How Hard Could It Be?

Some of us observe trends around us and find opportunities to interrupt or reverse those trends when we see a potential for pain in the future. When Jaylene and Loren combined the components of honey bees, parasitic Varroa mites, and people who try to be responsible beekeepers, things got a little wild. They want to share the results of their experience with you in hopes that you and the bees in your neighborhood will benefit from their experience.

During the fall of 2016, we scratched the caps on some drone brood and were unpleasantly fascinated by the tremendous number of Varroa mites hiding under those protective caps of wax. When we pulled some of the drone larvae from the cell and observed that many of the drones would have emerged with stubby, club-like appendages instead of flight-enabling wings, we immediately knew that we must find a way of dealing with Varroa mites. Staring at 6-8 mites per larvae and the symptoms of Deformed Wing Virus made us wish that we had educated ourselves more quickly and taken steps to interrupt the exponential growth of the Varroa.

We learned a few Varroa lessons during the past couple years in western Montana that we want to share with you in hopes of shortening your learning curve:

1. If you don't treat the Varroa mites that will eventually find their way into your hives, odds are high that within 1-2 years, your colony will die and you'll be replacing it in the spring.
2. Educating fellow beekeepers about Varroa is challenging because of a number of factors including: the desire to practice "natural" beekeeping, Varroa medications with restrictions for temperature, the presence of brood, the presence of honey, human safety, and perhaps the greatest threat of all, a volatile combination of a lack of knowledge and procrastination.

Lest you jump to the conclusion that we're a bunch of sluggish ignoramuses in Montana, we want to give you an example of how we've tried to develop a better solution by combining our successful and failed experiments in beekeeping and advice from trusted beekeeping experts.

After observing the severe infestation of Varroa in the above picture, Loren dug into the many internet sources to develop a plan for testing for Varroa numbers in his colonies and treating. He and a couple other beekeepers sampled drone brood and found that Varroa were present on approximately half of the larvae. Immediately after finding all the infected drone brood, we performed a powdered sugar roll on a half cup of bees from the very same hive and found not a single mite in the jar. Hmmmmm. There went our confidence in the powdered sugar test! After asking a few beekeeping experts, we decided to use a sticky board and treat if there were more than 20 mites on the sticky board during a 24 hour period. Loren performed sticky board tests throughout the summer of 2017 and observed very low drop counts. On October 1st, Loren had drop counts of 1, 5, and 15 on his 3 colonies. Although well below the treatment threshold, he decided to take 10 cents worth of oxalic acid and treat with his Vape-A-Mite oxalic acid vaporizer. After the treatment, he documented the results by counting dead mites on the sticky board every 2-3 days. Eighteen days after treatment, the cumulative dead mites in each hive totaled 54, 2,172, and 2,313 mites respectively. Yikes! Two of those colonies had severe infestations no matter how you want to calculate the mites/bee count. Any perceived confidence in the sticky board as an effective tool for determining the severity of the Varroa infestation rate in a colony went out the window.

That left us with one remaining option: the bee-killing alcohol wash test. The reasons for our reluctance to select this method earlier included the thought of intentionally killing 300 nurse bees and the possibility of accidently including the queen with the other doomed nurse bees. However, after watching Randy Oliver's videos at scientificbeekeeping.com and observing Randy as he performed the alcohol wash test during his two day seminar in Missoula, we decided that we could handle those risks. We decided to pursue a method to deal with our hesitations to adopt this method and also enable our bee club members to ***easily*** get started with the most scientifically reliable method available to test for Varroa infestation rates. This goal required us to accomplish two tasks:

1. Follow Randy Oliver's evolving instructions at http://scientificbeekeeping.com/an-improved-but-not-yet-perfect-varroa-mite-washer/ for building an inexpensive alcohol testing container.
2. Mass produce the containers and give them to our bee club members, and encourage them to test and treat for Varroa.

Loren watched the Randy Oliver video a few times and decided to take the challenge to accept Randy's invitation to modify the container-building process. Loren built a simple jig with a nichrome wire for cutting the bottom off the plastic cup which will contain the screen. Taking a clue from Randy's observation that a screen near the bottom of the cup produced a better swirling action, he cut the bottom off the cup below the lower ridge which is approximately ¼ inch above the bottom of the cup. Next, he drilled a 2 5/8 " (67mm) hole in a 5 7/8" long piece of 1x6 cedar that will shape the screen to

properly slip into the bottom of the cut cup. Finally, he cut a 5 7/8" long piece of 2" inside diameter PVC pipe (2 3/8" outside diameter) to press the screen into the hole in the cedar board.

Loren had just begun to make the alcohol wash cups when a beekeeper neighbor stopped by with her daughters. Jordan, the 5th grader, asked Loren what was happening in the shop. He said, "Are you serious? Do you really want to know?"

Jordan said, "You bet!"

Jordan's 9th grade sister Dylan was also curious about the project. Ten minutes later, we were building 60 cups distribute to members of the Missoula, MT, and Bitterroot bee clubs. Dylan and Jordan impressed members of both clubs with their eager willingness to help and their high quality work. Loren was very grateful for their assistance, but not surprised by their attitudes because they're always willing to pitch in and help! This is what the multistep process involved:

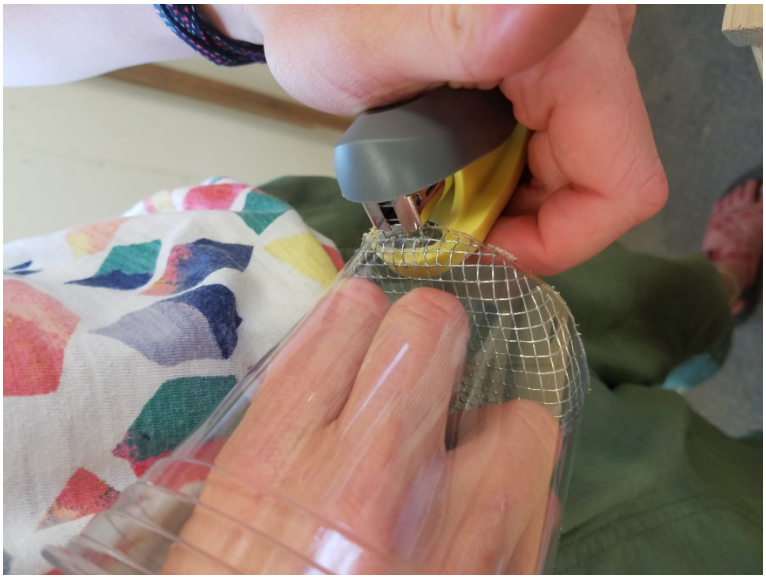
Dylan and Jordan cut #8 hardware cloth into 3½ inch strips (89mm). (We suggest that you use a 24" length which makes 6 screen blanks. Cutting more than 6 layers of screen at one time is difficult.)

Loren uses a 10" tin snips to cut through 6 layers of #8 hardware cloth. Place a 3 ¼" diameter paper template (83mm) on the long strip of hardware cloth approximately 1/4 inch from the end of the cloth. Fold the hardware cloth over the paper template so the fold is at least another ¼ inch longer than the paper. (The extra distance between the paper template and the folded edge of the hardware cloth makes it much easier to make an accurate cut.)

Dylan cuts the bottom from each screened cup using an 18 gauge nichrome wire jig. (Cut the cups outside and don't breathe the nasty fumes of the burning plastic.) We attached the clamps from a manual battery charger **on the 6 volt setting** to the two bolts which hold the nichrome wire.

Jordan presses the screen into the board, rolls the PVC pipe a couple times to properly form the screen, and pushes it out the bottom of the hole.

The key to a smooth process is a nicely shaped screen.



Dylan staples the screen to the bottom of the cut cup.

And the finished product….

If you want to build your own cup kit…..

Materials (We recommend using a low density wood like pine or cedar. (We prefer a 1x6 cedar fence slat that is planed on all faces and a full 1" thick.)

Plastic cup cutting jig:

Base - 1x6 5 7/8" long

Vertical 1x6 3 7/8" long with:

2 @ ¼" holes drilled 1" from the top and sides of the Vertical board.

2 @ 5/32" holes drilled ½" from the bottom and ¾" from the sides to accept two 2" long sheet rock screws.

Wire screen shaping jig:

Base - 1x6 5 7/8" long

Drill a 2 5/8" hole in the center of the board using a hole saw similar to this one at Home Depot. Clamp the board securely before drilling to prevent injury!!

PVC shaping cylinder:

Cut a 2" inside diameter Schedule 40 PVC 5 7/8" long.

Miscellaneous parts:

2 @ 2" long sheet rock screws
2 @ 1.5" long ¼" carriage bolts
8 @ ¼" flat washers 1/16" thick
2 @ ¼" nuts
24# wide #8 hardware cloth (1/8 Inch screen)
18 gauge nichrome wire
An old fashioned battery charger with a 6 volt setting

Assembly:

Place the Base board on a flat surface. Place the Vertical board on the flat surface with the ¼" holes on top, with the Vertical board flush against the Base Board. Screw the sheet rock screws through the Vertical and into the Base.

Push the ¼" carriage bolts through the Vertical board with the heads of the bolts above the Base. You may have to tap the head of the carriage bolt to drive the head flush with the Vertical board. Put three of the ¼" washers on both of the bolts. Cut a 6-7 inch long piece of nichrome wire and wrap it around one of the bolts. Slide another washer onto the bolt. Thread a ¼" nut on the bolt, and tighten. Stretch the wire around the other bolt. Slide the last washer onto the bolt, and tighten the nut.

Lessons learned:

1. We used 22 gauge nichrome wire for our 1st test. Although the wire cut the plastic cups nicely, the wire broke after 5-10 cups. The 18 gauge is much more durable. We were able to cut 9 cups in a minute with the jig.
2. Although you should stretch the nichrome wire tightly as you wrap it around the bolts, the wire will stretch about 1/3 inch the first time you heat it to red-hot temperatures. The first time you attach the battery charger clamp, hold a screwdriver or pliers between the wood and wire and guide the wire downwards, keeping the wire about ¼" from the wood.

We're considering making the kits and selling them to clubs to make it easier for hobbyists to accurately document their Varroa numbers. If you're interesting in purchasing a kit, please contact Loren Stormo at loren.stormo@gmail.com .