

Prior to the August Western Apicultural Society meeting in Healdsburg, California, I was invited to speak at the San Francisco Beekeepers Association and conduct a mini-queen rearing course. During the time of the class I was able to learn about beekeeping conditions in this very unique habitat.

Actually, it is a series of habitats. There are bees on the roofs of buildings that seem to benefit from the solar reflection of the dark, tar roof. There are bees in the back yards of tiny lots that are surrounded by fog for many hours each day (or even for days) as the central valley of California heats up and pulls cool, moist Pacific air into the city, creating weather that is dramatically different from surrounding areas. While it may be in the 90s or warmer just a few miles away, weather conditions in San Francisco may never get much past the low 70s for days at a time. How do bees deal with this unique climate? This is not a random question, as more and more urban beekeepers deal with sometimes marginal beekeeping conditions in coastal cities around the continent.

Bees were flying in the 50s (F), reflecting either an adaptation to the cooler climate, a nutritional desperation because of a pollen shortage, or an abundance of rich nectar and pollen within a short flight range. Perhaps it was a combination of all these factors. Local red gum trees (an imported eucalyptus) were making a dramatic display just a block away along side of a school. The bees were swarming over the blossoms as the temperature increased on a typical sunny day in August. The flowers have cups filled with thick, syrupy exudate I took as sweet nectar. The bees were fighting to get into the flowers to reach the nectar, and there were some bees covered with pollen as they scabbled over the flower tops to harvest just pollen quickly and efficiently.

In this city there are as many SFBA member beekeepers as belong to many state organizations, and the recent interest in new bee keepers is remarkable, with emphasis on reducing swarming (somewhat unsuccessfully, as reported by some of the SFBA members), and the growth of community gardens throughout the city. It is an interesting paradox that the city supports so many interested

If You're Going To San Francisco...

Larry Connor



in beekeeping yet the nectar season is designed to challenge.

San Francisco has two peak forage periods, before July and August, and then after the central valley cools and the cold draft from the Pacific is reduced. Tour guides advise visitors that September and October are the best times to visit the city, when the temperatures are comfortable and the sky sunny and bright. This tells you a great deal about the conditions facing the bees and the beekeepers.

The May and June buildup period is not that different from the surrounding regions, and after the city's pear, plum and other fruit trees

have completed blooming the colonies have reached a large population and, as in the case of 2009, a number of colonies were programmed to swarm, and did in large numbers.

Swarm management in a city is essential for good neighbor relations, to avoid the bees that are temporarily regrouped on a local tree while the swarm's representative bees take a collective vote and decided on the location of their next home. Then the bees move into the walls of houses and outbuildings. Large numbers of swarms in the city is not a good idea because of the close contact with the large human population.



The cool and damp Summer weather in San Francisco makes it a challenge for the hundreds of beekeepers that occupy the seven by seven mile city.

There is another risk of swarming behavior in foggy San Francisco, as there is a potential queen mating failure when beekeepers use the swarm cells to start nucleus colonies. There are parts of the city that will not support good queen mating conditions. Cool, foggy, and very windy conditions are not suitable for good mating. When the changing conditions of the Summer months arrive, colonies may need to be moved to more protected areas to insure queen mating. For urban beekeepers, some who rely entirely on urban transportation, this can produce a unique challenge due to the lack of a means of moving bees. Putting screened colonies on hand trucks and taking them on BART (Bay Area Rapid Transit) is generally not recommended, so wise site selection is key. Some beekeepers respond by limiting their queen source to the purchase of already mated queens obtained from the abundant California queen producers that are located in the central valley. Others focus on developing a queen family adapted to the conditions of this unique climate, and are careful to set out small groups of mating nucs and increase nuclei in various areas of the city so they can identify the best places to mate queens.

Because of the unique flow conditions of the city, it seems logical to develop a localized queen for this city, and to find the best place for mating. Perhaps drones can be produced early enough to provide all the mating that is necessary before the cool Sum-

mer weather arrives. Lacking this, it may be useful to explore the mating of queens in September and October, since there are red gum trees and other plants that bloom from August on and into the Fall months. Then the risk is having abundant right-aged drones for successful and diverse mating. If the drones are present, a small queen rearing operation with just three or four colonies might serve the local needs of SFBA members, and could be easily developed, producing queen cells that can be easily distributed among the beekeepers of the seven mile by seven mile city. A quick discussion with one beekeeper from the city suggests that there may be a density of 20 to 30 or more colonies per square mile in the city, certainly as dense an area as found in many honey producing regions.

A mating plan, run by the SFBA or a few individuals, would allow a diverse supply of unrelated drones to thrive in the city in the hives of member beekeepers, ultimately mated to a smaller group of queen lines that are found to carry on desirable traits for colonies in the city.

What traits does a city like San Francisco need in her bees? Certainly the region needs a very gentle stock or stocks, bees that will not initiate stinging even if provoked by marauding herds of miss-directed teens. It seems inevitable that African bees will continue their way up the state of California and establish themselves in the area. The most successful counter balance will be a strong bee-

keeping community keeping 'friendly' bees with some degree of adaptation for the area.

Unlike other parts of the country, the bees in San Francisco do not deal with Winter, at least not in the traditional fashion. Colonies may not even stop brood rearing in December or January, depending on the race or genetic makeup. They are in a region with at least 10 months of forage weather, and the plants are amazingly diverse and quite abundant, perhaps one of the most varied groups of bee-friendly plants I have found in one concentrated area. Any stock that is able to respond to this set of conditions and opportunities will do well as long as it does not consume too much of the honey it produces.

In the backyard apiary I visited there were many bees on the ground, deformed, spinning, dying or showing some form of distress. Young drones were crawling on the ground during morning hours, something I did not expect to see in any apiary. What is happening here?

The beekeeper was not using any form of *Varroa* mite control, explaining at least some of the symptoms. There were bees with deformed wings, a condition caused by one of the viruses associated with *Varroa* feeding (not necessarily transmitted



Small lot sizes in San Francisco make it a challenge to keep bees. This apiary is mainly filled with increase nuclei hives made up from full-sized colonies. Queen mating has not been successful here, so the beekeeper uses California queens to head the colonies. This was a rare sunny

by the mites, but providing opportunistic wounds where feeding has occurred).

The spinning bees are more of a question. Are they bees that have been exposed to near by pesticide treatment, and this spinning is a neurological response to a sub-lethal (or not yet lethal) exposure. As far as the bee is concerned, its useful life is over. Or is this a symptom associated with *Nosema* or *Acarapis*?

The presence of young crawling drones is an especially interesting. These were young drones, abdomens soft to the touch and not yet sexually mature. Are they being rejected by the colonies, or by a few of the colonies? There is no way to accurately predict drone rejection in the post-summer solstice months of the year, as the days get shorter the worker bees seem to justify any excuse to reject drones. But young drones? Bees usually keep the young drones, those coming into their sexual utility, and reject older drones. However, the older drones may be already gone from this location and the colony is working down the line to the usually favored young drones. Perhaps the previous days of cold, foggy weather reduced the colony's pollen reserve to the level where the drones were the next to be rejected.

Two things need to be done with the colonies in this apiary, in my opinion. First, the beekeeper needs to determine the mite levels in the colonies and nuclei hives by either the ether roll, or by using one of the powered sugar testing methods. Since the colonies were already equipped with screened bottom boards I would enthusiastically endorse the use of a simple powered sugar treatment once or twice a week for four weeks to measure the colonies entire mite population and, if a sticky board is used, to remove the mites from the population. The powdered sugar quickly removes most of the adult mites feeding on worker and drone bees, perhaps in as quickly as ten minutes. This fast and relatively safe method of mite sampling AND treatment uses one half cup of powdered sugar per deep hive body (one cup for a double deep or three medium deeps). Window screen is placed on the top of the brood nest and the sugar spread with a bee brush. The screen is then removed and the sugar that has fallen onto the tops of the



Close up of red gum tree flowers.

frames is brushed into the spaces between the frames. IF the screened bottom board has been cleaned and coated with a cooking spray before the sugar treatment, the mites will stick to the oil and can be scraped off after they are counted. Remember, between 80 and 90 percent of the mites are in the brood cells, so the mite count only represents just 10 to 20 percent that are in the adult bee feed phase. This is why it is necessary to return to the apiary once or twice a week to retreat and count. Add all the mites that drop in a one month period and record this in your data file so you can compare this with other colonies and from season to season.

My other recommendation is to start a protein-feeding program on

colonies that are being kept in cool conditions in San Francisco and coastal areas like it. This is true for colonies in other areas that are undergoing a cool season (part of the Summer in Michigan has been unseasonably cool). I do not have any data to recommend one protein mix over another, and in my case I am using what I could find at a beekeeping trade show! I suggest using the premixed protein patties at the rate of ¼ pound for small nuclei to 1 pound for full colonies, offered every week as feeding indicates. If a natural pollen flow restarts and the bees are filling frames with bee bread, the feeding rate can be reduced by not stopped if there is any risk of a break in foraging due to weather or plant production. It is absolutely essential that Fall colonies receive good protein nutrition so the bees that carry the colony through the Winter months are extremely well supplied with fat cells in their bodies.

On the roof apiary with another SFBA member, the bees had good sun exposure and wind protection. The back tar of the roof may create some thermal control of *Varroa* mites. It is known that *Varroa* mites are not as reproductive in warm, dry colonies. I hope to follow up on this idea, since the use of a dark material to place bees on for mite control could be used in many regions of the country, not just in San Francisco. **BC**

Check out www.wicwas.com for Dr. Connor's meetings in Michigan in October and Texas and Connecticut in November.

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