

## Winter Preparation

It's raining so it must be August. It is time now to start preparing for winter for those of you for those of you that plan on doing so. As the cost of bees keeps going up, I expect that many more beekeepers will exchange the convenience of package bees for the cost savings involved in wintering. Statistically, most bees die in the wintertime due to starvation. Many beekeepers concentrate on management of colonies and worry far more about varroa, tracheal mites, and other brood diseases, but in reality most of the time the bees starve out. Starvation happens from two methods. First is that they run out of food and there is none left inside the brood boxes. This is the most common type of starvation. This is simply brought on by the beekeeper not giving enough sugar-syrup in the fall for the bees to process into "honey." It is unrealistic to give the bees sugar-water in late September and expect them to render it into honey by the time it gets for them to move. Ideally, one should start feeding large quantities of sugar-syrup as soon as the honey supers are pulled for harvest. This gives time for the bees to process the ten gallons that they may need for the wintertime. Most bee books indicate that in cold climates you need 80-100 pounds of honey to get through the winter. This translates into at least 2 or possibly 3 large bags of sugar. That's a lot. For wintering several colonies, the difference between two bags of sugar or three bags of sugar is not a significant investment. I have always felt that it is better to make an error on the side of feeding too much than to have the colonies run out of food at the end of February. Excess sugar-syrup stored as honey is easily pulled in the spring if there is too much surplus in the hive. This can be used for fall feeding at the end of the season or extracted and saved for the same purpose if you need to use the combs. Beekeepers have many different methods of feeding bees. To get large quantities of feed into a hive, you may have to change the method by which you're feeding. I have found

that the inverted nut jar makes a great feeder in the spring. But it is difficult for the bees to get large quantities rapidly from this type of feeder. I prefer the frame feeders that hold about a gallon of syrup. These sit inside the hive and the bees can feed directly from a lake of sugar-water. Hive-top feeders are also good for the same purpose. One thing to mention about the frame-feeders is that the bees will drown unless there are some sticks inside it that they can climb out on. The other thing about the frame feeders is that they

take up more than one frame in the hive. They are commonly sold with the sales-pitch that they take up the space of one frame. In reality they take up the space of one and a quarter frames. This means you have eight frames in the brood box. I know of at least one beekeeper that has several frame feeders in the hive and feeds three gallons at a time. This seems to be a good alternative to trying to figure out what to do with the odd space. Open feeding is also a possibility. In this method, the bees fly from the hive to a place where sugar-syrup is available and it is carried back to the hive. Open feeding has some disadvantages that beekeepers should be aware of. Open-fed bees are in fierce competition for a very localized food source. This can lead to competition between the bees an attitude change (read this as a higher incidence of stinging.) Open feeding is a very convenient method of getting huge quantities into the hive in a very short time period. The big trade-off is the possibility exists that the hive will become aggressive and you or neighbors will be stung. Open feeding also can stimulate robbing behavior between hives when the sugar-syrup runs out.

Whatever method you choose in how to feed your bees, the key is to do it early enough so that the bees can process the quantity of food that they will need for the winter.

The other type of starvation is commonly called cold starvation. This occurs when the bees are unable to move to another area of the hive and run out of nearby food to eat. Remember that bees are unable to move if they get too cold and it is quite possible for the bees to have a long cold spell in the winter that keeps them in one spot too long. This type of cold starvation is addressed with insulating or wrapping your hives.

For those that are wintering their packages of bees, it is quite likely that the varroa load will be tolerable. It is usually the second year that varroa impacts the bees and mite treatments become more necessary.

While food is the most important consideration in wintering, the hives also need shelter from the wind and help in moderation of the temperature swings that winter brings. Moving the hives now to a more sheltered spot is a good idea. I think after three or four days of rain while the bees have been confined is a great time to move the hive short distances. Bees very often reorient after days of rain so you won't have the loss of bees that you would if you moved them during periods of sunshine.

Some people wrap their hives with additional insulation by nailing Styrofoam to the outside of the hive. This has been often cited as a help to get the bees through the winter. I know that it does help combat the cold starvation. Other things that help are wrapping the hive with tar paper or insulating wrap. One of the concerns deals with protection from the wind.

While bees can tolerate cold conditions, wind blowing into the entrance of the hive often is a stressful factor that may doom the colony. This is one of the reasons that many beekeepers wrap their hives prior to winter. Entrance reducers also help to moderate the movement of air through the hive. Entrance reducers also serve another purpose and that is to keep mice out of the hive. They too are looking for a warm place to spend the winter. They compete with the bees for food and also tend to annoy the colony creating additional stress that the bees do not need. Dead bees in the bottom of the hive are very common in winter. If you do use an entrance reducer, it is better to turn it upside-down, so that the slot is higher off the bottom of the hive. This gives space for the build-up of a few bees without blocking the entrance. An upper entrance is also useful for the bees, not only to get rid of excess moisture, but also it is less likely to become closed because of dead bees.

I have had fair success by placing the colonies tight up against the south wall of my garage. Not only is it sheltered from the wind, but it also has the benefit of the warming effects of the sun on that side of the building. You may want to look for this type of spot because winter is a couple of weeks shorter on that side of the house. Sometimes a couple of weeks is all it takes to make the difference.

Whatever method you choose to winter your bees, don't forget to follow the basic principles. They need food, protection from the elements, and ventilation for excess moisture. I have read numerous sources claiming that too much accumulated moisture is really hard on a colony. The upper entrance that is needed does not need to be too big. In fact if it is too big the bees will likely close it up with Propolis. A couple of square inches is all that is necessary in most cases.

Since I just finished this section on wintering your bees, I thought I would take a few moments and address the other option that we have. Many beekeepers chose not to winter their bees, but prefer instead to install fresh packages each spring. Whatever your choice, in wintering or not wintering, the logical decision time is in August. From a biological stand-point, a package of bees is best installed in clean drawn comb. That is, an already established hive, except without the bees. It makes poor sense to allow your colony to die out in the middle of winter and contaminate the hive with many dead bodies. The fresh package of bees will have to spend considerable energy and time removing bees and cleaning the hive prior to the queen laying eggs. This will slow the growth of the colony and impact honey production next year. If you decide not to winter your bees, here are some things you can do with them.

Your bees may be valuable to another beekeeper. Often times, it is desirable to draw comb for next year and get a quicker start than a person could from foundation. If you know somebody that is planning on having more hives next year, they can put your bees to work. They may also be interested in taking your bees and wintering them.

Another option is to kill off the bees before they die inside the hive during winter. There are a number of methods that are used to do this. Whatever method you choose, it should be as humane as possible. Some beekeepers shake the bees off of the combs during cold weather. Bees are unlikely to survive in temperatures below the mid-forties. Shaking the bees off the combs into soapy water will quickly kill them as well. A third method might be to use dry ice placed inside the hive in an empty super. Dry ice is carbon dioxide and will not contaminate the combs. Carbon dioxide is heavier than air so it is placed as high in the hive as possible and the hive is sealed at the bottom. As the dry ice melts, it displaces the oxygen in the hive.

Remember that wax absorbs chemicals very easily so avoid any chemical that you don't want in your food.

## **Equipment Storage**

It is also time to think about the best way to store away all the stuff that we used during the summer. Perhaps the biggest problem that we face is the problems that can be caused by the mice. Mice (or voles) can destroy frames of comb by chewing through them in search of food. The pollen that is mixed with or covered with honey is especially attractive to them. All of your equipment that is free of bees can be stored either inside or outside, as temperatures do not harm it. I prefer to store mine outside because I don't have room for the car in the garage if I include a few hives. Some beekeepers simply screen off the entrance with some hardware cloth that can keep mice out. One-fourth inch mesh works well for this and allows some ventilation to the hive. Moisture in the hive can encourage the growth of mold so it is a good idea to get some air circulation going through the hive. Having dry supers is helpful as there is very little mold that forms during storage. Placing the supers above the inner cover of your active hive will allow the bees to clean them up and dry them out prior to storage. For ventilated storage a metal queen excluder placed on the bottom board will do quite well with all the supers stacked over it. It will keep the mice out

and provide the needed air movement at the same time. A lot of wind can take its toll on freshly drawn comb if it is very cold during the time that the wind is blowing. I have had a few covers blow off in previous winters and the frames that were on the top super had many places where the wind eroded the fresh comb that had been drawn a few months before. Most beekeepers know that wax is very fragile when it gets cold particularly the comb that has not been used a few times for raising brood. The stack of supers that falls over in the winter wind is very likely to sustain damage to the combs. If this happens care should be taken in the pick up to ensure that there is no extra damage is caused by the beekeeper. If you are going to do some winter maintenance on your hives and plan on getting them from outside storage later in the winter be sure to bring them in on a fairly mild day to avoid damaging the wax. There are advantages to the colder weather maintenance though... propolis removal is very easy as it pops right off when it is frozen.

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