Ventilation: It's Complicated!

by Susan Chernak McElroy

"My bees are hanging out all over the front of the hive! (called 'bearding')!"
"It's so hot my combs are falling!"
"There's condensation dripping down the glass on the viewing window!"

Any quick search will turn up many articles online about ventilating your bee hives, including the use of screened bottoms, off-set hive lids, wide-open summer entrances, multiple ventilation holes, side and lid insulation, and more. But are our ventilation manipulations really helpful to our bees?

I think it's a natural tendency to relate to and empathize with our bees. I feel these qualities are what makes us able to feel compassion for other creatures—which is a good thing!— and I'd bet that everyone reading this cares deeply about their bees.

Sometimes our bee empathy can lead us astray, however, and I believe that hive ventilation is a topic where we can easily fall off the good bee road. I'll admit that I'm a card-carrying anthropomorphizer and proud of it. But even I must concur that creatures with six legs and exoskeletons have a very different life experience from mine.

For instance, my ideas about what constitutes acceptable temperature, humidity, and ventilation ought not to be transposed onto my bees. While it feels utterly unnatural to me, bees like a hive that is moist and hot—like New York City in middle of summer.

Bee brood needs to be kept humid and very warm (89.6 to 92.6 Farenheit). Even mild fluctuations of a mere half-degree inside the colony can weaken and retard developing bees. When we open our hives, for instance, house bees rush in to warm the brood with their bodies and continue activities to restore the heat and humidity among the brood combs until the required temperature is restored. It can take them days to restore the hive atmosphere.

Varroa mites do not like these high and hot temperatures, nor the wet of condensation and perhaps our bees understand this. In fact, there is new technology (http://thermosolarhive.com/en/benefits-2/elimination-of-parasitic-mite-varroa-destructor/) that involves heating hives up to the temperature that will kill these mites without damaging the bees or their combs.

Bees construct their comb in a way that optimizes their ability to regulate temperature and humidity. They will cross-comb (build wavy comb across one or more frames or bars) to create a much more stable comb in hot weather, and to move air in their preferred pattern throughout the hive. At the hive entrance at different times of the day—or season—you can actually "feel" the hive breathe as she takes in air and then expels it, sometimes quickly, sometimes over the course of a day. Combs and their arrangement are the lungs of the hive.

Often when beekeepers see condensation dripping down the insides of the hive, we get panicky. I mean, who wants water running down your walls? But bees like—and use—this condensation. It is an integral part of their inner hive HVAC system. (http://biobees.com/forum/viewtopic.php?t=11035&highlight=ventilate&sid=ddfbfc7180bcbf512327d58c2307ff7e) When there is condensation in the hive, the bees have a water source at their lips (if they had lips), and the colony needn't waste precious forager energy on water collection.

We may also become needlessly concerned when we see our bees bearding by the thousands on the outside of the hive during the summer. "Oh my! My poor bees are so hot they can't even bear to be inside the hive!" Actually, it is perfectly bearable in there, but the house bees have indicated that too many bee bodies will disturb the temps needed for brood, and for nectar evaporation, so many of the hive bees are sent by the Hive Mind to camp under the stars at night.

Left to their own devices, bees are more than capable of creating and maintaining their complex hive atmosphere. And the operative word of that last sentence is "complex." Our bees have so many different tasks throughout the seasons, all requiring different temperatures and different

patterns of air flow. It would be impossible for us to imagine the mind of the superorganism—the colony—that regulates all these complex adaptations.

Remember that whatever the colony does inside the hive, she does it slowly and by small degrees. When we intervene to help our bees by increasing/decreasing airflow, adding new ventilation holes, or even poking around inside our hives, our actions create a swift and abrupt change within the colony, a change it may take the bees a better part of a week to ameliorate.

I'm all for helping my bees, but I am not wanting to add more work to their already busy lives. From the reading I've done, and by watching my own hives extensively, I'm offering some ideas to consider when the warm weather arrives and starts making your fingers itch to help your bees. Wait a moment before you crack that lid!

- -Bees like small hive entrances, all the time. Beekeepers often find that when we add additional openings to let in some air, the bees hurry to close them. Small entrances are easier to defend in any season, and minimize outside weather intrusion.
- -Bees prefer to construct their comb in ways to maximize hive atmosphere. This is difficult for beekeepers who need to be able to quickly inspect their comb, but it is a serious trade-off for bees. Straight comb requires much more work for the HVAC bees. And is much more inclined to collapse in hot weather.
- -Ideally, the less influence the outdoors has on the inside of the colony, the less stress the bees must endure to maintain the parameters important to their health. To me, this means we ought to be pondering how to craft hive bodies that have similar insulation values to thick trees. I'm making woven hives (skeps), but also thinking about insulating panels for the top and sides of my top bar hives, and not only to use in winter, but in summer as well, giving the bees a colony space that mimics their natural behavior in a wild tree.
- -Open your hive only when you truly need to. Think of the temperature inside as a precious commodity you don't want to waste.