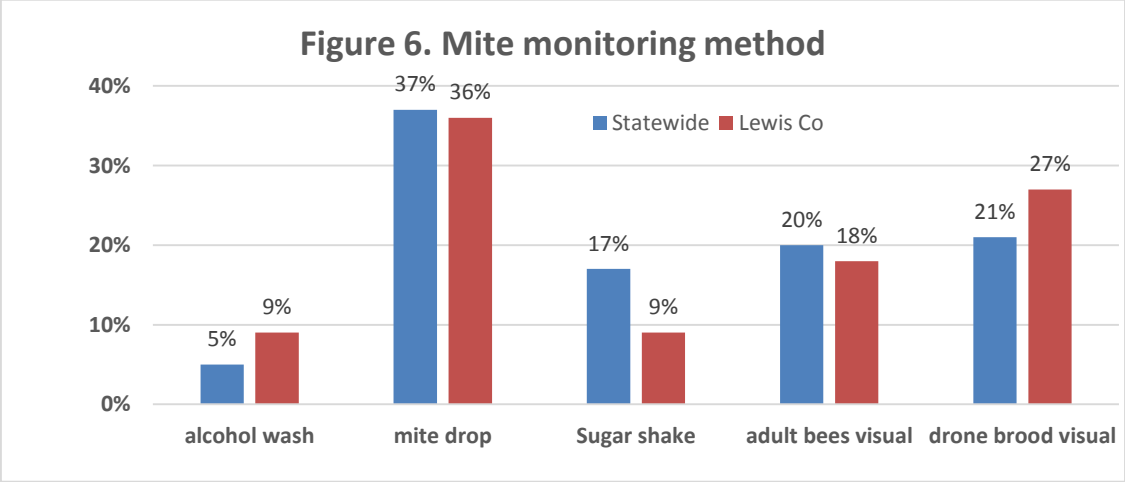
Nationwide data from BeeInformed.org: In 2014-15, total annual losses were 42%; total winter losses were 23%. Total season losses (5 year average) are 37%; winter losses were below the 9 year average loss level of 29%. BeeInformed started gathering data contrasting year-round with winter losses in 2010-11, and while the data show that on average, most of our bee losses take place in winter but losses outside that season are not trivial, either. Backyard or hobbyist beekeepers have heavier losses in winter; commercial beekeepers have higher losses in "bee season." PNW state seasonal losses ranged from 25% (Oregon) to 39% in Washington. The number of BIP survey respondents in both states has been over 200 individuals.

One interesting report on the BIP survey is that individual beekeepers report that an acceptable loss level has gone up from about 12% in 2010-11 to about 19% now. The BeeInformed survey estimates that the 2015 report included responses from 14.5% of the nation's beekeepers.

Self-reported "reasons" for colony losses: See the chart below for the PNW data base. Lewis County respondents with loss (3 had no loss of 7 respondents) included Varroa mites as the top factor in their bee losses. Other LC respondents indicated "I don't know", weak in the fall and mice.



Mite monitoring management: It is important to KNOW YOUR MITE NUMBERS and use monitoring to confirm what you are doing/did for mite control helped. You might actively choose to treat or not to treat a colony, but if you don't sample your bees for mites before and after, you don't know how your approach worked.



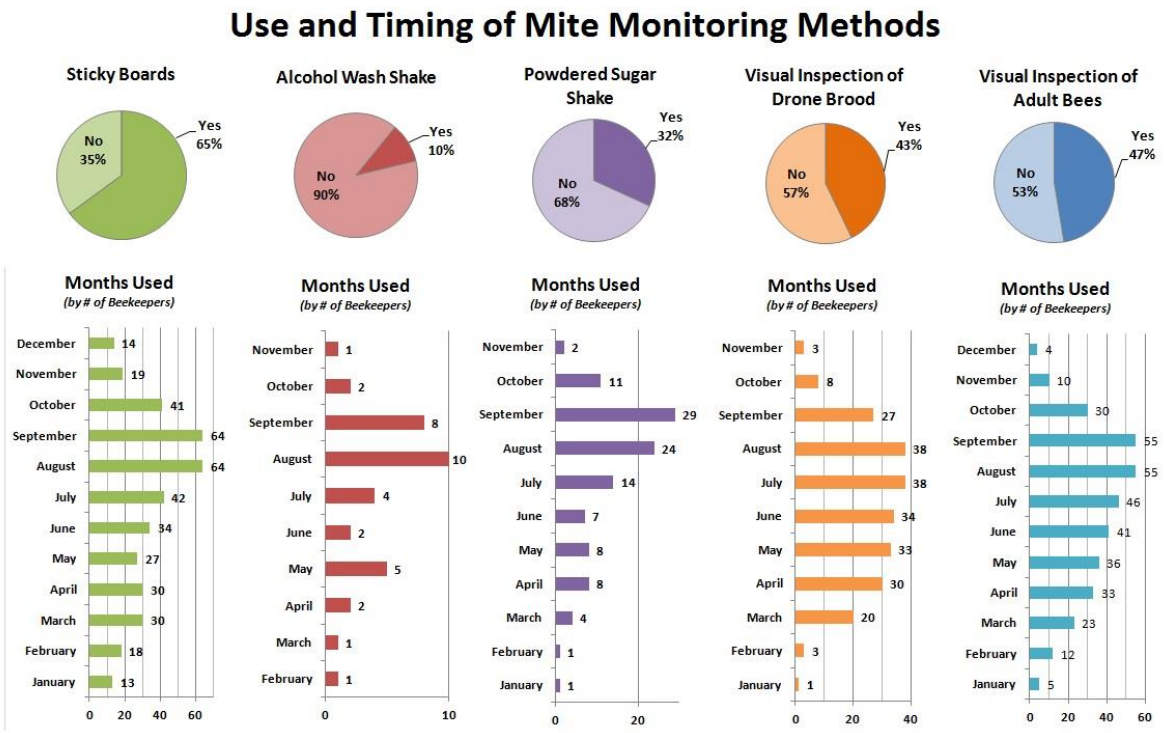
The main mite monitoring approaches reported by respondents were sticky boards (37%) but visual inspection of adults and drone were very similar. Sugar shake was favored by 17% with only 5% doing alcohol wash. Lewis County responses mirrored those of PNW beekeepers. See figure 6.

Two methods of sampling have proven to be more effective: the sugar shake and the alcohol or use of low-sudsing soap wash (URLs for videos on both methods are in Lewis Co April-May 2015 newsletter). 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 15 mites to 100 adults

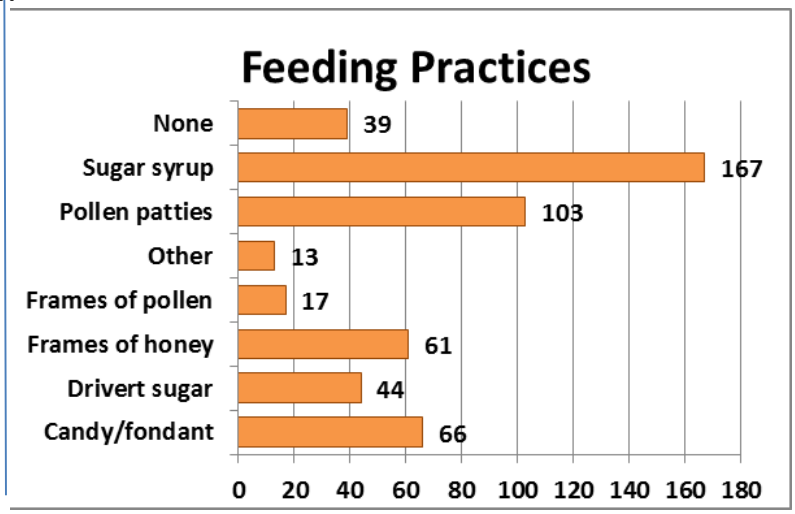
Less effective mite monitoring methods include sticky (detritus) boards below the colony (but often so much detritus drops onto a sticky board that picking out the mites can be hard, especially for new beekeepers). Visual sampling is not accurate: most mites are not on the adult bees, but in the brood.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

Most who used sticky boards tested in August or September.



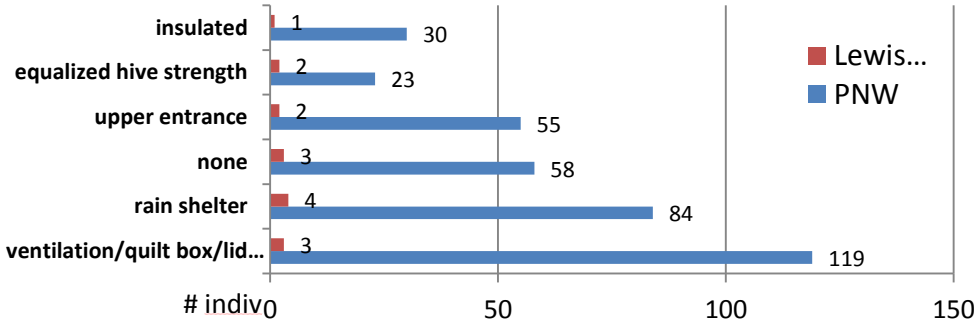
Management questions: did people use candy, drivert sugar, frames of pollen, pollen patties, sugar syrup, or none of the above? What about wintering practices: did beekeepers insulate hives, equalize hive strength, add upper entrance access, provide a rain shelter, give ventilation, or use a quilt box? Are we doing the sanitary practices we would in animal husbandry with our bees? Do we clean hive tool between inspecting different hives? When we take a frame from one to another do we know that hive is healthy? The data base will allow a comparison of loss rates with these assorted methods as we are doing with BIP data. How do management practices affect colony losses? Remember these will be correlations, not necessarily causation since we know bee losses are due to multiple factors (see for example Figure 5 above for the self-reported respondent "reasons" for their losses). It is not valid to assume that if you do x, you won't have losses; the data mean that some people doing x don't report heavy losses. The data can help us think about what we are doing and perhaps should be doing.

FEEDING PRACTICES: The number of PNW responses (510 total) are shown in bar graph Figure 8. Thirty-nine individuals (8% of total) did not do any of the options offered. Sugar syrup (33%) and feeding pollen patty (20%) were the most common management. Feeding fondant/candy (13%) and providing frames of honey (12%) were next most common with drivert and frames of pollen less commonly fed. Under "other," dry sugar or dry pollen or honey as a liquid were indicated. Lewis County respondents, except for the one individual that indicted none did multiple feeding practices. All indicated use of sugar syrup (one used corn syrup), and candy/fondant feeding, 4 of 6 used pollen patties and 2 used frames of honey with one individual listing also frame of pollen. Very proactive feedings indicated.



WINTERING PRACTICES: We received 385 responses about wintering management practices from PNW beekeepers and 4 of 7 Lewis County members (more than one option could be chosen). Fifteen percent (15%) of PNW responses 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 (31% PNW). Use of a screen bottom board was indicated by all 4 LC beekeepers and 3 of the 4 indicated use of a rain shelter (22% PNW) and upper ventilation or quilt box. Each of the other choices was also selected; 2 indicted upper entrance use. See Figure 9 below.

Figure 9. Wintering practices Lewis Co and PNWbackyarders,



Some choices were not mutually exclusive and this question needs to be revised for a subsequent survey season. Additional items listed by PNW beekeepers included using cedar lumber for box or lid construction, or use of special lid with moisture trap, tilting hives forward, tying colonies down, use of a wintering shed, adding mouse guard and providing a winter wind break.

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 440 responses for this survey question. Ten percent said they did not practice any of the 8 offered alternatives. Screen bottom board use (38%) was the most common option selected – this was encouraging because bees need to get rid of diseased brood, pests and other potential negatives from within their hive. The screen bottom helps promote a "garbage pit" for getting potentially harmful organisms and materials out of the hive. The next most common selection was minimal hive intervention (15% 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 site selection (8%) was slightly

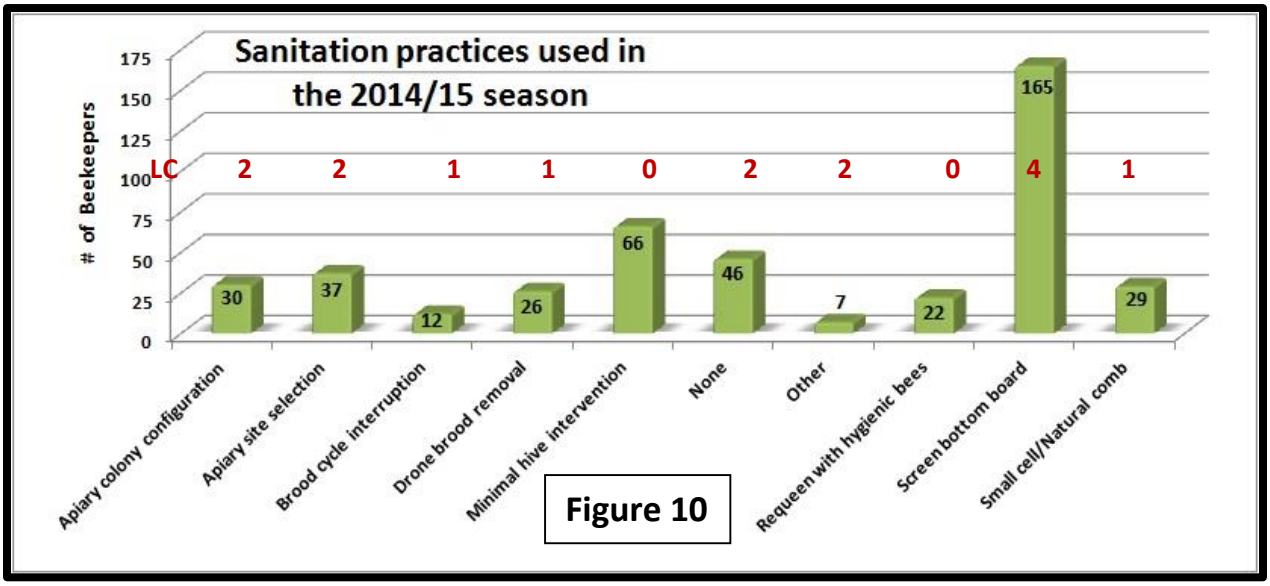
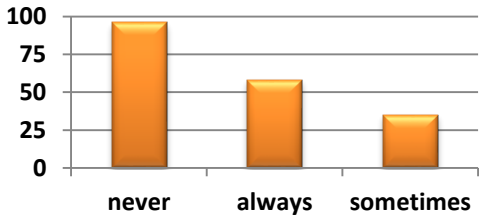


Figure 10

more common as a choice compared with small cell/natural brood, apiary colony configuration, drone brood removal and requeening with hygienic bees (7% to 5%). Lewis County sanitation selections, 15 total, are shown in red line at 100 beekeepers, were screen bottom board (4 of 5 individuals), with the remainder listed by 1 or 2 individuals; none selected minimal hive intervention or requeening. Figure 10 above.

Other sanitation measures listed were cleaning of hive tool between inspections, and not transferring frames between hives. Two other practices listed by Lewis County beekeepers were planting medicinal plants in apiary and replacing/cleaning moldy boxes/frames.

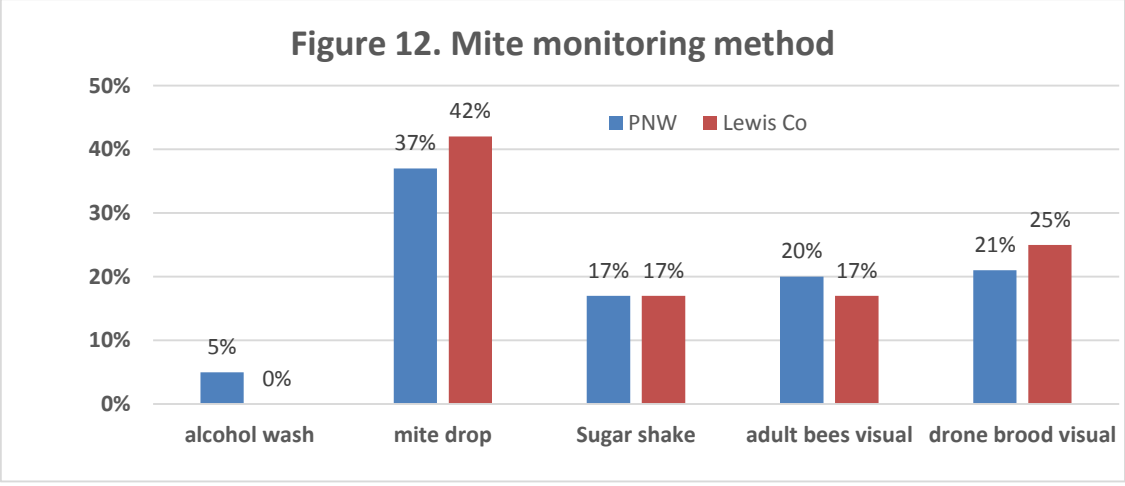
Screen bottom boards: In our national BIP surveys, fully 95% of respondents indicate they have modified colony bottom boards and now use a screen bottom board. We asked what percentage of hives had screen bottom boards and whether they were blocked during the winter. For PNW beekeepers 21% said they did not use screened bottoms; for Lewis members only 2 of 7 individuals (28.5%) said they did not use them. For PNW beekeepers 66% used them on all their hives while 60% of Lewis County beekeepers using Screen bottom boards used on all their hives. The majority in PNW (51%) left them open over the winter period (never response). 18% sometimes blocked them and 31% closed them during the winter.



Things that seem to improve winter success: Moisture kills bees, not cold, so locate hives out of the wind, in the sun, and protected. Leave screened bottom boards open and insure and top ventilation. Use screen tops with moisture collector such as burlap, straw, old towels, etc. Feed bees to insure enough food stores. According to the BIP data southern beekeepers who used screened bottom boards did not have lower winter losses, but in northern states, data showed 12.4% reduction of losses reported by those who used screen bottom boards.

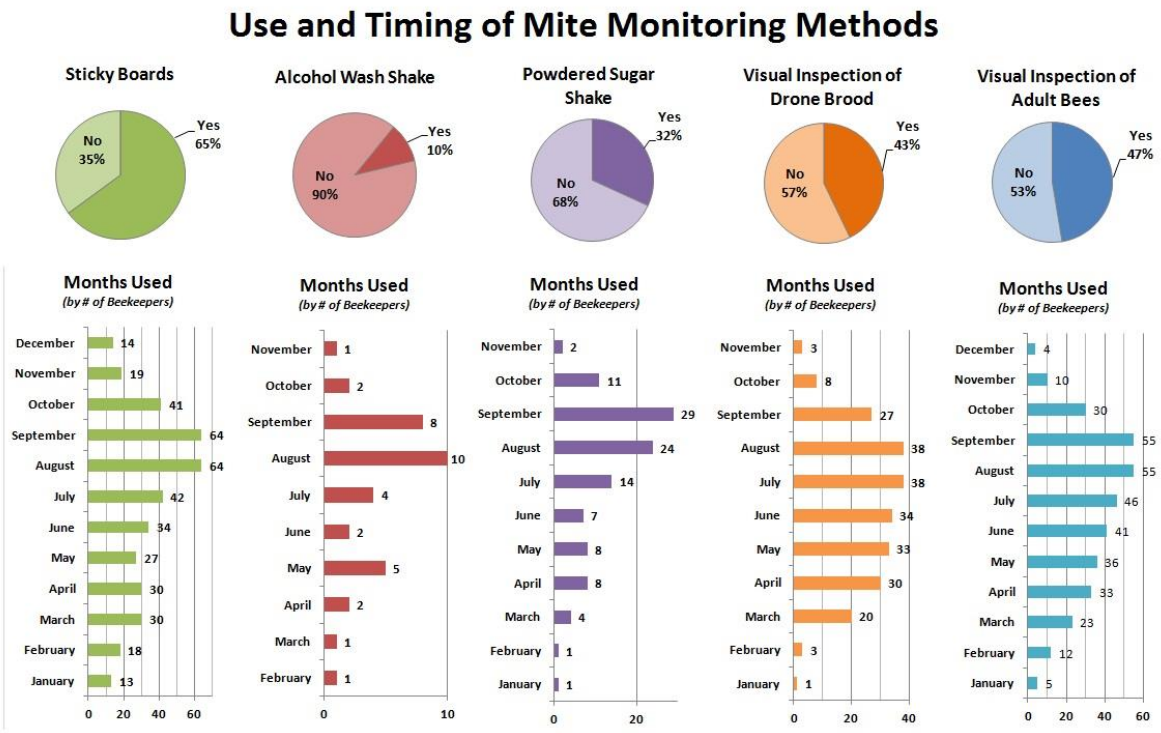
Mite monitoring/sampling

The PNW survey 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, sticky boards were used by 37% (for Lewis 80% used with choice indicated 42% of total selections – multiple choices were permitted). None in LC used alcohol wash, two used sugar shake (17% of choices). Visual inspection choices were similar to those of PNW beekeepers.



Most sampling was done in August September and October as might be expected (Figure 13).

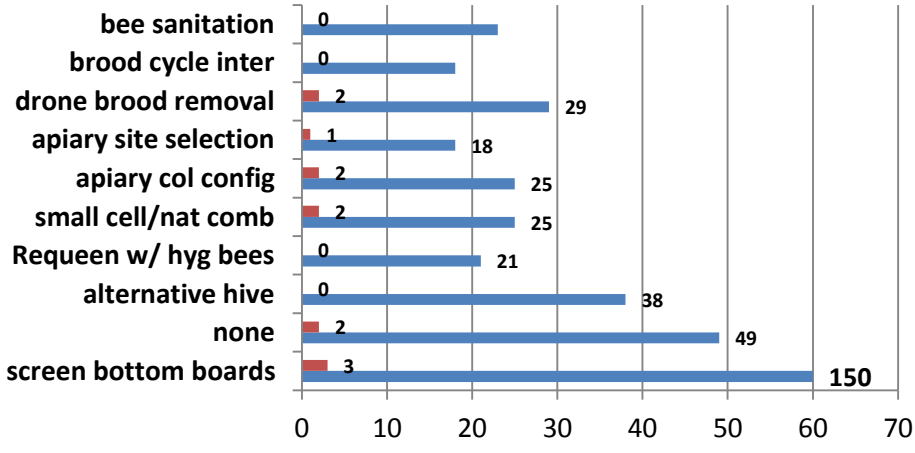
Figure 13



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, 12% (49 individuals) said none of the 9 alternatives was used; 2 individuals said same in Lewis Co. For the PNW respondents who checked at least one (more than one selection was permitted), use of screened bottom board was listed by 150 individuals (42% of respondents) who did indicate use of at least one of the techniques. The next most common selection was use of an they alternate hive (11% then drone brood removal. The rest of the 7 selections were chosen by fewer than

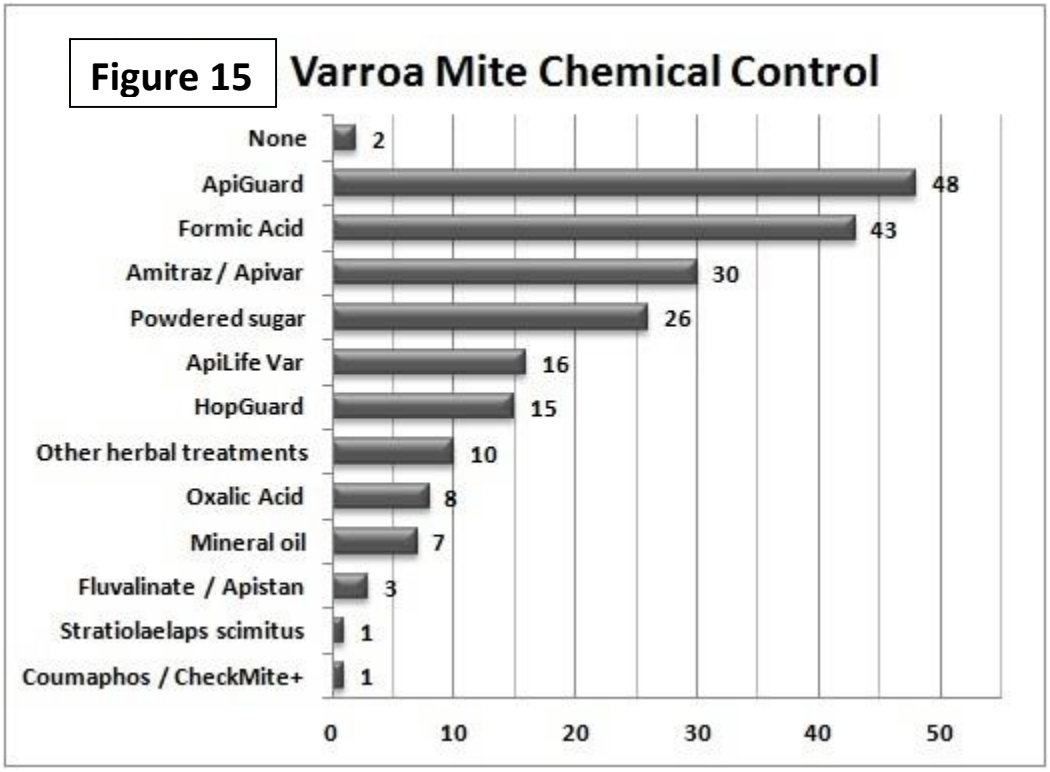
Figure 14. Mite Control Practices



25 individuals each. The responses for LC individuals are shown in figure 14 closely mirrored those of the PNW respondents. Most LC respondents used more than one of these practices.

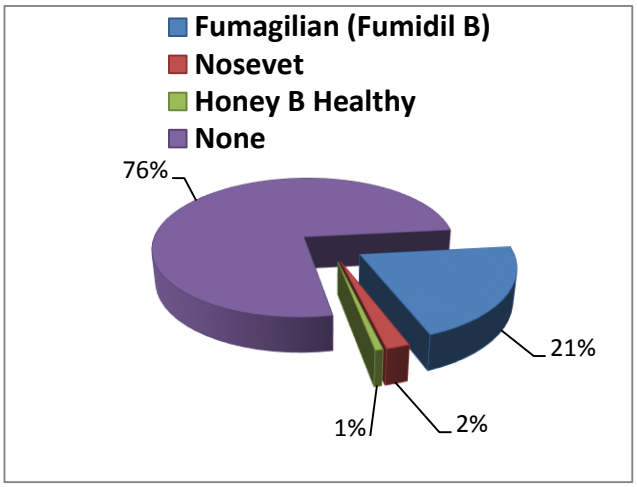
Chemical control: For chemical control there were 215 PNW responses, 1 LC beekeeper used a mixture of Hopguard and Apistan + coumaphos. For PNW beekeepers Apiguard (26%) followed by Apiguard (21%), then MAQS, formic acid strips and powdered sugar were the top 4 materials used. Many more than the 2 shown in graphic used nothing.

Figure 15



Six individuals of 144 PNW respondents (4%) indicated they treated with terramycin for foulbrood disease, one was a LC member. Thirty individuals (21%) indicated use of Fumigillin for Nosema disease control, 1 in Lewis Co. Three PNW individuals indicated use of Nosevet and another indicated use of Honey Bee Healthy. See Figure 16

Figure 16



What works: 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. A female mite in a drone cell can reproduce 3 daughters, as opposed to 1 in a worker cell. If we harvest the drones at capping stage before they emerge as adults, we knock down that mite number as it is growing. Feed the drone brood to your chickens. The colony doesn't need that many drones. For northern beekeepers drone brood removal reduced winter losses 10 to 33% reduction in loss (according to BIP data), so it may have helped. This technique only works during spring buildup.

Breaking the brood cycle, with requeening, especially if hygienic queen stock or local selected stock, 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. They are often the best choice when 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) and oxalic acid), essential oils [Apiguard or Apilife-var] 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. They work best under certain conditions.

For essential oils, those who used the essential oils Apiguard or Apilife Var reported 26 to 31% fewer overwintering losses in 4 consecutive BIP survey years. Honey-B-Healthy, a sugar syrup with drops of 2 essential oils is not of sufficient strength to control mites, and there was no significant difference in losses for those who did v. did not use it. Concentration (dosage) is the difference between a food, a medicine, and a poison. In HBH, there is not enough essential oil to control mites; however, HBH does have other uses, such as helping bees accept sugar syrup, and helping unite swarms.

Formic acid (Mite-Away Quick Strips, or MAQS) when used reduces losses 16 to 31 %. Those beekeepers using Hopguard II reported 10% fewer losses in one survey year, 2013-14 (it is a relatively new absence period in the hive. product). There have been heavier queen losses noted with MAQS and Hopguard II has completely failed for some beekeepers. Oxalic acid is the newest mite killing agent. BIP respondents reported 37 to 41 % fewer losses when it was used during late fall or during a seasonal capped brood absence.

Apivar [amitraz] users reported 35 to 47% fewer overwintering losses, but it does have possible side effects: it may affect drone sperm and queen rearing.

Queen related colony loss: Dewey reported that while we know this is happening, we are not yet getting at what is causing these losses. 45% of respondents re-queened, or their colonies did. 36% did not, and 19% said not that they were aware if their queen were replaced or not. Queen stock are a key to eventually not having to do constant mite control. There are local queen rearers working on breeding bees for our habitat (including a group in Washington and another in Oregon. 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.

Final note: Bee counted: Bee informed! If you find any of this useful – it is beekeepers communicating to beekeepers – Please consider participating in the PNW and/or the National BIP survey next April! Please help make the Lewis County report more robust with a larger participant base next year.