Apis m. Esoteria 9

Powdered Sugar Mite Control

Using powdered sugar to control varroa mites has been around since 2005. I have no idea who thought it up but several scientific studies have shown that it might (mite) work. A side note is you must have a vague idea of economic threshold and integrated pest management (IPM). IPM is using all the methods to manage a pest but use the least necessary technique first. We don't shoot rats in the house with a shotgun! "Economic threshold" is the point where pests get so numerous they impact on the economic return of the situation. One rat in the bedroom is a pet. When the rat is eating our honey on the kitchen counter it is a pest. When there are so many rats that the black plague becomes a problem, we need to do something.

The first question we have to ask is: Will it hurt our bees? The answer is: Yes, No, Maybe. The fine sugar does no harm to the bees. The small amount of corn starch used to keep it from caking may cause some damage to the larvae. If enough corn starch gets into the open cell with a larva at just the right age, I suppose that it could desiccate (dry) up the larva. In most cases if you lose a couple hundred larvae per treatment but knock out thousands of varroa mites that is a good trade off.

The next question is: Will it affect the hive, contaminate honey or comb, or leave residue? The answer is: NO. The bees will clean up the excess and mix it with the honey. The small amount of corn starch will not be noticeable in the honey by changing the flavor or making the honey sugars crystallize at a different rate.

OKAY, what does it do? It knocks the mites off the bees! Bees do not like to be dirty. When they are dusted with the powdered sugar their grooming activity goes into high gear. You do not have to dust all the bees. They will all start grooming each other and knock the mites off their sisters. Some people say the mites just can't hold on to the dusted slippery bee. Personally, I don't care how they fall off. This is where the type of bottom board you have in the hive matters. If you have some type of open bottom, the mites fall to the ground and are gone for good.

Someone thinks the ants love them. That is fine with me. Does the sugar that falls through the hive attract ants under the hive? Maybe somewhat, but they do not become a problem.

The “old” technique to apply the powdered sugar is to dust the bees once a weak for four consecutive weeks. This schedule will break the number of adult mites available to enter cells during the larval period. After the four-week cycle the mites are reduced below the economic threshold. Do this in the spring before nectar flow and in the fall after honey collection. Some people say you can continue during honey collection since there is no honey adulteration. I personally stop during honey collection because the difference in sugar crystal size between honey and powdered sugar with corn starch may cause the honey to crystallize.

Open the hive during a periodic inspection. Disassemble the stack of supers and hive bodies, down to the bottom one. Sift (with gramma’s old flour sifter) the powdered sugar on the top bars generously. You want to get it on most of the bees. You don’t have to put it on like cake frosting (too much) because of the bees start grooming each other, whether they have powder on themselves or not. So, this is maybe ¼-1/2 cup per layer. Less will limit the number of bee larvae that get desiccated in the cell. Use your bee brush and sweep the powder off the top bars so it drops through the space between the top bars. Place on the next upper box and repeat until the hive is restacked. Repeat the four-week process if necessary after sampling the number of mites in the hive.

This technique was scientifically validated. Don’t concern your self with the statistics and how the numbers work. The results showed that the mites were greatly reduced. The test compared the number of mites to the population of bees. When the mites were approaching the economic threshold (the period before colony collapse) an application of powdered sugar on the above described schedule reduced the mites to 1% and the mite population stayed down longer than when Checkmite (fluvalinate) or Apistan (cumophos) were used. The chemicals reduced the mite population to 2% but had side affects within the hive.

The “new” technique only changes the time of the year that the powdered sugar is applied. The latest study was conducted at The University of Georgia (hurrah!).

It showed a much higher rate of mite drop. Treat the bees after all brood raising stops in the fall. All the mites are present on adult bees and available to be knock off during grooming sessions. There are no open cells with larvae for the adults to enter and no capped brood to protect the adult and immature mites during treatment. Although not part of the study, there will be no affect on larvae because they are not present. You do 4 consecutive treatments over a 4 day period. This just insures excellent coverage of the entire bee population. When you do a treatment, some bees are out foraging. I would think an evening treatment time would get more bees at a time. Morning treatment would be equally as affective but the temperature in the fall is lower in the morning and you may not want to open the hive at the low temperature. Mature bees can withstand the low fall temperatures longer than larvae. This gives you a little longer window to work in, thinking about the typical hesitation to open a hive a less than 65 degrees (or keeping it open a long time to do the work). You still would want to work quickly and efficiently below 75 degrees.

If you can't open the hive four consecutive days because of outside temperature, I think there would be minimum impact by having a longer period between treatments. The mites are not reproducing and they cannot hide. You would knock some of now and more off later. The net gain would be similar.

Okay, I am a chicken at heart. Should I wait until all the brood is finished? Yes, you get all the mites which is good for next year (spring brood time). HOWEVER, you have allowed the late season bees to hatch weakened by the mites during the larval stage in the cell. These bees need to be as strong as possible when they hatch to make it to next spring. At least for the first year I am going to reduce mites using the "old" way when it is warm in the fall. Then I am going to use the "new" technique to eliminate the mites for next spring.

Where do the mites come from? Drifting bees! Those dastardly drones that wander from hive to hive or confused bees which reenter the wrong hive. They will be allowed in if they are carrying nectar or pollen. The new bees (queens) that you purchase have been treated, but not all mites are eliminated.

The UGA study was conducted to double check the same research done at the University of Florida. The Florida study showed no reduction in varroa mites. Ironically, in Florida there is no time of the year that there is no brood in the hive. That means the Florida study was mostly a validation (or not) of the “old” technique.

If we treat thoroughly, late in the fall when there is still significant brood. We should allow the wintering over young bees to be born healthy. Then after all the brood is hatched out, we treat again to “eliminate” the mites on the adult bees. In NE Georgia this should be between Thanksgiving and Christmas. Since you won’t disturb the cluster you can open the hive and dust on a fairly cool day.

The first really good news is that this is varroa mite control with no residual chemicals in the hive. The second good news is that you cannot find a cheaper treatment. The third is that it is a mechanical type killer. Much like killing the rat with a hammer. The mites can not become resistant to the treatment. Some essential oil treatments work mechanically also, but they cost more and are hard to find and use correctly.

I am a “Powdered Sugar Man”. Or am I just basically sweet.

Note: It is now March 2013. My system is not fool proof. I have suffered fairly high late spring losses. The Mysterious February die off. Winter of 2013 I will try Apiguard and Oxalic Acid early and then test for mites before Christmas.

Updates Spring 2014 equals no change in losses

Update Winter 2017 the scientific community is pooh poohing powder sugar treatment. If it knocks off any mites it is a help, but I am looking to oxalic acid fumigation as a better way to go

Update spring 2018 looking to Randy Oliver, oxalic acid paper towel as the way to go.

Update winter of 2020 the world has given up on powdered sugar treatment. Formic Acid and Oxalic acid treatments seem to be very effective with little adverse impact on the queen