

Pay Attention, Ask The Right Questions

Learning What Is Going On Requires A Lot Of Observation

Larry Connor

We expect newer beekeepers to lack a comprehensive depth of knowledge of bee behavior and bee biology, but it is particularly unsettling when a person who has kept bees for a number of years reports on something they have seen in a hive, and their conclusion is just wrong. This discussion focuses on the need for beekeepers to Look and Observe what the bees are doing both inside and outside the nest, and then asking the Right Questions about what they see. From this Observation/Questioning behavior beekeepers can become much more confident in their beekeeping.

Landing Board Observations

Watching the bees at the entrance of a hive is an excellent way to learn a great deal about bee behavior if you take the time to make good observations and then look inside the boxes to correlate outside activity with inside observations. Whole books have been written on making observations at the landing board and drawing conclusions based on what is seen at the entrance, so consider this an introduction to the subject. So it carries a huge CAUTION label – make sure that what you think you see IS correlated with what is actually happening inside the box! Just because you see bees flying at the entrance of the hive in large numbers does not mean that the colony is swarming!

So many new beekeepers are terribly impatient with their bees, hustling around the hives and going snap, snap with their fingers as if the bees were paying attention to our need to understand what is happening in the hive. So let's take a block of time, many 30 minutes, maybe an

hour, and watch what is going on at the hive entrance. And let's do it at different times of the day, from early morning, mid-day to late afternoon and evening. California friends have afternoon drinks on the deck with a colony of bees they keep there. They can observe what the bees are doing at the same time of day as the season progresses while relaxing after a busy day.

Imagine it is August in the Northern Hemisphere, and, holding that fact in mind, what might we see at the entrance. We find a comfortable place to sit off to the side of the hive, in a chair or on the ground. Position yourself so you are not in the flight of the foragers. Bring along a mat, a drink of choice, and a good camera with a macro option if you have one. Pretend you are the person you watched in a beekeeping documentary, and you are going to meditate in front of the hive. Be that person. Relax, follow your breathing, breath out a few demons as you watch what is happening as the bees fly in and out of the hive. Let the bee activity replace your laundry list of issues, and let's meditate on the workings of the bees.

Now focus on what the bees are doing. Can you tell if the bees are collecting pollen and nectar? The pollen should be pretty easy to determine, since they carry the evidence of pollen foraging on their hind legs in the pollen baskets, or corbiculae. If the bees are flying back into the hive a bit too fast for you, lean a queen excluder at the entrance so the bees are slowed in their return to the hive. You will quickly see how many hundreds of bees are leaving and returning to the hive in just a few minutes. This will



Hosta is a popular garden planting, but few of us realize that honey bees find the pollen very attractive.

give you a chance to see the color of the pollen loads, and even put a small dab of paint to mark certain bees. Use a small paintbrush or a paint marker. Bees usually collect pollen of several colors reflecting different plant species in bloom at one time. There is often one dominant color. In my early August apiary a white-ish pollen indicates that the spotted knapweed (star thistle) is still in bloom and providing pollen for the bees. A friend of mind is an environmental goodie two-shoes and wants this invasive plant to be eradicated, but for me it is a valuable nectar source for the bees in the Great Lakes area and its loss would have a direct impact on the state's honey production and thus beekeeper income and sap colony strength for crop pollination needs. Decisions are never easy. **We need more diversity of bee forage, not less – so don't remove a valuable plant without having several in line to replace it!** (My friend passionately pulls the knapweed out of her 'natives only' gardens, while I scatter knapweed seed wherever I am able).

If there is whitish pollen from spotted knapweed, it probably means that the bees should also find some nectar from the flowers as well, and there will be bees that fly into the hive deliberately with a full load of knapweed nectar to process into honey, with a distinctive flavor that is slow to granulate. Of course, not all pollen producers are also nectar producers. As you grow in your beekeeping experience you may carefully capture a few returning forages and gently squeeze the abdomen so the nectar in the honey stomach is regurgitated onto the plate of a nectar refractometer, and you can measure

the sugar content of the nectar the bees are gathering.

Debris removal

What are the bees removing from the hive? Are they carrying out the trash you added when you added combs from dead-out colonies? Are they removing brood that was killed when you separated the boxes and the burr comb filled (usually with drone larvae) were torn apart? Or are there small grey and white mummies of bee larvae, a certain indication of chalk brood (a fungus) inside the hive? If the bees are pulling adult drones out of the colony you have been notified that the nectar flow is over, at least for now, and the bees are slowing down their season.

Drone activity

In fact, you can use drone brood and drone activity as a means of estimating colony conditions:

1. Bees are removing drone larvae and pupae: There is a shortage of food in the hive, and the bees are trimming the brood nest.

2. Drones are flying at the entrance, but don't seem to be going anywhere: this is cleansing and orientation flight of the drones.

3. Drones are leaving the landing board and returning unrestricted: The boy bees are actively flying to drone congregation areas, and those unsuccessful in finding queens have returned. This is in the afternoon of sunny days.

4. There is a huddle of drones at the entrance: The flow is over and the workers have locked their brothers out of the hive. Workers may tug at returning drones and pull them away from the hive.

5. One colony has drone flight and the rest of the colonies in the apiary have none: This is a good indication that the colony with flight is either queenless or undergoing queen replacement. Early in the year this may be the only colony that has plenty of food and bees able to produce a large brood nest and early, abundant drones. Watch for swarming if you see this – it may be just a few days away

Inside the Hive

This is always where beekeepers should put their full attention. So many beekeepers focus on finding the queen when they visit their

Honey bee at twilight, waiting for the Moonflower to open and expose its rich pollen to the bee. Bees of various species will push the petals apart and crawl into the flower before it opens. Bees are not patient when it comes to food gathering.



hives – one mark of an experienced beekeeper is the ability to sort out the different messages a colony provides to tell you that the queen is present and all is well inside the hive without finding the leading lady every time you open the colony. The presence of eggs in worker cells, normally laid eggs, one in the center of each cell, is the best indicator that the queen is both present and performing her duties.

Other observations

1. Swarming is predicted by drone development in the spring and a strong buildup. Then there may be a reduction in foraging a day or two before swarming, with a large number of bees at the entrance.

But this may also be directly related to crowded conditions when

swarming is not yet on the bees' behavioral radar.

2. Heat management is a critical issue at the entrance of a hive, especially if there is no other ventilation for the colony. Large numbers of bees will be fanning at the entrance to cool the hive, and help with nectar moisture removal during the nectar flow.

3. Robbing can take place anytime of the year but is usually associated to conditions when the flow is not underway. But many of us have watched bees rob out empty frames or hives early in the day (or late) during the nectar flow.

Field Observations

How do you know what plant produces a particular pollen color? You need to take a walk in the fields and woodlots and find where the bees

Inside the newly opened moonflower, the forager collects pollen and rapidly packs the white pollen onto her hind legs.





Rose of Sharon flowers are attractive for their pollen production. Considered a weed by the USDA, this hibiscus species is popular with urban and suburban gardeners. Some sterile varieties are available, and will not overtake the garden with seedlings!

are gathering food and recording the color of the pollen. Dorothy Hodges, a British woman wrote a lovely book called the *Pollen Loads of the Honey-bee* and she spent hours in the field carefully mixing and matching her watercolor paint to the pollen colors of the bees. The watercolor sheets were used in the book as small pieces of paper hand glued into position to match the pollen. We do not all have to become as focused as Dorothy Hodges, but we can certainly learn from her passion and interests. The first edition of her book has become highly collectable because of the hand labor involved in its production.

There may be other plants in bloom, depending on where you live. Texas beekeepers may see pollen from some of the many composite flowers that flower in the Fall but only if there has been adequate rain. In cities and suburban beekeeping settings you are likely to discover bees gathering pollen from plants usually not listed in the beekeeping books – flowers like the ever popular Hostas, or Rose of Sharon (*Hibiscus syriacus*) or *Datura innoxia* (Moonflower, thorn-apple, Indian-apple).

For the Moonflower (thought to be native to Central America and South Florida), you will need to be at the flowers just as the sun is setting and the flowers open and the bees, attracted to the strong floral scent and the reward of the rich pollen loaded on the anthers, will struggle to break into the flowers as they rapidly expand (rapid for a flower anyway) and crawl to the waiting pollen inside the flowers. Bees amaze me by having a great sense of time regarding floral development (phenology, the study of life cycles as influenced by the seasons, time of day and/or climate), as

they will fly to the flowers just a minute or two before the flowers expand so they can open. It is important that they be the first bees on the site since other bees can quickly remove the pollen before it is too dark to forage. The window of opportunity for the bees to collect this pollen each Summer evening is about 30 minutes, not a very important pollen source! Some folks get excited about these flowers because someone might eat the seeds and get sick and die. To do so they will have to get past the nasty seedpods the flowers produce after all that pollination. I guess that some night flying and tropical pollinator is the natural pollinator of these flowers, and honey bees are filling a void, or rushing to finish first! The number of seeds these plants produce is amazing, and I have to be pretty careful to pick the seed pods before they mature or plan on a lot of weeding the next Spring!

The Rose of Sharon is native to Asia-China to India. It is a weedy bush that produces several colors of pink, white and lavender flowers in the Summer. The bloom extends over several weeks, and adds color to my garden when other plants have finished their cycle. These attractive temperate hibiscus flowers produce

pollen attractive to many bee species. I have not observed nectaries or nectar gathering. My house had these planted as a hedge, and if I did nothing in my back yard it would become a Rose of Sharon forest. The plants are considered weeds by the USDA Forest Service.

Hostas are from Japan, China, and Korea. They are planted for their attractive leaf display, but produce long stems of blossoms. The flowers have long flower tubes, and that tells us that these are not honey bee pollinated flowers. But the attractive pollen-laden anthers are very attractive to honey bees, in part because they bloom form mid to late Summer when other pollen sources are more difficult for the bees to find.

Variations

In many parts of the country there will be a different set of behaviors at the hive entrance. There will be a number of bees sitting on the landing board or entrance of the hive with their front legs up against their bodies and their hind legs firmly holding down a section of the entrance. These guard bees are waiting for intruders, perhaps a forager that has miscalculated the entrance (she will be allowed in), but more likely a pesky robber bee, a forager from another colony that is attracted to the honey odor of the hive and will attempt to enter the hive if not challenged by the guards.

The mark of 'experienced' beekeepers exists in their ability to look at a particular bee behavior or colony condition and correctly determine the behavioral cause of the event underway. Further to their well-honed skill set is the ability to admit that they do not recognize the problem, but know something is not right. It is pretty amazing to see beekeepers who think they are experienced but have absolutely no clue what is happening with their bees. It is commonly seen during buildup and swarming seasons, but also during the later times of the year, when the forage is limited or over, and hive conditions have changed drastically. **BC**

Going to Hawaii for the Western Apicultural Society meeting? Plan to stay one more day for the Master Class Dr. Connor will teach just north of the WAS meeting site. For registration and program information go to www.wicwas.com.

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