

Honey Granulation

1-5-2012

Honey is a super saturated water solution containing the disaccharide sugars fructose and glucose. This means that it has far more solids than water and it is inherently unstable in liquid form. The sugar solids account for 82%, leaving the water content at only 18%. Over a period of time all honey will granulate but the beekeeper can help to delay granulation by several methods. There is a wide variation in speed of granulation of honey depending on the floral source. Canola honey may granulate one day after collection and must be extracted immediately. Clover honey is less likely to granulate as fast. The most important attention needs to be given to ambient temperature while extracting and storing if good quality honey is to be produced.

Raw honey is defined as honey that has been processed with as little heat as possible. For example, substituting a non-heated fork to uncap the ripened honey, instead of the practice of using a heated knife will maintain the best flavor and volatile components of raw honey. It is normal to warm the extracted honey to allow wax and other particles to rise to the surface for skimming before packaging or filtering honey. Heating to below 120 degrees is considered still in the raw honey range. Raw honey tends to granulate on it's own in a short period of time. Standard practice for store bought honey is to heat the honey much higher for two purposes. Heating to 160 degrees will change the nature of the sugars and will delay granulation for several months. Of course this process removes some of the natural, delicious flavor expected in raw honey.

Granulation is also accelerated by the presence of other solid particles such as the suspended pollen particles normally part of raw honey. much of the honey sold by commercial packers remove the pollen by a "micro filtration process" in order to extend shelf life. Chinese honey is "micro filtered" to conceal the true origin of poor quality product. In the US, natural, unprocessed honey as sold by a small beekeeper always contains suspended pollen and many folks claim that this local pollen helps to relieve hay fever symptoms. In Europe there is a new regulation that requires labeling of honey that contains pollen The other reason for heating honey to 160 is to destroy any yeast spores that may cause fermentation in the honey. Overheating to 167degrees will darken the honey and will seriously damage the flavor.

When honey granulates it is the glucose fraction that crystallizes rather than the fructose that stays in liquid form. The glucose solids are glucose oxalate and during formation will release water to the honey as they form. Any increase in water content above 18% will allow yeast to grow resulting in fermentation or spoilage of honey. During storage of honey keep it in a closed container at room temperature. Do not keep honey in the refrigerator. It is necessary however, to keep maple syrup in the refrigerator because it only has about 65% sugar which is not high enough to prevent fermentation. For long-term storage, honey may be kept at any temperature below 60 degrees. Honey keeps liquid and granulation free in a freezer or even on the front porch for sale at zero degrees. Of course honey that has started to granulate can be easily reliquified by heating in a warm pan with water at 110 to 120 degrees. Leave it there for a few hours, as the time is more important than a high temperature. In summer honey jars can be reliquified by laying them (tightly closed) on the dashboard. in bright sun. Be careful that they don't leak!

The next meeting of the Catskill Mtn beekeepers club will be held on Tuesday, January 10 at 7:00 PM at the Agroforestry Resource Center on Rt 23 in Acra. Anyone wanting to start the exciting and rewarding hobby of beekeeping needs to sign up soon for the beginners course being held on Saturday January 21, (snow date Jan 22. Classes fill up quickly –call for reservations at 518-622-9820

New Parasite Threatens Honeybees

1-12-2012

It is not unusual for an amateur biologist or even a biology professor to feed a captive praying mantis. This is one of the most valuable beneficial insects as it preys on harmful garden bugs. Biology professor John Hafernik at the San Francisco State Univ found some dead honeybees lying beneath some lights, probably attracted to the light at night. Forgetting that some dead bees were still in the vial on his desk, the next time he looked at them he was amazed to find that the bee bodies were surrounded by a bunch of tiny fly pupae. Apparently a parasitic fly had laid eggs on the live bees and fly larva had hatched out. The fly was identified as a "Phorid fly" *Apocephalus borealis*, a native of Asia known previously to parasitize our local bumblebees and paper wasps.

Surveys in the Bay Area revealed that this fly was found in 77% of the hives sampled as well as in the state's important agricultural Central Valley and in South Dakota. Bees killed by this fly were also found to be infected by *Nosema cerana* and viruses often connected to bee kills attributed to Colony Collapse Disorder. Honeybee biologists are surprised that these "bee killers" have not previously been found and identified as honeybees are among the best-studied insects of the world for the last decade. Investigators suggest that this fly invasion may have only started its spread in the US. Previous research has found that mites, a virus, a fungus, or a combination of all of these factors may be responsible for the widespread colony collapse.

Further observations show that the fly lays eggs in the bee's abdomen. After several days, the parasitized bee bumbles out of the hives, often at night on a solo mission to nowhere. These bees often fly toward light and wind up confused and unable to find the way back home. When the larva hatch, as many as 13 crawl out from the bee's neck. This behavior seems similar to that of ants parasitized and decapitated by fly larva from another *Apocephalus* genus.

The research team plans to track bees with radio tags and video cameras to see whether infected bees are leaving the hive willingly or getting kicked out in the middle of the night and where the flies are finding the bees for laying eggs. Most of the parasitized bees found so far have been foraging worker bees rather than younger "house bees". Any significant loss of foragers still would cause decline and probable colony collapse. The simple, accidental way that this discovery was made will enable any professional or amateur beekeepers to contribute to continued research on the spread of this parasite.

Beekeepers can collect samples of bees that leave the hive at night by means of setting up a "light trap". The sample bees are then kept in a closed vial and observed for emerging fly larva. Pinpointing the location and extent and range of this strange bee behavior could also be a key to stemming colony collapse disorder.

The next meeting of the Catskill Mtn Beekeepers Club will be held on Tuesday, Jan 10th at 7:00 PM at the Agroforestry Resource Center on Rt 23 in Acra. The beginning beekeepers course scheduled for January 21st requires reservations by calling 518-622-9820. Students need to hurry to sign up as the class fills up quickly.

Baking Holiday Treats With Honey

1-15-2012

In many cultures sweet baked treats have been an important part of traditional holiday celebrations. For thousands of years, delicious, nutritious honey has been used to sweeten these treats. Here are some baking ideas on substituting honey for sugar in your baking. Honey is truly a gift of nature. It is the golden harvest of nature -- produced entirely from the sweet, fragrant juices of summer blossoms. Honey is a natural sugar and an excellent energy source. It adds flavor and prolongs freshness in all baked goods.

Honey has the ability to absorb and retain moisture, a property that retards drying out and staleness of your baked goods. Cakes and cookies made with honey develop a moist texture and stay fresh longer than if they were made only with sugar. In the busy holiday season, baking can be done ahead of time.

When using honey in cake baking, it is best to use recipes that have been tested with honey. Otherwise, the general rule is to reduce the liquid 1/4 cup for each cup of honey used to replace sugar. In any recipe, liquid means water, milk, eggs, or juice. Substituting honey for the full amount of sugar may produce a heavy texture in some baked goods. In recipes calling for large amounts of sugar, such as cakes or cookies, substituting honey for half of the sugar called for and reducing the liquid will produce a lighter product. In a cake recipe calling for one cup of sugar, use one half cup of sugar and one half cup of honey and reduce the liquid by three tablespoons. In some recipes the total amount of sugar can be reduced when substituting honey as it is sweeter than sugar. For example, in a cookie recipe calling for one cup of granulated sugar, 3/4 cup of honey can be substituted for one cup of sugar without reducing the sweetness.

In bread making, honey can be substituted for all the sugar called for, as most bread recipes do not call for large amounts of sugar. For leavening, best results are obtained by using directions on the baking powder can. A small amount of baking soda is needed to neutralize the acidity of honey. When honey is substituted for sugar in baked goods, add 1 1/4 teaspoon of baking soda for every cup of honey used. If the recipe uses sour milk, or baking soda, it is not necessary to add any extra baking soda. Breads, cakes and cookies made with honey may brown more rapidly than baked goods made only with sugar so it is well to reduce baking temperature about 25 degrees to prevent "over browning."

For easier pouring and less waste, use a greased cup when measuring honey. Measure the fat or oil first, then the honey in the same cup. Vegetable oil, melted butter or egg will serve the same purpose. When using a spoon to measure honey, dip the spoon in oil first and the honey will pour off to the last drop.

When adding honey to creamed shortening or beaten eggs, add the honey slowly in a fine stream. A cup of honey weighs 12 ounces; therefore, a one-pound jar actually is a little over 1 1/4 cups of honey. When using a recipe that calls for eggs, add honey gradually to the eggs while gently beating, to prevent curdling. Use cooking oil on the threads of the honey jar for easy lid removal. Although most pure honey (and especially raw honey) will eventually crystallize, it is not spoiled. Gentle heating in a hot water bath easily liquefies solid honey. Never heat honey over direct heat to avoid scorching the delicate, delicious treat.

The next meeting of the Catskill Mtn Beekeeping Club will be held on Tuesday February 14th at 7:00 PM at the Agroforestry Resource Center on Rt 23 in Acra.

Modern Beekeeping

1-26-2012

Modern commercial beekeeping has changed from primarily honey production to crop pollination. With this change has come extraordinary stress as colonies are moved multiple times a year, increasing their exposure to disease, parasites, and other hive pests. Antibiotics and acaricides are being applied more frequently, resulting in resistance and comb contamination. The future use of bee colonies as mobile pollinator populations requires modern management methods with fresh perspectives on nutrition, breeding practices, and the role of microbes in sustaining colony health.

Honeybee colonies are in greater demand and are renting for higher fees than ever before. Crops such as almonds and apples are completely dependent on honeybees for proper pollination. Finding ways to prevent outbreaks of disease and to control parasites is essential for reducing colony losses. Commercial beekeepers can only arrange to send bees to pollinate selected large farms with many acres of crops, however the majority of fresh fruits and vegetables that we need are grown on small farms all across the country. Millions of small beekeepers and hobbyists are widely distributed but do provide the essential pollination for the smaller farms. There is a shortage of these beekeepers especially in our "North Country" where harsh winter weather makes it more difficult for colonies to survive. Unfortunately, keeping bees alive isn't that easy but with proper training and mentoring it becomes one of the most relaxing, fascinating and rewarding hobbies.

Last November the Honeybee Corner announced a \$59,000 USDA grant awarded to the Empire State Honey Producers Assoc. Matched with funds from the ESHPA this program is targeted to help NY beekeepers to stop the loss of honeybee colonies in the State. The problems of loss of honeybees have been in the spotlight recently but this has caused renewed interest and has increased enrollment of newbees for the beekeeping classes. This ESHPA program will not only provide help to recruit new beekeepers but also to encourage retention of them through technical assistance. Special encouragement will be extended to small-scale beekeepers who keep bees in our area year round.

The next meeting of the Catskill Mtn Beekeepers Club will be held at 7:00 PM on Tuesday Feb 14th (bring your valentines) at the Agroforestry Resource Center on Rt 23 in Acra.

Pollination or Honey Production?

2-23-2012

All beekeepers must make a choice between raising bees for honey production or for pollination service. The hobbyist often keeps his bees in his backyard (or nearby) for convenience or because he wants to actively practice hive management. The hobbyist seldom moves the bees for pollination and chooses to manage the hives for honey production. Large, commercial beekeepers, which want to raise bees for honey, usually need more forage area and therefore need to move their bees to furnish nectar where the season and climate provides. For example the big Northeast outfits move their hives to the Southeast states in the winter where there is some nectar bloom year round. They are able to make splits and bring the hives home strong and healthy to produce honey for the spring and summer at home.

The beekeepers that choose to trade honey production for pollination must “chase the bloom” wherever a commercial crop is to be found. Although honey production is limited, whenever the bees are flying, an adequate amount of forage pasture must be provided between pollination contracts. Northeast pollinators start with the fruit bloom in NY, like cherries and apples, then move on to cranberries in NJ and MA, and later go to the blueberries in Maine. Pollination fees have increased so that those “migratory” beekeepers earn more money renting their bees to pollinate as they do producing and selling honey. This trend has cut into the total US production honey and with growing demand for honey it means more honey must be imported.

Fees for pollinating almonds have increased to the level that invites migratory beeks to haul bees a thousand miles to find a profitable crop. Just now the almond orchards in the Central Valley of northern CA are finishing up the blooming of those late flowering varieties and reports show there is no real shortage of bees for pollination anywhere in the country. An observer has reported on details for the enormous effort of almond pollination. Looking down the lane in one of the huge orchards he saw 12 huge flatbed trucks lined up and ready to be unloaded by boom and Bobcat in those designated spots as the grower directs. Each truck was piled high with 480 white boxes per load. This shipment would be enough to pollinate 370,000 trees over a 3000-acre portion of the orchard. By petal drop time, sometime in March, the bees must all be removed, as the grower must spray to protect his crop from destruction by common pests.

The bees cannot stay in the orchards or even nearby and will have to move on because without almond bloom, the region turns back to a desert. The almond is native to the warm Mediterranean climate but March in northern CA is too cold for native plants to bloom. The “sanctuaries” for these bees to feed have traditionally been found back home where they started. The upper Midwest (Dakotas) is where many migratory beeks are located. These open prairies have furnished happy grazing for bees of large migratory beekeepers often using designated Conservation Reserve areas. During the past few years, farmers who have converted large acreage to the growing of a corn crop have gobbled much of this land up. The price of corn has doubled this year and now migratory beekeepers must find alternate areas for maintaining their colonies. Another problem is that since heavy pesticides are used on corn crops, bee colonies must be kept several miles away from cornfields.

The next meeting of the Catskill Mtn Beekeepers Club will be held at 7:00 PM on Tuesday March 13th at the Agroforestry Resource Center on Rt 23 in Acra.

Risks of Almond Pollination

3-2012

Just now as you read this, a beautiful white carpet of 750,000 acres of almond tree blossoms cover the landscape between Bakersfield and Sacramento in Northern California. Migratory beekeepers are delivering 1,500,000 hives after hauling them for hundreds of miles. (Total hives in the US estimated at 2,600,000). Both the growers and the beekeepers hope for a good pollination but there are many risks that need to be considered. The beekeepers spend months trying to build population in the hives in spite of the winter season when most bees would rather be half asleep in a cozy, tight cluster. It will take a great deal of pollen substitute and sugar syrup to stimulate the 6 to 8 frames of bees as contracted with the growers to be delivered at just the right time when the blossoms are opening up. Some beekeepers time their journey to arrive at the orchards at exactly the blossom time. This is risky as snow may delay travel between Minnesota or South Dakota and California or the state inspectors may delay acceptance or even reject the entire load in case a few fire ants or other pests are found.

Other migratory beekeepers choose to haul their bees to California early but they have the added cost and labor of finding holding yards where they unload and must continue to feed and build population to meet the almond pollinating standards. The growers want the bees to be delivered just as 10% of the blossoms are opening, but of course, no one can predict exactly when that is! Growers will check the number of frames covered by bees to ensure that the hives will be effective. Cold wet weather can delay blossom time and extended light rain may wash out nectar and prevent bees from flying. (Central Valley predicts rain this week). Bees cannot be delivered too soon for a good pollination. If they arrive before that particular variety is in full bloom, the bees do what they always do- go out and find whatever other flowers happen to be blooming and they will then stay away from the almonds. For proper crosspollination, two different varieties of almonds must bloom at the same time and each be visited by the bees.

Growers mark the location of hives to be placed where they will do the most good. The standard for a good crop is to install at least two strong hives of bees per acre. Most growers buy crop insurance but the terms require a minimum of two hives per acre. Its up to the beekeeper to distribute the hives throughout the orchard. This is usually done after dark, to prevent loss of flying bees. The heavy flat bed trucks do not navigate the muddy orchard lanes and if a truck gets stuck the hives need to be offloaded and located by hand truck. If the weather and bloom is good, the beekeeper may return home with well-populated hives and boxes with honey. With so many hives crowded together in the orchards, every bee disease and bee pest is likely to be also brought home. The almond orchards are spreading over a large area in California. In 1982 there were only 339,000 acres compared to 750,000 today. There are 124 almond trees/acre and each acre produces a ton of nuts. This means that 750,000 tons of almonds may be produced this season. When newly planted orchards start to bear there will be 850,000 acres all needing bees for pollination. The demand for pollination hives at that time will strain the supply of hives available.

The next meeting of the Catskill Mtn Beekeepers Club will be held on Tuesday, Feb 14th at 7:00 PM at the Agroforestry Resource Center on Rt 23 in Acra. The program will be led by Laurie Herboldsheimer, a noted author and owner of the Golden Rule Honey Co in Massachusetts. Any one interested in beekeeping is invited to attend.

How to Buy Honey

3-15-2012

In recent years there has been a change in how the majority of “store honey” is produced and marketed. According to a report from the Food Safety News, over $\frac{3}{4}$ of the honey sold in US grocery stores isn't exactly as the bees produce but has been processed by ultrafiltration. The Codex Commission's Standard for honey establishes principals for the international trade in food and has ruled that “no pollen or constituent particular to honey may be removed”. Stores selling honey that has been ultrafiltered include: A&P, Safeway, Stop & Shop, and honey brands Sue Bee, Busy Bee and Wegman. During the ultrafiltration process the unique flavor, and the pollen, a natural component of real honey is removed. The pollen in natural honey provides the nutritional components such as vitamins, minerals, amino acids, antioxidants, enzymes, and other biologicals that we are accustomed to enjoy.

The process of honey ultrafiltration includes heating to enable the honey to be forced through extremely small filter medium under high pressure. Sometimes it needs to be watered down. Since pollen particles provide the only foolproof identifying sign of the geographic source of the honey, its absence removes its true identity. Honey exported from China is ultrafiltered to hide the true origin of the product. Honey exported from China and some other countries has been found to be contaminated with heavy metals, illegal antibiotics, and even corn syrup. The FDA is not able to inspect all honey from these countries but Commerce Dept has been able to identify some honey shipments transshipped through a third country to avoid high tariffs. Some illegal shippers have been identified and prosecuted and heavily fined.

In order to find good “old fashioned”, real natural honey (not ultrafiltered) it is necessary to find honey in a specialty store that is labeled as “Raw Honey” or better yet to buy from a local beekeeper who always provides raw, flavorful, unheated honey. Another source of raw honey is a local farm produce stand or a nearby farmers market. If you really want to buy the best honey, you need to be selective in where you buy it and always read the label!

The next meeting of the Catskill Mtn Beekeepers Club will be held on April 12th at 7:00PM at the Agroforestry Resource Center on rt 23 in Acra. Any one interested in honeybees is invited to the meeting.

More Trouble in the Orange Groves

5-4-2012

In August 2009 the Honeybee Corner reported a serious bacterial disease threatening the orange groves in Florida. Recently the "Citrus greening", also called HLB, has been found in California and as a result, seven counties in Southern California have been declared in quarantine.

It is now illegal to move fruit or citrus plant material out of these counties and the quarantine includes commercial citrus groves as well as citrus trees owned by homeowners on private property. These drastic steps are ordered by the California Dept of Food and Agriculture (CDFA) in a desperate attempt to keep the spread from reaching the valuable "Citrus Belt" in the San Joaquin Valley in northern Cal. For further information on the Asian citrus psyllid and HLB visit www.cdfa.ca.gov/plant/acp/.

We may find a scarcity of our breakfast orange juice in the next few years as a result of a bacterial disease called "Citrus Greening" or Huanglongbing (HLB), first detected in Florida in 2005. There is no known cure for this deadly disease that affects all types of citrus trees. The only type of control to prevent wiping out the entire citrus crop is to remove and burn infected trees and then plant new, healthy trees. The Honeybee Corner column in 9-4-08 first reported its threat to our citrus crops in Florida and California and since that time there has been "significant decrease in citrus production" according to the Florida Citrus Mutual. The winter harvest 2008/2009 was 159 million boxes, down from 170 million last season. HLB has been found now in all 32 of the Florida citrus-growing counties. 530,000 acres of farmland in Florida are used for citrus production. Total citrus business in Florida is \$9 billion compared to \$1.2 billion in California. A tiny insect called the citrus psyllid, which is the size of an aphid, spreads this bacterial disease. Attempts to control the spread of HLB in India and China with parasitic wasps and pesticides have not been successful. About one half of the OJ sold in the US is imported from Brazil but this country, as well as citrus groves in Africa, Asia and the Philippines are also infected with HLB.

There will be a significant effect on the honeybee industry if there is a reduction of citrus production in the US. Typically the nations northern migratory beekeepers extract (harvest) honey from the hives in the fall and send a small nucleus of bees with a queen to warmer climates such as Florida and Southern California. The hives build up on the bountiful nectar from the citrus groves all winter at a time when no flowers are available "up north". In a good year they can make 3-4 "splits" from each hive sent down in the fall and in this way can increase their inventory of fresh, young colonies preparing for the spring season of migratory pollination. In the absence of adequate winter citrus blossoms, the northern beekeepers will need to find other sources of nectar to sustain the hives. It will be difficult to locate other crops or "wild forage" with the quantity and quality of the nectar from the orange groves. This will probably increase costs of bees and of pollination services next year.

The next meeting of the Catskill Mtn Beekeepers Club will be held on Tuesday, May 8 at 7 p.m. at the Agroforestry Resource Center on Route 23 in Acra. Anyone interested in honeybees or beekeeping is invited to attend.