

From Joe Carson:

Wintering Honey Bees in Alaska

What is more detrimental, moisture or cold temperatures?

There are bee keepers who say that it is not the cold temperatures, but moisture that kills bees during the winter. Like so many other theories, this is a half truth. Yes, moisture is a greater threat to the bees while they are in the winter cluster than low temperatures are.

But cold temperatures can be killers, too! Over long stretch of severely low temperatures the stamina of the individual bee can be lowered.

Also, the effort to maintain tolerable cluster temperatures, plus the wear and tear of consuming abnormally high quantities of food, the conversion of that food into energy, tend to sap the strength and resistance of every bee in the cluster.

Repeated research shows that at approximately 57 degrees F. the winter cluster in the hive becomes well defined. As the temperature drops, the bees in the center of the cluster generate heat while the bees on the exterior of the cluster serve as insulators. From the time the queen begins to lay in early spring, the internal temperature of the cluster must be approximately 93 degrees F. in order to protect the brood there.

But there is a limit to the temperature which the bees on the surface of the cluster can endure. Accordingly, as the temperature drops, the cluster consumes food (if it is available) and generates enough heat to maintain cluster surface temperature of between 43-46 degrees F.

Beekeepers who subscribe to the theory that it is not low temperatures which destroy colonies and keep them from wintering successfully, forget the tremendous burden imposed on the members of the winter cluster in trying to maintain their cluster surface temperature during a period of severe weather that drops the thermometer to sub-zero figures, like our late January – early February.

This is one reason why those beekeepers who either maintain full depth and width entrance openings, or who set the upper of the two hive boxes back a distance of 3/8" or more have such heavy winter losses.

There is no necessity for such gross exposure. The elimination of moisture from the nest shell can be accomplished in any one of several ways without such extravagance exposure.

The honey bee winter cluster often faces circumstances which make it difficult, or even impossible, for it to move to food sources during extreme

cold periods. Under such circumstances the cluster members die. Many a beekeeper in the spring has found dead clusters of bees with more than adequate stores in the nest which the bees could not reach.

In many cases colonies will survive the winter adversaries but become so weakened as to contract EFB or one of the other brood diseases usually caused by stress. **We know honey bees are carries of at least six different potentially debilitating diseases which are exacerbated during extended periods of stress.** Such colonies seldom renew their strength fast enough to be able to produce a surplus even if they do, indeed, survive the debilitating effect of a brood disease.

Experienced beekeepers that operate in the North like we do have come to recognize the importance of a natural windbreak around an apiary. Winds that beat upon a hive over extended periods make the maintenance of normal cluster temperatures difficult, particularly after brood rearing begins on a fairly large scale in the late winter months.

The fact that a windbreak proves of value likewise demonstrates the value of packing against the ravages of low temperatures and winds.

The Upper Exit

There are many ways of providing escape holes above the cluster. One is to bore a hole in the upper front part of the second hive body. Personally, I prefer not to do so, though it is an easy procedure. Such holes can be stoppered in the following spring until needed for an extra entrance during the main honey flow.

A better way, I believe, is to notch a side of the inner cover. Or, better still, install an Imrie shim above the inner cover. Some have done something so simple as to place a sliver of wood 3/8" under one corner of the inner cover. This last method works well especially if one wraps his hives with 15# roofing paper, and cuts an escape hole in the wrapping paper over the corner hole, or space, under the inner cover and just above the top of the hive body rim. When cold weather arrives, the regular entrance on the bottom board may be entirely closed off when packing is provided and the upper exit is assured; for those that prefer, it may be restricted in size.

That an upper entrance for the escape of moisture is essential (other than merely into some top packing), is evidenced by the fact that the colony produces about one gallon of water for every 10 pounds of honey

consumed. No packing will absorb and hold six or more gallons of water over the winter period.

Upward Ventilation

In the many areas of the United States, wintering honey bees is a constant problem. In the attempt to successfully winter their bees, beekeepers have tried a variety of techniques from wrapping colonies in hay, straw, tar paper or foam insulation to wintering indoors in cellars or especially constructed buildings. For a long time collective wisdom deemed that it was of utmost importance to insulate the beehive against cold. This was probably influenced by those who thought bees were attempting to warm the interior of their hive as human beings did their houses. This is not the case. The bees only attempt to warm a discrete cluster of individuals within the hive.

Insulating practices often bring on other problems; especially vexing is that warm air trapped inside a colony by insulation is full of moisture. Experience and research now indicate that moisture-laden air is often more detrimental to honey bee colonies in winter than cold temperatures. In colder reaches of the colony, the moisture can condense and may even fall back onto the insulating layer of bees surrounding the cluster, producing an icy ball of bees. Therefore, conventional wisdom now dictates that insulation is not as important as venting excess moisture. Upward ventilation through use of an upper entrance was reviewed by Mr. G. W. Hayes, "Queen Excluder or Honey Excluder?," *American Bee Journal*, Vol. 125, August, 1985. Although the title suggests that queen excluder use is emphasized, Mr. Hayes also develops a case for upper entrances. He concludes with:

"We as beekeepers are constantly barraged with information about how beneficial ventilation and moisture removal is in over-wintered colonies. The upper entrance is always suggested as a method to accomplish this in winter and in very warm humid conditions during the summer. There have been many, many articles and whole sections of books written on the upper entrance theme...Perhaps we as beekeepers should be more flexible and look more closely at the upper entrance as a more efficient year-around option."

The need for adequate ventilation is also well documented during nectar flows. Some beekeepers routinely provide upper entrances for bees by propping up covers or even providing elevation blocks at four corners between supers. The practices

expose the surfaces of the combs to the large volume of air needed to reduce excess moisture in nectar. Care in ventilating hives is always tempered by the possibility of robbing; careful observation and judgment by the beekeeper must always be exercised to provide for maximum ventilation with minimum exposure to robbers. The stronger a colony of bees, the less possibility robbing will take place. The Southern Lower 48 states do not have severe winters when judged by the same standards as those in the Midwestern United States or Alaska, nor do they have the long, intense nectar flows often found in that region. But our State can be extremely humid during much of the year, and so maximum upward ventilation is also required to evaporate excess moisture during nectar flows. Large outbreaks of chalkbrood have been reported by beekeepers in the States. The disease is characterized by the brood turning into hard white chalky looking "mummies". It probably exists in most colonies on a year-around basis (is endemic) and, like nosema, becomes epidemic when conditions for its survival are optimum. There is no chemical control for chalkbrood. It appears that "good" management technique will reduce its incidence. Generally this calls for reduction of stress in a colony and the use of stock that might be resistant (that is adept at removing the chalkbrood mummies from cells to allow further brood production).

Chalkbrood is caused by a fungus (*Ascosphaera apis*) that appears to flourish in humid conditions. Does upward ventilation play a role in controlling the disease? Are your colonies ventilated properly to aid in reduction of chalkbrood buildup? Many may not be. In the spring of the year when chalkbrood is often problematic, there is quite a lot of stress on a colony. Cool morning moisture-laden air can easily "drain" into the bottom entrances of colonies. As the colony warms up during the day, upward convective ventilation in a properly ventilated colony should dissipate the moisture. The longer the moisture is trapped inside the colony, the greater the chances of it contributing to stress on a colony and to fungal (chalkbrood) development. Beekeepers whose colonies had an abundance of upward ventilation are reporting fewer chalkbrood problems. Perhaps the time has come for the Alaska beekeeper, like his/her Midwestern counterpart, to pay greater attention to the role of upward ventilation in a colony.

If using tar paper, use only 15#. Candy boards can be used on the top of the hive for winter feeding as well as moisture absorption. Tipping the hive slightly forward helps to direct excess moisture out of the hive. A reduced hive entrance is often employed to keep out pests like shrews and mice.

Blue Board insulation can be used as a “slip cover” if proper ventilation is provided. I have friends that have their thousands of hives in the fields for the winter and basically shovel snow over the hive and wait for spring to uncover them. One of the biggest of winter kill besides moisture, starvation, and wind is over inspection of the hive. Reports from Canada indicate that the hives thrive when left alone in the spring. One report stated that the inspected hives had approximately ½ the brood build up of the “forgotten” of “un-inspected” hives.

(David Hackenberg in Florida)

I recently spent two weeks looking at bee operations in Washington, Colorado, Wyoming, and Nebraska. CCD has been felt in some of these areas. Nosema seems to be creeping up on some folks in their bee yards. Treating with chemicals is an option. There is an organic product that costs about 1/10th of the price and has no toxicity. It is safe for human consumption. Have you treated this fall? Treating for mites is also required at this time of year if you have not already done so. Again there are many chemicals available. Powdered sugar does an effective job if you are going Organic. There is much information on the use of essential oils in the battle of honey bee pests. An easy way to treat with the essential oils is to take a roll of blue shop paper towels and cut them in half with your sawz-all. This gives you a roll about the size of toilet tissue. Put into a plastic container that has removable lid and pour the essential oil over the top. You can apply one sheet to the top of the hive and replace with a new one about a week later. Obviously daytime temperatures must be on the warm side for this to work. Hopefully your hives you are going to winter over have/are being fed thick sugar syrup. The bees need approximately 80#s of food stores to make it through our long winters.

After the trip to the states I went again to Washington to visit a large beekeeper in the Yakima Valley of Washington. I was amazed at the variety of honeys he produced. I brought back Carrot honey, Peach Honey, Squash Honey, among other rare honeys. I saw an ingenious design for catching Yellow Jackets. I lost about 4 hives this summer to Yellow Jackets and so was very interested in seeing this home made – ingenious design that worked extremely well. I also observed some creative ways to uncap, extract, separate, and filter honey that would work well for the small honey producers with more than 5 hives. There is a centrifuge now in the works for spinning the impurities out of the honey with no filters required. I am having one made for me out of stainless steel at this time. The honey can be spun filtered to your personal standards. You could end up with State Fair

quality clear honey, to honey with some of the propolis and pollen still in the honey. I prefer my honey to be filtered at 600 microns.

At this time of the year you should have your 35 to 100 pounds of honey per hive extracted and bottled. I have talked to many bee keepers this fall and the average honey yield seems to be very good from this nice summer we experienced. I had some Yellow Jacket problems but I believe I have the best trap for them now. I also saw very little problems with mean bees this year. I do not propagate mean bees. The State Fair was a success in honey sales. According to the print out I received from Jack, we had a record year in honey sales with approximately 75% of the retail price returned to the bee keeper after expenses. After talking to my bee suppliers I the states, our biggest concern on packages will be the freight. Crude oil is around \$86.00 per barrel which translates in increased fuel for our freight carriers. Wintering our bees is starting to make sense and \$cents! Storing your bees in a dark, cool (40 degrees F.), dry building or shed that has indirect ventilation does the best for me. I am wintering 35 hives outside as well with some new wintering techniques. Now is also a good time to evaluate your bee yard location. Met people that have lots or fields that would appreciate the bees and the good they would do for the area. I had a man approach me when I was flying back from Germany with the idea of putting my hives on his 29 acres of clover and fireweed in the Valley. He uses no chemicals on his acreage so this could be a good location to test 15 to 20 hives nest season. When you talk bees, folks are interested. The new cartoon movie about honey bees is a great place to start the conversation.