

GENERAL MAINTENANCE OF HONEY BEE HIVES

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Most experienced beekeepers and apiculturists agree there are two reasons honey bee colonies fail: (1) failure to monitor and treat for Varroa mites; and (2) failure to feed starving bees.

VARROA MITE MANAGEMENT

It is imperative to monitor for Varroa mites regularly. When mite numbers become too high, colonies die.

There are many resources available with information on how to monitor Varroa mites and interpret results. The Honey Bee Health Coalition is an excellent resource that provides videos, guides, and other tools to monitor and manage Varroa mites. More information can be found on their website at: <https://honeybeehealthcoalition.org/resources/varroa-management/>



Figure 1. Varroa mite (USDA)

FEEDING

Bees are generally fed in early spring before nectar sources are abundant, during times of drought or nectar dearth, and in preparation for winter if they do not have enough stored honey. However, depending on the area of Texas, some colonies may need to be fed nearly all year.

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Honey bees should be fed a sugar syrup ratio of 1:1 (sugar-to-water) by weight during spring, summer, and fall. During winter, the ratio should be 2:1 (sugar-to-water) by weight. The water will need to be heated to dissolve the sugar. Avoid boiling and be sure the syrup is completely cooled before introducing it to the bees.

There are many options for feeding. External feeders (Fig. 2) and entrance feeders (Fig. 3) are placed outside



Figure 2. External feeder



Figure 3. Entrance feeder—often considered a type of external feeder

the hive and may promote robbing (i.e., when stronger colonies steal food from weaker colonies) or attract pests. There is also no way of knowing how much food the beekeepers' bees have consumed.

Internal feeders come in a variety of different forms as well. Some popular versions are frame feeders and top feeders.

Frame feeders (Fig. 4) take the place of a frame inside the colony and contain up to 1 gallon of sugar water. Top feeders (Fig. 5) sit on top of the last super, and bees feed through a mesh screen between two wells, each containing a gallon of sugar water. Many variations of top feeders can be homemade (Fig. 6). Construction options include drilling holes in a plywood sheet and placing jars upside down for bees to feed from. Some beekeepers use an empty box and place chicken waterers with marbles in the well to prevent drowning.



Figure 4. Internal frame feeder



Figure 5. Internal top feeder



Figure 6. Homemade internal top feeder. Empty box with plywood bottom. Holes the size of jar tops drilled out of the bottom so jars can be placed upside down. Jar tops have numerous small holes so sugar water can be extracted by honey bees' lapping mouthparts.

Table 1. Pros and cons of external and internal feeders

External Feeders	Internal Frame Feeder	Internal Top Feeder
Easy to fill, do not have to suit up	Will likely have to suit up to refill	May have to suit up to refill
Do not know how much food the hives consume	Know exactly how much food is consumed in a certain timeframe	Know exactly how much food is consumed in a certain timeframe
Bees will not forage and feed when the weather is too cold	Closer to the brood, and easier for bees to find during cold months	May be far from the brood and queen, and bees may not find food quickly in cold weather

BEEKEEPING SEASONS

In addition to mite checks and feeding, a beekeeper will work with bees nearly all year. Here is a general idea of what to expect in beekeeping, by season:

Early Spring

This is a time of growth for the colony, and they will often need more food than they can forage. Thus, it is a critical time to feed bees. Although wildflowers may be blooming, there are probably more larvae in need of feeding than there is food available. Perform a mite check at this time and carry out the appropriate treatment, if needed. Healthy colonies may be split to grow the bee yard. Check the bees only every other week, as checking too often may induce stress on the hive.

Mid Spring–Early Summer

Growth of the colony continues during this time and the bees are usually bringing in enough food to support the colony. If the hive has been treated for mites, remove

pesticide strips according to the label directions. Bees may become crowded at this time, so add new boxes as needed. Honey supers and queen excluders are generally placed on hives in mid-spring. Checking hives every other week will prevent colonies from swarming.

Colonies that have failed to increase in population should be inspected to determine the reasons for their slow growth (i.e., failing queen, lack of resources, pest, or disease issue). During this time, beekeepers should be able to split colonies, as they are still on a population rise and have yet to hit their peak.

Summer

At this time, honey may be capped and can be harvested.

After harvesting, monitor for mites and perform appropriate treatment. During years of drought, feeding may be necessary. Provide water sources if there is no natural source and check every other week to ensure that the bees do not need more space.

Fall

As temperatures cool and rainfall is more frequent, beekeepers may experience a second nectar flow. Be cautious about taking honey from bees at this time because they need enough food to get through winter. This may be the last chance to re-queen for the year and it is recommended as a management practice to disrupt the Varroa mite lifecycle. Monitor for mites during this time to reduce their population going into winter.

Winter

Hives should not be opened on days cooler than 60°F, and brood frames should not be pulled or left out of the hive whatsoever. Queens may stop laying eggs, and foraging will slow significantly. Feed bees that do not have enough food stores and check hives for food reserves on warm days. A ratio of one frame of honey per two frames of brood is a conservative estimate for adequate food stores. Those with less than one frame of honey per frame of brood will likely need assistance during the winter.

For more information on seasonal “to-do’s,” visit Texas Honey Bee Education Association’s website: <https://thbea.com/wp-content/uploads/2019/04/THBEA-NewBee-Brochure-2018.pdf>

RE-QUEENING

It is a good practice to re-queen honey bee colonies every 1 to 2 years. Many beekeepers will requeen in the fall to stop the production of eggs for a short period of time and disrupt the Varroa mite life-cycle, reducing the population of mites going into winter months.

Some beekeepers prefer to re-queen quickly, and others prefer a slow release method. The method described here is a slow release, which can be modified based on time constraints and the situation.

Be sure to have a queen available and on hand, first. Remove the old queen from the colony and kill her by whichever means preferred. Many beekeepers prefer decapitation by pinching off the head because it is quick and reduces suffering. After removing the old queen, leave the colony queen-less for 1 to 3 days. At this time, the colony should be accepting of a new queen.

Carefully inspect the frames to ensure that the workers have not started to rear a new queen. Look for a queen cell with a larva and/or royal jelly. If one is found, destroy it immediately.

Depending on what type of cage the new queen arrives in, the following instructions may vary. Remove the cork plug or stopper on the candy end of the cage by pushing a small nail or twig into the candy to start a hole. Be very careful not to poke the queen. Then, place the queen cage in between two brood frames (use the wax to hold the cage in place). Beekeepers’ thoughts vary on the orientation of the cage, but remember: During hot months, placing the cage vertically, candy side up may cause the candy to melt and kill the queen. Vertically, candy side down may allow dead attendant workers to clog the exit so the queen cannot leave. To avoid both of these situations, place the cage horizontally with the screen facing down. Then smear a small amount of honey on the mesh side to both feed the queen and allow the workers to become acclimated with her.

Lastly, close up the hive for 5 to 7 days. After that time, check to ensure the queen has been released. If she has not, carefully open the cage and allow her to walk onto a frame.

Additional online resource available through AgriLife Learn, Beekeeping 101: <https://agrilifelearn.tamu.edu/s/product/beekeeping-101/01t4x000002ciQPAAY>