Apis m. Esoteria 6

To feed or not to feed?

SYRUP?

When: For population build up with few flowers; Dearth, no nectar; wax building; fall feeding.

With relatively fewer bees in the colony, feeding 1:1 syrup speeds up honey storage and wax comb pulling. The syrup feeder becomes a giant bee forager presenting the nectar at the entrance to the hive. The storage bee can take it right from the feeder bypassing the forager bee. When the forager bee arrives at the entrance, a storage bee will still take her nectar because the forager will make an anxious pushy movement if she isn't serviced quickly enough. The feeder does not make those demands on the storage bee so it can be ignored sometimes.

This extra source of nectar cuts down on the length and number of round trips, shortening the time necessary to bring the same volume of nectar into the hive.

During a dearth period when there is little or no nectar available in the flowers you must make the decision to feed or not. One important measurement is the amount of honey already stored in the hive. Another factor will be how long you think the dearth will last. Can the honey stores cover the estimated period? If you guess wrong, you can always start feeding. You must also consider the time of the year. Is there enough time to refill the food stores if you don't start feeding early enough?

If you want the bees to draw large amounts of comb, providing readily available syrup reduces the length of time each round trip requires of a foraging bee. This trick can be used early in the season to make comb before the nectar flow begins. Use a thin 1:1 syrup to stimulate honey wax production. You will not be wasting honey to make the wax comb.

After nectar flow, you may want to feed 2:1 syrup to get the hives as full of stored honey as possible before winter sets in. Really, you must get the stores up before the flowers stop blooming. During a long dry fall the bees can eat much of the

winter stores. I think sugar syrup honey is healthier for the bees if it is mixed with the nectar honey and pollen the bees collect in the fall. To stimulate honey storage, use thicker 2:1 syrup. That is 2 sugars to one water. It can be in pounds or gallons. Exactness is not important because all flowers don't have the exact same sugar content. I like to add aroma (Honey-B-Healthy), vitamins, minerals, and amino acids to my syrup making it more closely simulate nectar. This mix would be more healthful and appealing to the bees. I also add ¼ cup liquid bleach per 5 gal. of syrup as a preservative and algae fighter. The bees love it, as bleach is just another salt. Are they not attracted to chlorinated swimming pools?

I start my spring feeding early in the fall. The bees will not convert syrup to honey when ambient temperatures are below 50^{o}F or during extreme cold periods when the cluster is still formed. To beat the cold spells associated with early spring I make sure the hive bodies are packed full of stored honey in the fall, before Thanksgiving.

Whenever you see bees flying in the fall after all the blooms are gone or in the early spring before blooms arrive, they come home empty and eat honey. They may consume more than they can convert from syrup. By feeding constantly in the fall you keep the hive brim full of honey. Then when the cold part of winter does come, the bees will have the maximum amount of food available right in front of the cluster.

Why use a field feeder instead of an in-hive feeder?

There is an old idea that bees can get lazy with an in-hive feeder and not forage. I don't know! Young bees are not good at foraging for several days. They learn to forage following older foragers. If the young bees grow into foragers in the fall and early spring without having to leave the hive for nectar they may not learn how to forage as they transition from nurse bees to foragers. The field feeder will act as a giant flower, and the bees will forage to it. Since the bees go to the most "lucrative" source, when the field feeder becomes empty, they will look for another source. The drawback to a field feeder is you will be feeding all the wild bees and your neighbor's bees also.

In hive feeders are effective to just feed the colonies individually. You can get imaginative with “in hive” feeding set ups. The Bordman feeder at the entrance is the most obvious feeder. You can monitor the amount of syrup just by walking by and looking. You don't have to open the hive to refill it. The Bordman feeder may stimulate robbing from stronger hives as the leakage from the feeder attracts other bees.

You can cut properly sized holes in your telescoping covers to place feeder jars into. When you don't have the feeder jars you need to place a jar lid without holes in it to keep the rain out.

You can use baggy feeders inside the hive under the inner cover. You might want to make a 1 ½” spacer to fit above the top bars. Fill a gallon zip lock baggy ¾ full of syrup. Zip it shut. Place the baggy like a pillow on the top bars of the upper frames. Carefully slice (with a very sharp knife) 5 slits like the 5 on a dice, one inch long. The bees will come up and sit on the baggy to eat.

You can put an empty hive body above the brood chamber and set upside down quart or half-gallon jars full of syrup right on the top bars. Make very small holes in the lid so the bees can lick the syrup. Too large of holes will drip on the bees and honey below. This is not good.

There are in hive tray feeders and frame feeders that can be made or purchased. Feeding above the colony may have the advantage of creating a more normal location for the bees to look for food. Excess honey is stored above the bees.

In hive feeders can become breeding areas for hive beetles. Field feeders might also, but the damage the hive beetle larvae can cause will not be inside your hive.

DO NOT overfeed. If the foragers are bringing nectar into the hive faster than the queen is laying eggs, the storage bees will back fill empty cells in the center of the brood area. This discourages the queen from laying eggs. The queen can get confused and think the hive is full of food and brood because she cannot find a place to lay eggs. She will then decide to swarm. A fall swarm cannot establish a viable hive before cold weather. An early spring swarm can deplete a very small colony of bees. I have seen this happen with a package that is over fed.

Feed lightly to mitigate daily dips in nectar flow. By this I mean let the feeder be empty between refills. This keeps the bees in the natural foraging mode. But they get a little food to slow down the net consumption of their honey. They will maximize the storage areas around the brood area.

The bees will eat the unripened honey before they eat the stored honey. The honeybee adds water to the dehydrated capped over honey before it is consumed. It is easier to consume the higher moisture content unripened honey which is in open (uncapped) cells. Bees don't "eat" honey. With capped honey at 18% moisture bees would shrivel up like raisins. They rehydrate the honey with water before using it for food.

To prevent overfeeding: if it takes 3 days (or five) to empty the feeder, wait 3 days (or 5) before refilling the feeder. This allows the honey placed in the brood area to be used for brood food. The queen will then have empty cells to lay eggs in and will keep laying. Unripened honey is used for brood food first. It is easier to feed unripened honey than it is to rehydrate honey and use it for food

In the fall after brooding stops, it is okay for the colony to back fill the brood area with honey. This places the honey at the center of the cluster later in the winter. You can see this process starts in late fall when there are still some nectar sources and the queen begins to slow down on egg laying.

Sugar Syrup Recipe

2:1 Sixteen pounds (four 4 lbs. bags of cane sugar to per one gallon (lbs. ea. Gal.) of water. It helps dissolve the sugar if the water is very hot. Water heated to over 170^{o}F will create inverted sugar. This breaks the bond in the complex sucrose sugar making it glucose and fructose, which is what the bees eat.

1:1 Half the sugar or twice the water

I like to add a vitamin/mineral substitute (honeybee healthy, vitamins, and amino acids) to my sugar syrup. It balances the diet, making it more healthful like real

nectar. It also has a floral aroma to attract the bees. See supply houses for pre-mixed additives.

If you store lots of 2:1 syrup over the winter, you can dilute it with 1 gallon of water per 1 gallon of syrup to make 1:1 syrup in the spring.

A little bleach added to the syrup will extend the shelf life. A little bleach (1/8 cup per gal will not hurt the bees. They are attracted to swimming pool water, are they not?

Sucrose vs. High fructose

Nectar is mostly glucose and fructose with very little sucrose sometimes. The enzymes that the bees add to the nectar to make it honey breaks all the sugar into glucose and fructose. Cane sugar (sucrose) is two glucose molecules and fructose molecules hooked together. It is easy for the bees to make into honey. High fructose corn syrup is a manufacturing by product of corn gluten processing. It used to be a "waste by product". It is very hard for the bees to process. Commercial beekeepers use it because it is cheap and convenient. It might be better for the bees not to use it. However, it only stresses the bees not, kill them.

When feeding bees, watch for robbing. Due to laziness and not ranging far afield, scout bees will look to a weak neighboring hive for an easy meal. Especially if using entrance feeders. An in-hive feeder or a field feeder will help prevent robbing.

Don't mix syrup with nectar flow when you are collecting honey. The bees will mix the sugar syrup and the nectar messing up your honey. If you have weak hives that must be fed, use an in-hive feeder. You might have splits or packages growing during nectar flow and there are not enough bees to forage and pull wax, so you feed just to help them out. If there is a dearth in the middle of honey collection, remove the honey supers and then feed the bees. Replace the honey supers when the nectar flow resumes

Cold weather feeding Management

Spring Fall Winter

Bees don't go to the feeder as aggressively in cold weather. They won't travel the distance to the feeder, even if it is an in-hive or at the front entrance. An in-hive feeder above the top bars is a more natural feeding position for the wintering colony. The cluster tends to move up as it feeds throughout the winter. A "baggie" feeder on the top bars is the most natural simulation. A "tray" feeder above the brood box is a little farther away measuring the inches the cooled down bees need to travel. Also, the open pool of syrup in a tray feeder could introduce a lot of moisture inside the hive. The baggie feeder has less exposed surface for evaporation.

A disadvantage to an in-hive "frame" feeder is that it is placed to the side of the cluster. Sometimes it is the last frame space next to the hive box. This forces the bees to move sideways in the winter. While the bees do move sideways to feed in hot weather or even on a warm winter day it is not the optimal placement for accessing stored food. Bees have been known to starve to death with honey 2-3 inches away and to the outside of the cluster.

Syrup vs. dry feed in winter

Possibly too much moisture is introduced into the hive during cool periods with syrup feed. Beekeepers switch to 2:1 syrup as winter feed because the higher carbohydrate concentration can be converted to stored honey easier than 1:1 with less dehydration. High Fructose Corn syrup is even thicker than 2:1.

Sometimes, you open the cover of a hive (summer or winter) and you see droplets of water on the top bars. This is called "rain". It is caused by condensation under the cover. The moisture forms on the warm side (inside) of the cover at night. Doesn't the moisture form on the outside (warm side) of the iced tea glass? The purpose of the hive's "inner" cover is to separate the cool surface (inside) of the telescopic outer cover. The moisture will then drop onto the upper side of the inner cover versus raining directly on the top bars and the bees. The bees will go up through the vent hole in the inner cover if they need

moisture. In a properly located hive the sun will dry this moisture up by noon, reducing the chances of moisture-related diseases.

Feed sugar patties or fondant (thick cake frosting) as good substitutes for syrup especially when trying to feed them in cold weather. The bees do not have to process so much water out of the syrup. Dry sugar or candy can also be used but the bees need water to dissolve the solid sugar before making it food. Patties and fondant both have a little moisture in them. Fondant is also a good emergency food when bees are completely out of food and starving. You can place the fondant right among the hungry bees. Sometimes starving bees have too little energy to move. They just sit and shiver.

Fondant Recipe

Make a paste out of powdered sugar and corn syrup. If you are a purest and don't like putting commercial 10x powdered sugar in your hives because of the corn starch, find or make powdered sugar. Put regular sugar in the blender or coffee grinder and powder away. If you don't like corn syrup, just make a little hot water and use it to make a paste out of the powdered sugar. If your fondant isn't thick enough, after it is cool add a little Crisco. Bees eat Crisco just fine. Place fondant in the freezer or refrigerator just to make it thicker and easier to handle. You can also buy ready-made fondant from your bee catalogue or a restaurant supply cooking place.

CAUTION! Prevent Drowning

No matter what kind of feeder you use look at it from the perspective of the bees drowning. You want to reduce the drowning risk. Some feeders are better than others. Most feeders will have a few non-swimmers that drown. Most types of feeders that rely on floats for the bees to walk on will have the highest losses. Feeders where the bees can not actually get in the syrup are best. These will have some type of barrier or screen that limits the bee to only sticking their proboscis

in the syrup. The bees need traction when they are crowding around the edge of the feeder which makes screens better than plastic walls. Every bee you drown is one less forager.

A consideration with feeders is how often they require filling and how easy are they to fill. Larger feeders take longer to empty, but algae and crud will build up in them. Hive beetles also will have more time for their eggs to mature and larvae to live. Smaller feeders take more work and monitoring. Commercial bee operations use gas tank sized refueling trucks and hoses and nozzles to refill their 10,000 hives. You can cut that down to a plastic tank and electric pump (weed sprayer) outfit with a shut off nozzle. Or just mix 1-2 gal of syrup at a time in the kitchen.

Situations when supplemental feeding might be necessary occur whenever there is not a current nectar flow. Keeping an eye to the end of winter when it is the hardest to keep bees fed and they are the least likely to go to a feeder, you want as much honey in the hive at this time as possible. So, you don't want them to eat their winter store early to cover the abnormal dips in the nectar flows. Feed your bees for the spring, in the fall. Have the hive full enough to make it all winter without early springtime feeding. Here in the mountains, we say it takes 90 pounds of honey to make it from Thanksgiving until the middle of March.

During dearth periods and periods of cold/warm temperature swings in the spring the bees build up population but there is not enough nectar available to keep the hive expanding. This can also occur after a frost when the current flower blooms are frosted, and the next ones haven't bloomed yet.

During long 3–4-week rainy periods (think hurricane) and high winds that knock nectar out of the blossoms there is no nectar in the blossoms. Summer hailstorms don't help much either.

During hot dry spells (dearth) lasting more than one week. There will be no nectar in the blossoms. These late summer occurrences come when the colony population is at its peak after the main nectar flow. The bees can consume the entire winter honey storage in 4 weeks. Since the brood chamber is still large the

winter stores are not completed. Hence, the stores are eaten fast. This can also happen around goldenrod blooming time creating a situation where the bees did not complete their winter food collection. The colony will go into winter short of food. It takes about 90 lbs. of honey to feed a single hive body for 90 days (in NE GA.). When does the 90-day period start? Only the bees know. When does it end? You must keep checking the weight of your hives in the late winter and spring to ensure there is enough food. Use the "tilt test" to check weight. Lift the corner of the hive regularly all summer long. You will notice the hive getting heavier. Lifting it in the winter you will feel it getting lighter. When you lift it and it tips over it is empty!

When nectar flows stop the queen stops laying eggs. The foragers will die naturally because they are half expended when the dearth started. With no follow-on eggs hatching, when the dearth breaks there will be a reduced population in the hive making it difficult for the colony to recover the volume of food which was consumed during the dearth period. The colony will most likely suffer at the end of winter. Syrup feeding will keep the queen laying eggs.

Feeding Pollen

New evidence indicates that the everyday honeybee needs lots of pollen to stay a fat healthy bee. We cannot see this without dissecting the bee and looking at the inside of the abdomen with a microscope.

There is a system of little white fat globules connected by a duct. The honeybee has a straight through gut tract. No stomach, heart, intestines, etc. These "fat bodies" act as the bee's liver filtering sublethal doses of pesticides, herbicides, and other pollutants. They also are a fat reservoir that the bee will tap during seasonal dearth periods and the long winter. If there is not enough fat stored in the bee's abdomen to make it through the shortage of food, they will starve to death. As the fat bodies are depleted the bee can become more susceptible to diseases.

The fat stored in the "fat bodies" comes from consuming pollen.

Eating pollen during brood season provides high energy levels for the adult bees who are feeding the larvae. This allows the nurse bees to secrete more enzymes to mix with the bee bread for food and make honey for storage.

Nothing is better than fresh wild pollen and nectar, but sometimes we need to help.