

## **Honeybees—An Ancient Biological Weapon**

by Dick Johnson 12.24.09

Old time legends tell of various means to use honeybees and “mad honey” to support both defense and offense during wartime. Throughout history, there are tales of the use of honeybee hives to defend property from marauders. The use of beehives within a tunnel were a means of defensive “booby traps” to chase away the enemy. While attacking fortified castles, warriors used catapults. Huge stones and firebrands were “lobbed” over the walls like mortar rounds, to damage the defenders within. Live honeybee colonies were also used by attackers to be thrown over the walls and to create confusion and injury to the castle defenders.

The taste, nutritional, and various therapeutic qualities of honey are widely variable depending on growing conditions and geographic location of the nectar plant. Certain domestic plants have been known to produce “toxic honey” under some growing conditions. If these plants are the only nectar source and if large amounts of honey are consumed, it may cause illness symptoms. Plants such as rhododendron and mountain laurel may produce these symptoms. It is fortunate that these native plants seldom are available in sufficient quantity to affect our local honey. In Europe there are some common plants that are able to produce large quantities of toxic honey that is known to produce various effects. This is called “mad honey” and is used by some as an aphrodisiac. Depending on dosage, this same honey may cause dizziness, nausea, and syncope. Mad honey or “Deli Bali” is produced each spring in the Trabzon region of northeastern Turkey close to the Black Sea. The amount of a dose is no more than 5ml, spread on toast and this can produce debilitating mental and physical symptoms after 12 hours. Honey intoxication among tourists to this region is common, as few believe that such a small amount can cause symptoms. The locals temper the toxic effects by eating local yogurt and local strong bread.

Ancient biological warfare was recorded by a tactic used by the Turkish army defending Trabzon against invading Romans. The defenders left out their toxic honey to be robbed and eaten by the invaders and when the enemy got sick it was easy counter attack and to conquer them. The Greeks also learned about this trick and used it against invading Macedonians.

Those amazing honeybees can serve society in many strange ways!

## **Baking Holiday Treats With Honey**

by Dick Johnson 12.17.09

In many cultures sweet baked treats have been an important part of traditional holiday celebrations. For thousands of years, delicious, nutritious honey was the only sweetener as cane sugar was not available. History tells us of the popularity of managed honeybees in ancient Greek and Roman cultures. Honey was used in all of the original recipes for the German stollen, Italian panettone, Portuguese Roz Dove and the many Hanukkah sweet treats. Honey is nutritious as well as tasty as it adds vitamins, minerals, and flavinoids not provided with sugar. Recent research in New Zealand demonstrates that substitution of honey for sugar leads to weight loss and also reduced triglycerides in blood levels.

Here are a few tips for using honey in your cooking and baking. In recipes calling for large amounts of sugar, such as cookies or cakes, substituting honey for half of the sugar called for and reducing the liquid will produce a lighter product. For bread making, honey can be used for all the sugar as most bread recipes do not need large amounts of sweetener. Since honey is slightly acidic and also the action of yeast fermentation produces CO<sub>2</sub>, (acidic and "illegal"), a small amount of baking soda is suggested to adjust the pH close to neutral, the optimum level for the yeast fermentation leavening action. Add 1-1/2 teaspoons of baking soda for each cup of honey used and this will allow for normal "raising" of the dough.

For easier pouring and measuring of honey it helps to warm the honey and to use a greased measuring cup to pour from. If the recipe calls for cooking oil then use the oil cup first before measuring honey. Coating the threads of the honey jar with oil will make removal of the lid easier. A cup of honey weighs 12 ounces (avoir); therefore a one pound (avoir) honey jar actually contains a little over 1-1/4 cups (fluid meas). Be careful measuring and follow the recipes written for honey cooking. Baked goods using a lot of honey may brown more rapidly so consider reducing the baking temperature 25 degrees. Using honey in baking will result in a light, moist texture capable of staying fresh longer than those goods made with only sugar.

Happy holiday and happy baking with delicious honey!

## **Microbes and Honeybee Nutrition**

by Dick Johnson

12-10-09

Microbes including bacteria and fungi perform an essential function in the processing of food for the honeybee colony. At the same time they aid digestion and contribute towards reducing the growth of pathogens. Honey is produced by bees by simply concentrating the dilute sugar solution that they collect from blossoms. Bees add an enzyme to convert compound sugars (sucrose) into the simple sugars including glucose and fructose for ease of digestion.

Bees gather pollen from the same blossoms and this valuable resource provides essential minerals as well as protein for the growth of the young bees (brood). The microscopic grains of pollen are designed to preserve their live protein contents within a protective sheath of “armor” until the seed fertilizes the next blossom visited. This sheath is so tough that it resists dehydration, acid and alkaline attack and is often found intact after thousands of years! Honeybees have developed a unique process to unlock the important nutrition from the pollen grain by using a complex biochemical processing.

Using several microbes to their advantage, bees inoculate the raw pollen grains with their lactic acid producing bacteria from the common “Lactobacillus” family. Lactobacillus varieties are widely used in the dairy industry for processing cheese as well as yogurt type foods. Yogurt producers brag about the use of *L.bulgaricus*, *S.thermophilus* and *S.bifidobacterium* among their other secret bacterial recipes. These microbes are carried in the bees’ digestive system. The lactic acid lowers the pH, making the pollen more acid and providing a suitable environment for the multitude of fungi, yeasts, bacteria, molds and other microbes to take over. It is this fermentation process that actually breaks down the protective armor of the pollen grain and releases the nutritious protein contents. The resulting product that is packed away in cells of the honeycomb is known as “beebread” and is used by the bees and is fed to the young bee brood. The low pH created by the microbes also acts to prevent growth of many pathogens that otherwise might contaminate the beebread.

Much of the pollen is collected in the fall and is stored as converted beebread over the winter to be ready to feed to the hatching brood early in spring, even before new pollen is available from early spring blossoms. It is essential that the stored beebread be wholesome and in good supply for the early spring population build-up of the colony.

Recently a problem of bee nutrition involving beebread has been identified and is currently under investigation. Fungicides applied to food crops while bees are pollinating do not seem to seriously affect the health of honeybees at that time. It has been found however that residues of some fungicides contaminate collected pollen and interrupt the normal fermentation process of conversion of pollen to beebread. Noticing that this beebread is not properly converted, the bees sometimes seal it with a black capping to prevent it from being fed. This contaminated and sealed beebread is called “entombed pollen” and appears to be the result of the delayed effect of fungicides.

## **Ancient Visions of Beekeeping**

by Dick Johnson

12-03-09

Ancestors from early civilization have been keeping “managed” honeybee hives and enjoying the hive products for at least 2000 BC. The mysteries of the bee biology were poorly understood then and are actually still being unraveled at this time. It was in the 16th century when Charles Butler in England sorted out certain basic information such as the role of the queen and drones and how the young bees were produced and wax and honey production.

Aristotle recorded a great deal of natural history, as it was known at the time. His series of 10 books entitled “History of Animals” described many animals, parts of animals and generative systems from his own observations and studies. Although hardly “modern science”, in his fifth book, chapter XV111 he makes a number of remarkable observations about bees. This is the book that beekeepers of the mid-ages used as their authority on bees and beekeeping. Some of the theories from his book provide interesting conclusions.

Aristotle wrote that those large bees in the hive were the “rulers” and the queen was designated as the “king”. The rulers produced the worker bees that originated in the upper part of the comb and unless the ruler was present, drones only would be made. The rulers were produced in the lower part of the comb (queen cells). The king bee never leaves the hive unless with a swarm. There are two kinds of kings, one is red and the other is black. The red ones are better (?). The drones build their own cells and they make no honey but make a lot of noise flying outside the hive. It is good for the hive to have only a low number of drones as the workers are more industrious. When wind is strong workers carry a stone with them for a balance (keep in mind that a sailboat needs this type of balance in a storm). The progeny is deposited in the cells, incubated like bird eggs, then a small white worm appears and is fed. Wax is made from flowers as the bees climb on the plants. They gather wax and carry it to the hive in pockets on the back legs. (Actually that is pollen on the legs). Pollen and propolis is carried on the back legs too. Propolis called “mitys” is gathered from “glutinous trees” and is smeared on the hive surfaces and built up to protect the open entrance. Bees do not make honey! They collect that which falls from the air when the stars are right and when rainbows touch the earth.. Then in a couple of days they find the cells filled with honey. Honey is made in two seasons- spring and autumn. Spring honey is lighter and better. (Greece is hot and dry in mid summer drought-just like here)

Much of the rest of the book describes an amazing understanding of bee activities including swarming, workers cleaning cells, foraging for water in hot weather, disease like foul brood, behavior during foul weather and bee predators.

## **Beekeeping and Black Bear Risk**

by Dick Johnson

11-12-09

Now that the “frost is on the pumpkin” and everywhere else too, we wonder where the honeybees will go when the weather becomes bitter cold. There are many types of bees and different kinds of bees survive winter in different ways. Those “good bees”, the honeybees, don’t go anywhere as they already live in their hives for winter quarters. All of the other kind of bees, including those ”mean bees”, don’t make it through the winter and only their queen survives for next spring. Their queens must find a good hiding place to be able to stay alive during the bitter cold winter.

Honeybees begin to prepare for winter in September by raising a good bunch of new, healthy young bees called “winter bees”. These are able to store extra fat compared to “summer bees” and this capability enables them to better live through the winter. As soon as the hard frost arrives the bees form a tight cluster, hopefully in the lower part of the hive. Within the cluster, bees vibrate their muscles to generate enough heat to keep the cluster at a survival temperature of 40-50 deg. Bees constantly move into the cluster center to keep warm and move to the outside to be able to feed on the stored honey. Bees eat to keep up their metabolism all winter long. Bumblebees are similar to honeybees in that they are considered to be “social insects” like honeybees. This is defined as the ability to use the entire family to care for the raising of the young from the hatched egg to the emerging adult insect. The bumblebees also collect pollen and nectar and convert it to honey and store a limited amount to feed their family during the warm weather. All worker and drone bumblebees die as soon as the temperature drops below freezing. The queen must find some sort of shelter. Perhaps she goes underground or hides within a rotting stump. The dangerous, aggressive, whiteface hornets are the ones that build those big gray paper nests that hang on a tree limb. During winter these fragile paper structures shatter and provide no protection for the hibernating queen who must seek other shelter. The wasps make either small mud or paper nests that give their queen no winter hideout either.

Only the honeybees have the capability to “plan ahead” and to store away surplus pollen and capped honey for their winter survival supplies. We can learn a lot from those resourceful honeybees!

The next meeting of the Catskill Mtn Beekeepers Club will be held on Tuesday, November 10th at 7:00 PM at the Agroforestry Resource Center on Rt 23 in Acra. The program will be presented by Paul Kappy the chief Bee Inspector from the NY Dept of Agriculture

## **What Happens to Bees in the Winter?**

by Dick Johnson

10-29-09

Now that the “frost is on the pumpkin” and everywhere else too, we wonder where the honeybees will go when the weather becomes bitter cold. There are many types of bees and different kinds of bees survive winter in different ways. Those “good bees”, the honeybees, don’t go anywhere as they already live in their hives for winter quarters. All of the other kind of bees, including those ”mean bees”, don’t make it through the winter and only their queen survives for next spring. Their queens must find a good hiding place to be able to stay alive during the bitter cold winter.

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## **The 2009 Honey Season**

by Dick Johnson

10-22-09

Beekeeping this summer has been more difficult than any other I can remember. The late, cold spring and the “monsoons” that appeared most of June and July prevented the bees from flying and even washed out the available nectar from blossoms like on the black locust trees. Normally a heavy, productive nectar flow during spring and early summer provides the pollen and nectar surplus so important to feed the thousands of baby bees, or brood. Without these new bees hatched out early summer, there are insufficient new bees to gather supplies for late summer and fall. The result was no light colored (clover) honey this season and a very poor (dark) fall crop. The bees never had enough time with good, sunny weather to put away surplus honey reserves. Many beekeepers did not take off any honey at all, preferring to leave it for the bees to use to get through the winter. Due to the shortage of honey locally and throughout the country the prices for honey will be rising. Many other countries have suffered drought conditions causing shortages on the world market also.

Now that the temperatures have dropped below freezing, we notice that many hives still do not have enough honey to make it through the winter. The asters, goldenrod, and bamboo have no nectar now and so, if we want to assure winter survival it is essential to feed sugar to our colonies. In warmer weather we can feed liquid sugar syrup. But the removal of water from syrup during this unusually cold fall (global cooling), takes more energy by the bees. Therefore it is suggested that dry sugar or sugar “candy” be fed directly on the top frames. Candy is made from sugar heated together with some corn syrup making a fudge-like texture. This is better for the bees as it provides water as well as carbohydrate nutrition.

It is way past the time to install mouse guards, however if this essential component has not yet been furnished, it would be best to take all the boxes apart to look for mice nests. It's not too late to clean out any nests and to put the guards on now. The cluster with the bees gathered around the queen should be in the bottom box and above that there should be a box full of honey and pollen. During winter the bees will eat their way upward and when the spring inspection is done the bees will be eating the last of the honey stored in the upper box. This is the time to remove any empty or partially filled boxes. The bees should not be made to heat empty space during the cold weather. If there are some frames full of honey, move them to the lower boxes or store them for early spring feeding.

The good news is that the health of bees in the entire country is better than in some past years. Locally there are no reports of the notorious CCD and nationwide there is very little trouble with this disorder. Good evidence that our local bees are healthy is that there were record- breaking swarms reported and the feral population appears to be thriving. Perhaps better management and natural selection has begun to help the health of our bees.

## **Honey Granulation**

by Dick Johnson

10-15-09

Honey is a super saturated 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 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 its 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. The other reason for heating honey to 160 is to destroy any yeast spores that may cause fermentation in the honey. Overheating to 167 degrees 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!

## **Nanobees and Cancer**

by Dick Johnson

10-8-09

The Wall St Journal on 9-28-09 reported some breaking news about research “Targeting Cancer with Bee Venom”. Researchers at Washington Univ in St Louis have found a way to deliver “Melittin”, a component of bee venom, to seek out and destroy cancer cells in tumors. The technique uses “nanobees”, which are tiny inert particles imbedded with the melittin compound, suspended in a solution for injection into the blood stream. ( Nano sized particle research is also used in “cutting edge” microelectronics). The particles are so small that about 180 nanobees would fit on a 1micron sphere. Each nano’ is 0.1524um (microns) or .000006 inch. Preliminary results indicate success in halting growth and shrinking tumors in mice with breast and skin cancers. It is well known that melittin has the property of destroying living cells, however when coating the particles with a lipid layer, it was found that the nanobees selectively attacked only cancer cells. Much more research and human clinical trials need to be done but this is a good and promising start.

The father of apitherapy research in the US was the late Charles Mraz of Middlebury, VT. Recognized internationally for his queen breeding, beekeeping management and inventions, he knew and shared his knowledge with the famous Brother Adam of Buckfast Abby in Britain. Charlie taught and promoted the use of honeybee venom for treatment of symptoms of arthritis, MS, and many other diseases. For over 60 years patients from the world over came to him for help with treatments for conditions that doctors were unable to satisfy.

Charlie developed the technique to collect honeybee venom from his hives and to package it for supplying to pharmaceutical labs. This is the serum currently used by allergy Drs for sensitivity testing. About 60 years ago he found anecdotal evidence of tumor reduction through use of bee venom. During one of many visits with Dr Chester Stock at the Sloan-Kettering Institute in Pt Chester, NY he obtained test mice implanted with “sarcoma 180 tumors”. He experimented with treating the mice with various therapeutic products from the beehive including pollen, royal jelly and venom. He was able to use honeybee venom to shrink and completely remove the tumors in all the mice treated. He then revisited the SKI Institute to show the amazing results of his success. The researchers there admired his work and said ”very interesting” but never did follow up on Charlie’s work. Obviously he was disappointed but this is the same casual treatment that he received when demonstrating his successful treatments to any medical researchers in the fields of arthritis and MS. Charlie would have been glad to know that finally someone is recognizing the benefit of honeybee venom in cancer treatment.

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

## Nature Study In Our Local Forest Preserve

by Dick Johnson

10-1-09

Once again the Catskill Mtn Beekeepers Club has been privileged to provide a part of the annual "Environmental Awareness Days" program. This year marked a special recognition for the sponsoring Cornell Cooperative Extension and also for the efforts of Eric Rassmussen who has developed and supported this program for 40 years. On Tuesday September 22, during the lunch period, local and state officials presented Eric with a certificate of merit for his commitment to youth education about our natural resources. This year was also a special occasion for the beekeeping demonstration part of the program. Our club marked the 13th year of continuous participation with several club members present to help the 6th grade students to learn about the importance of honeybees in our environment and how they live in the hive and observation hive.

On Tuesday September 22, at 9:00 AM several busses arrived full of enthusiastic 6th grade students from Cossackie- Athens and Hunter-Tannersville. They toured in class groups through the 8 different "stations" where they learned first hand about forestry, animals, watersheds and pond life. We've been told that the next day essays, written by students, often name the bee exhibit as their favorite one of the day. Bee club members conducting the demonstrations included Mary Pesez Kames, Barbara Koerner-Fox, Lynn Kramer, and Maria Kolodziej.

The second day of the program, Wednesday Sept 23rd, started off with threatening weather but fortunately there was no rain. Students from Windham-Ashland-Jewett and other schools were in attendance for this day and the bee program was conducted by Heidi Ruehlmann and Helen Faraday Young. After the short break for lunch, when they returned to the exhibit area, they found that a bunch of bees from a nearby bee tree had "taken over" the super box and frames with honey. The air was filled with bees circling the frames! The students were moved to another part of the exhibit area and the 15-minute session was continued safely without other interruption. We had an unexpected opportunity to show how honeybees will seek out any fresh honey opened nearby their home. The speed with which the scout bees found the exposed honey in the equipment suggests that the feral honeybee colony makes its home in a tree nearby in the 150-acre Siuslaw forest tree farm. Before the cold weather sets in, the bee club plans to "bee line" trace to find the location of this nest so that we can monitor it. It took several minutes to smoke and brush off the clinging bees so that all of the equipment could be packed up and prepared to be taken home.

The next meeting of the Catskill Mtn Beekeepers Club will be held on Tuesday Oct 13th at 7:00 PM at the Agroforestry Resource Center in Acra on Rt 23. The program has been changed. It will be presented by Chris Harp on the topic of "preparing the hives for winter".

## **Why Blame Honey For Botulism?**

by Dick Johnson

9.24.09

For thousands of years mothers fed pure, nutritious honey to all babies to help their digestion and to calm them down. About 30 years ago, based on circumstantial evidence, our “political correct” authorities decided that a few infant deaths were caused by botulism and that the spores “must have come” only from honey. This was a ridiculous conclusion, as it is well known that the spores of *Clostridium botulinum* are found everywhere. Just like hundreds of other types of bacterial spores, both infectious and beneficial, most spores float in the air and are found on all surfaces. The real problem is that IF an infant less than two month old happens to ingest a large quantity of botulism spores from any source, their immature intestinal flora has not become resistant to the spores and they may suffer from botulism. To be redundant, the American Association of Pediatrics and the Center for Disease Control has determined that no infant under one year should be fed honey. Large honey packers are required to print a warning on all honey containers. This gives the appearance to consumers that honey itself is “bad for babies” and this is simply not true. Since the botulism spores are ubiquitous, it is far more likely that a contaminated pacifier dropped on the floor or a dirty food dish would cause any large quantity of spores. Furthermore, the vegetative form of botulism is the only form that produces the toxic effects and these bugs cannot survive in honey due to honey’s antimicrobial properties that prevent growth of bacteria, mold, or fungus. Ripened raw honey is the only natural, unprocessed food that for all intents and purposes will never spoil when stored properly in an airtight, moisture proof container. The mechanism of this property is explained by certain physical as well as chemical properties. The high sugar content and high pH (acidity) allows it to dehydrate any living bacteria. Raw honey also contains an enzyme, glucose oxidase, which produces the antiseptic properties of hydrogen peroxide. For example, an active vegetative culture of *C botulinum* grown in a petri dish (in vitro) will be killed by the addition of a drop of fresh raw honey. Since these spores are prevalent throughout our environment and are present in many other foods besides honey, the question is: why do we focus only on feeding healthful, honey to infants under one year old? The process used by the bees to produce ripened honey from pure nectar inside the hive prevents any accumulation of vegetative or spores. If any high spore count was found in any honey product it would have to be the result of contamination during extracting or bottling. Beekeepers have always been aware of the need to maintain the highest standards of sanitation while processing honey, as the unique purity of this natural product is essential for its acceptance by the consumer. The next meeting of the Catskill Mtn Beekeeping Club will be held on Tuesday Oct 13th at 7:00 PM at the Agroforestry Resource Center on Rt 23 in Acra. The program will be presented by our club president, Rich Ronconi, who will discuss his international beekeeping visits to Chili, Portugal and especially his recent trip studying “Africanized bees” in Puerto Rico.

## **Undertaker Bees**

by Dick Johnson

9.17.09

Honeybees live in extremely crowded conditions. Whether they are feral (wild) bees in a hollow tree or are managed in a couple of wooden boxes, they are likely to have a population of 50,000 bees in the warm weather season. Maintenance of strict sanitation is important to prevent disease from spreading through the colony. Propolis is a resinous, gummy material produced by bees and gathered from tree bark and plant buds. Bees “varnish” the interior walls of their cavity with propolis that has antibiotic and antiviral properties. Bees also strive to maintain a healthy hive environment to protect their brood and stores of honey and pollen. They practice a strict behavior to remove any debris or dead bees or brood to prevent disease pathogens from spreading through the colony. To accomplish this task there are certain bees that specialize in removing trash (garbage collectors) and also dead bodies (undertakers).

A young honeybee goes through several work assignment stages depending on their age. Upon hatching they start to clean out used cells for the queen to use to lay eggs. Later they spend 24/7 feeding the young larva and then their wax glands begin to produce tiny flakes of bees wax. They chew the wax flakes and fashion them into the delicate and precise pattern of hexagonal cells to form the important comb structure. Next the young bees groom and feed the queen, licking her to collect and spread through the hive the important queen pheromone that is essential to keep the entire colony together. Finally after about 3 weeks of in-hive work they try out their wings and prepare to forage for nectar and pollen. Foraging bees live only for 4-5 weeks when their wings wear out and they usually die out in the field.

A small group of older bees perform the specialized tasks of guarding the entrance and also are the undertakers. Research has identified chemicals that make up the “stench of death” found in dead bees and those materials assist the undertaker bees to locate and to promptly remove the bodies. Volatile fatty acids such as oleic acid and other related compounds make up the stench helping the undertakers to find and dispose the potential diseased bodies from the hive. Actually the undertakers move the bodies only to the entrance opening of the hive. It is other bees that fly away with the corpses and take them up to 50 yards away from the hive location. Four simple fatty acids like oleic acid compose the combination “code” smell that the guard bees use as recognition odors at entrances as they examine each visiting bee. Scientists found that when animals die, their corpses exude a particular stench of death that repels their living relatives. This specific blend of fatty acids produces a smell that helps living animals avoid others that have succumbed to disease or places where predators lurk. This same research may hold the answer to one of the mysteries of the so-called Colony Collapse Disorder where one of the baffling symptoms has been the reluctance of robbing bees or wax moths or the small hive beetle pest to enter a CCD hive after the worker bees have all disappeared. The new theory is that after the adult bees start to leave the hive, and there are insufficient bees to care for the brood, the brood will die and the fatty acids stench scares off the workers and robbers from returning. Bees that “disappear” are merely escaping from a potentially diseased hive. This describes a natural impulse of the absconding bees for self-preservation.

## **Don't Blame The Goldenrod**

by Dick Johnson

9.10.09

Goldenrod is one of our most common yellow plants and is widespread among open fields as it blooms late August and September. Goldenrod is often unfairly blamed for causing symptoms of hay fever. Hay fever is caused instead by wind-blown pollen called "anemophile pollen". The goldenrod pollen is heavy, sticky and never airborne and must be moved about by insects. This is the kind of pollen, called "entomophile pollen" and is collected by honeybees and other insect vectors. The pollen that causes hay fever symptoms is the lightweight, wind-blown pollen from ragweed that also blooms now. Other wind-blown pollen causing distress includes oak tree pollen and all types of grasses that flower in the spring.

It is thought that honeybee pollen, even in small amounts, acts as a gentle allergen and stimulates the person's own immune system to produce antibodies. These antibodies then act in a way to counteract the effects of the wind-blown pollen-the real culprits causing suffering. Some folks take raw, unfiltered honey for relief from upper respiratory symptoms and hay fever. This honey contains suspended particles of bee pollen that provide the relief. Some beekeepers sell pollen that has been collected from their own beehives. Pharmacies and health food stores also sell pollen capsules as a natural food supplement.

For centuries, goldenrod has been considered an important herbal plant, The Latin name "Solidago" – solido that means to make whole-is an illusion to the use of the herb as a wound healing remedy in the ancient world. Goldenrod possesses diuretic, anti-oxidant, and astringent properties. It has been widely used for treatment of kidney and urinary tract disorders. It also contains saponins found to be effective in treating many kinds of yeast and fungus infections including Candida. An herbal tea made from goldenrod has also been used for treatment of upper respiratory symptoms contrary to the erroneous myth.

At the end of the honey season goldenrod provides an ample supply of aromatic honey. The beekeeper can actually smell the powerful fragrance unique to goldenrod nectar being ripened. The pollen brought in by foraging bees carries a bright yellow color that stains the wooden frames and the cells where it is stored for the winter. Goldenrod honey granulates easily and prompt extraction will prevent solidifying within the comb. A light amber color is often darkened by natural blending with other nectar gathered from fall flowers such as aster and bamboo. Many beekeepers harvest all of the honey by mid-August and plan to leave all of the balance (mostly goldenrod) for the bees to provide winter stores. This is not a good practice as goldenrod honey contains certain indigestible sugars and dextrans that are not assimilated. During winter when the bees are not able to get rid of the indigestible materials, this may lead to dysentery (nosema). It is a better practice to remove and store the ripened goldenrod honey supers and feed them back to the hives in the spring when the bees can fly and get rid of the indigestibles.

The Catskill Mtn Beekeepers Club is pleased to announce that during last months meeting we counted 100 members in our club. We have shown steady growth of our club since it was started in 1996. The club meets on the second Tuesday of each month at 7:00 PM at the Agroforestry Resource Center on Rt 23 in Acra.

## **Bee Stings At Picnic Time**

by Dick Johnson

8.28.09

September is traditional picnic time. Among the uninvited picnic guests it's likely to see some yellow jackets. Unlike gentle honeybees that are vegetarians, the aggressive yellow jackets are carnivores and feed on other insects. This is why they show up just at the time that the delicious aroma of hot dogs and hamburgers floats in the breeze from the broiler. They also have a "sweet tooth" and go after the sugar in your ice tea or soda pop. Remind the kids to check for bees especially if the drink has been left on the table for a while. There are two types of yellow jackets that build their populations late summer and early fall. The native, most common type makes its nest in the ground and is actually smaller than a honeybee. The other type is one inch, double the size of the honeybee and is native to Europe. Both of these pests are shiny, bright yellow with black stripes- different from honeybees that are tan and black and "fuzzy". The other serious pest at the picnic may be the white-faced hornet. This is a large, shiny black bee with white markings on the head. These are the bees that build those big round gray nests hanging from a branch. Both of these bees are aggressive and can sting multiple times, unlike the honeybee. It is unlikely that honeybees create a problem unless the picnic is in a beekeepers yard. Honeybees don't want to sting as they lose their life but they will use their stinger to protect their hive. Unless you threaten them, while honeybees are foraging in the flower garden, they usually are very gentle. Despite the hysteria associated with honeybee stings, they do not cause a medical crisis for 99% of our population. The honeybee has a barbed stinger that continues to inject venom under your skin for a couple of minutes. The best advice is to get the stinger out as fast as possible to prevent injection of the "full dose". Fortunately, many persons develop a tolerance to stings, and their reaction is much reduced after frequent, repeated stings. Most persons do not experience any symptoms other than a burning sensation for two minutes, a red spot, and localized swelling. Occasionally a mild allergic reaction may cause itching, a rash, or light-headed feeling and these symptoms usually respond to antihistamine pills. The dangerous type or reaction is a drop in blood pressure and any difficulty breathing. This may be an anaphylactic reaction and requires immediate medical attention. Persons hypersensitive to bee venom should carry the pocket bee sting kit available by prescription. Treatments to desensitize highly sensitive persons are available from specialized allergists to greatly reduce bee stings. When a person accidentally receives multiple stings there will be significant swelling but a healthy adult usually recovers fully after 300 to 500 stings. There has been considerable concern about the spread of the "Africanized" honeybees now found in most of the deep southern states. These bees are very aggressive but beekeepers in those areas have adjusted their management to be able to maximize their pollination of crops and honey production. These aggressive bees will not breed locally as they originated in the tropics and cannot survive our cold temperatures.

Don't expect any problems from gentle honeybees but be careful with the "picnic bees".

## **Trouble In The Orange Groves**

by Dick Johnson

8.26.09

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.

## **Milkweed Bee Traps**

by Dick Johnson

8.06.09

Wandering through the field early one rare sunny morning, I was aware of the heavy perfume coming from a large patch of milkweed in full bloom. The tennis-ball-sized clusters of pink blossoms are composed of small five pointed stars exuding the heady fragrance. Honeybees, hummingbirds, butterflies and an assortment of hundreds of other insects share in the ample feast of nectar and pollen from this common plant. Following the bloom the plant forms large 4inch pods that contain feathery seeds blown by the wind in the fall. During WW11 these fluffy silken seeds were used in life jackets and a fluffy pillow can be made by collecting enough feathery seeds. The immature pods (less than one inch) are edible by cooking with a few changes of boiling water. Flower buds are also edible. The stems and leaves contain a sticky milky sap that is toxic and should not be eaten raw. The beautiful orange and black monarch butterfly depends on milkweed for its survival and their huge black and yellow caterpillars feed mostly on this plant. The monarch is not eaten by most birds as is bad tasting and birds avoid it. It is thought that the toxic milky sap gives the bad taste to the butterfly. A similar orange butterfly called the "viceroy" looks like the monarch and enjoys the same predator protection. Monarchs do not like cold weather and like our local "snowbird" residents, they fly thousands of miles south to Mexico only to return again in the spring. Honeybees are attracted by the fragrance and the sweet nectar reward but they do not purposely collect milkweed pollen. So attractive is the nectar that a field of milkweed is actually humming with the sound of honeybees enjoying nectar harvest. The milkweed flowers have a unique design that is called the "pinch trap" mechanism. Certain clumps of very sticky pollen are supported on strap-like stalks that can actually adhere to the legs and mouthparts of a bee or other insects that come to collect nectar. It takes considerable effort for the visitor to pull loose from this flower trap and some small flies and even bees are occasionally killed by being stuck in the trap. When the bee does pull loose, the sticky pollen as well as a part of the pollen strap adheres to all of the bee legs making it difficult for her to continue to forage. These pollen clumps and multiple straps can be observed hanging on bees while pollinating milkweed. Bees pollinate milkweed at their own risk.

## **Come To The Fair— Visit The Honeybees**

by Dick Johnson

7.23.09

The famous Greene County Youth Fair opens TODAY! This unique youth fair was started 55 years ago and was first celebrated in Windham. It is held now at the Angelo Canna Park Town Park in Cairo where you can see our talented youth's agricultural accomplishments. You can bring the whole family to see all of the entertaining activities, as parking and admission are FREE. Wander through the many educational displays and enjoy the music and great food. There will be a BBQ and fireworks on Saturday PM. For more info call 239-6159 or [www.greenecountyyouthfair.com](http://www.greenecountyyouthfair.com).

Stop in at the Catskill Mtn Beekeepers tent next to the pavilion. Watch the live honeybee exhibit, and learn how honeybees make delicious honey for us to enjoy. Ask why honeybees are "GOOD BEES" and why we should love the honeybees. Of course you may take home some of the local, unprocessed, raw honey and other products of the hive.

Honey will be a little scarce this season for two reasons. As Bob Beyfuss has recently noted, this is "The summer that wasn't" He is reminding us of the unseasonable cold and wet weather that we have seen for several weeks. Yes, this has had an effect on the honeybees as it has delayed their efforts for foraging and also has delayed their ability to dry out and ripen the honey crop. The health of the local honeybees is good but the honey crop will not be ready 'till next week. Also since the Youth Fair is one week early this year, most beekeepers have not yet been able to harvest the honey crop.

The next meeting of the Catskill Mtn Beekeepers Club will be held on Tuesday Aug 11 at 7:00 PM at the Agroforestry Resource Center on Rt 23 in Acra. The guest speaker will be the recognized lecturer and author, Ross Conrad from VT

## **Those Amazing Honeybees**

by Dick Johnson

7.16.09

As the beekeeper watches a busy hive entrance on a warm July day it seems that the bees are leisurely going about their business flying out to forage and returning with their loads of goodies for the colony. Little do we realize how industrious these little ladies really are. Some statistics recently published describe just how hard they work and accomplish both inside and outside the hive. Previously we described the importance of water gathered by foragers to help in feeding the larva as well as to air condition the hive in warm weather. We now learn that the bees gather 5-6 liters of fresh water for each hive during the mid summer. That's a lot of work when you realize each bee can only gather and deliver one small drop at a time. Whenever a foraging worker returns with a load of supplies it is met by a "house bee" which receives the load of water, nectar or pollen by mouth-to-mouth transfer called trophallaxis. The house bee then delivers the supplies properly in the hive. Propolis foragers that collect that sticky gummy resin enter the hive and need help from other bees to pull off this sticky stuff.

Bees are very capable fliers as they can fly to and fro and even hover like a helicopter. Strong muscles in their thorax enable them to attain 400 to 500 beats /second. If you listen to the happy hive, a low humming can be detected. This sound is the bees singing and is a normal content sound. A foraging bee sounds louder and if you threaten their hive, you can hear a much higher pitched sound as the guard bee is zigzagging in front of your face. This is like the sound of a rattlesnake giving a warning. Bees have been clocked at 30km/ hour even with a full load. Nectar from blossoms furnishes the carbohydrate for the larva and pollen collected fills the need for protein and minerals. The report tells us that it requires 30/40 kg of pollen per hive to rear the brood each season.

The young are raised in a deep box called the brood chamber. Worker bees build cells from beeswax for the queen to lay up to 2000 eggs per day in the deep frames. Wax is manufactured by young bees and produced from several glands on their abdomen. Tiny particles or specs measuring 0.2 mm are chewed by bees and fashioned into the precision hexagonal cells that make up the comb for raising the young bees. The raw material to make the wax includes 8 pounds of honey and pollen to make one pound of wax. A deep frame about 8 by 16 inches contains 80,000 wax cells per side and to build them it requires 80,000 hours and 991,000 specs of wax. The typical brood box uses 10 frames and it's easy to see how a healthy hive in summer can have a population of 50-60,000 bees. On top of the deep brood box (or boxes) the smaller "super boxes" are placed to gather the surplus honey produced in a good year. These smaller boxes contain only about 3000 cells per side and when full of ripened surplus honey yield about 8 pounds of the golden treat per frame. Now you know why they are called "busy bees".

## **Honeybees Need Water**

by Dick Johnson

7.02.09

A healthy, thriving honeybee colony needs thousands of foraging worker bees gathering four different natural raw materials to keep the colony alive and productive. For their nutrition they collect nectar and pollen from flowers. Nectar is that thin, watery sugar solution containing carbohydrates for energy and as the source for honey production. Pollen collection, often done simultaneously with nectar gathering, furnishes protein, minerals and enzymes for complete nutrition. Bees also collect resinous material from buds and tree bark and convert this “gummy” material into a sort of calking substance to insulate their hive. They also coat or “varnish” the hive interior with this same resin called propolis that has outstanding antibiotic properties.

Less noticeable is the collection of water, an essential component for both feeding young and environmental control in the hive. Since the queen lays up to 2000 eggs per day, as those larva hatch out –that’s a lot of mouths to feed! The nurse bees must use water to dilute the thick, viscous honey so they can feed the fast growing larva. Bee bread is a combination of fermented pollen and honey and also needs water to be used for feeding.

The other use of water by bees is to regulate the humidity and temperature of the hive interior.

During hot weather a hive may need a gallon or more of water for evaporative cooling to air condition the hive and maintain 90 degrees F. Bees spread the water around the empty cells and by buzzing their wings they create air movement to evaporate the moisture. Evaporative cooling has been measured at the rate of 580 calories heat removal per gram of water evaporated. The requirement for more or less water gathering varies during each day and the colony is able to signal to foragers whenever a change in water gathering is needed. To increase gathering, the hive bees that receive the water from foragers, meet the returning bees and eagerly unload the water promptly but if no more water is needed, the receiving bees turn away foragers who cannot find anywhere to deposit their load. Certain foraging bees specialize in collecting water from any source that they can find. They find dew condensed on grass overnight, and are often seen at the edge of a mud puddle or hanging onto a dripping faucet.

The prudent beekeeper assures that the bees have an adequate source of water for the health of the colony. If there is no stream or pond in the area, it is necessary to provide a continuous, artificial source of water. This can be a poultry type water feeder or a dripping hose or any other fresh water supply. Extra fresh water is most important especially when keeping bees in a residential or urban environment as bees will otherwise bother neighbors and their children’s pools.

## **Is Dark Honey Better?**

by Dick Johnson

6.23.09

The two popular sweet syrups— maple syrup and honey, are similar in many ways. Both are products of the dilute sugar solution produced by plants. Both are concentrated to remove excess water until suitable thick, sweet syrup is developed. To cook down maple it takes enormous energy and the process can't be rushed. For honey it requires many weeks but it's easier because the bees do all the work! Color is often used in the grading and quality of both maple and honey products. Traditionally, light colored syrup of both types has been considered to be more in demand and also sold at higher prices. Both syrups show a lighter color early in the season but later in their season they are darker in color. The darker maple is produced as the weather warms just before the buds form. The darkest (blackstrap) maple is not for table use but rather is sold for flavoring and baking. The maple connoisseur recognizes that a little "light amber" color actually has more flavor than "water white" maple syrup. The honey season from spring to fall starts with light colored honey then most nectar collected in fall produces dark color.

Every flower that produces nectar gives a different aroma, flavor and color to its honey but bees usually blend nectar from many sources. Sometimes the dominant honey plant can be identified by color and flavor. Research recently done at University of Illinois has shown that darker honey contains up to 20 times as much anti-oxidant nutritional properties as lighter colored honey. Anti-oxidant activity is known to counter toxic effects of free radicals. The general public has become aware of this nutritional difference as more customers now choose darker honey when given a choice at the marketplace.

Raw dark honey was also the subject of testing for its use in treating chronic "night time coughs" suffered by millions of children. Compared to the most popular over-the counter medicine, Dextromethorphan (DM), the dark honey significantly reduced the symptoms of coughing. "DM" is no longer recommended because of side effects to some. It is well established that a spoonful of raw honey, (any color), taken before bedtime is one of the best remedies to assure a good nights sleep. Raw honey contains many beneficial vitamins, enzymes and minerals. It is thought that dark honey gets its color from a higher mineral content. Analysis of minerals is usually shown as "ash" content and dark honey has shown 1.2% ash compared to only 0.2% for light honey. The darkest honey is the nearly black buckwheat honey, buckwheat is not grown in our part of the state. During the fall season, many plants such as goldenrod, asters and Japanese knotweed, all available locally, are dark and can be obtained from local beekeepers.

## Honeybees Chase Elephants

by Dick Johnson

6.18.09

It often has been believed that elephants are afraid of mice but according to our local elephant experts at Siam Rd, Windham, there is no truth to this “urban myth”. The only annoyance to an elephant by a mouse was observed when the mouse was stealing grain from the pachyderm’s lunch pail. Research performed in Kenya with African elephants has shown that honeybees can effectively deter elephants from destroying important food crops. Oxford University scientists, working with the “Save the Elephants” group in Nairobi have been studying the serious problem of shrinking natural habitat for elephants at a time of expanding agricultural lands. What does a 5-ton elephant eat for lunch? Anything green that he wants! This is why farmers while protecting their crops have slaughtered hundreds of elephants.

Researchers have found that honeybees will sting elephants’ tender skin around the eyes and the tip of the trunk whenever their hives are threatened. Baby elephants take years before their skin grows tough for protection and may even be killed by multiple stings. Early work on this project noticed that Acacia trees, frequently ravaged by elephants as their natural food, were always avoided in the areas where beekeepers mounted honeybee hives in the branches. Elephants in several of the local herds have been equipped with radio collars, and by GPS tracking the researchers have identified their behavior when exposed to honeybees and even with only the recorded sounds of bees buzzing. It is well known that elephants are intelligent animals and are intimately aware of sounds (big ears) and odors (big nose) in their surroundings, but observers did not expect such a prompt reaction. Experiments showed that in response to recordings of honeybees buzzing sounds, entire herds of feeding elephants have turned away from their food and left within 10 seconds.

This research has led to the development of a program to fence off certain crop ranches with various combinations of fence and hanging beehives. At a pilot study, wire fencing was used between widely spaced hanging beehives and as soon as an elephant disturbed the wire fence, the hanging hives began swinging threatening bee stings and causing the elephants to turn and run. The animals were equally deterred whether or not there were actually live bees present or with or without recorded bee sounds broadcast! Elephants do have good memories and it is apparent that they recall the experience of having once been chased by stinging bees. Their past fear of bees helps this type of “bee fence” to become effective. The researchers hope that these study results will encourage farmers in other areas to be able to protect their crops without the need of killing the raiding animals.

On an entirely different topic, have you noticed the reappearance of those pesky black flies that we had 3 years ago that would land on your arm and need to be brushed off? These were the forest tent caterpillar “parasite flies” that helped to get rid of those destructive caterpillars the following year. Well, the caterpillars are back this year too! In the higher altitudes on the mountaintop we see certain areas that have forest tent caterpillars web nests and leaf damage to certain trees. These are the ones marked with a line of white dots instead of the traditional tent caterpillars with stripes. The cherry is first to be attacked but recently I have noticed that these leaf-chewing, voracious caterpillars have selected my favorite linden or basswood trees. Contact the Cornell Cooperative Extension Service in Acra at 622-9820 if you notice an infestation of these destructive caterpillars in your area.

## **Honeybees Love Black Locust Trees**

by Dick Johnson

6.11.09

The black locust tree is a common roadside tree found throughout the mid-Hudson region. Native to Appalachia and the Ozarks, this unique tree has been spread all over the country and has even been popular in Europe since its introduction in the 1600's. No other common tree has generated so much controversy and such a strong love/hate relationship among woodsmen. It seems odd that this forest giant (80 ft x 4 ft trunk) is actually related to the legume (pea) family and is known by its Latin name *Robinia pseudoacacia*. The family relationship is readily understood by examination of the individual blossom, as each creamy-white flower in the 6 to 8 inch hanging clusters does resemble the pea flower.

The black locust, like all legumes has the property of fixing nitrogen in its roots thereby furnishing its own fertilizer and growing fast. This fast growing trait has gotten the tree into trouble with the folks who do not like its habit of sending up root suckers and the widespread scattering of fast growing seeds. In some areas where it has been introduced (like the Upper Midwest) it is considered an invasive species and various methods of eradication are recommended. The young tree is also difficult to handle as the inch long, very sharp thorns at every leaf junction protect it. The locust is a "tough" tree as it grows on almost any type soil making it ideal for preventing soil erosion and planting on mine-spoil sites. It is more drought resistant than most trees and is reported to grow in acid soil with a pH as low as 2.5!

Now for the GOOD attributes: Of course the fragrant and abundant nectar filled blossoms are one of the favorite sources of honey for bees as the bloom is in May just at the right time for the bee colony to feed their growing young bee family. Locust in full bloom are "alive" with bees and like the linden that blooms a month later, the sound of the bees can be readily heard. Carefully managed by the beekeeper, the locust can also yield a bountiful harvest of the sweetest, light colored honey that can command a premium price. The blossoms yield nectar over a 5-day period but rain can often wash out the nectar reducing the harvest. As previously reported, the record breaking cold weather on the mountaintop this spring not only prevented the locust from blooming here but even turned the small emerging leaves black from frost kill.

The locust produces a good quality lumber rated as the third most important hardwood timber species in the world. In the 1700ths it became the choice of lumber for shipbuilding noted for its excellent resistance to decay. The color of locust wood is bright yellow and in our area it is often used for firewood as it burns with a high BTU. What a pity to see it "wasted" that way, as it actually is far more useful when used as decay resistant fence posts. I have some posts on our property, along a stream, still good after about 70 years. A legend about locust decay suggests it has lasted 10 years longer than stone and 500 years when wet and 1500 years when dry!

The noted author and painter Eric Sloane often wrote about the pioneers' use of different wood for carpentry and tools. He told of the superstitions related to the black locust trees. It's easy to understand their belief when you look at the spooky, crooked leafless branches. It seems that those folks believed in witches and feared that bad luck could fall on their houses unless all four corners of the house were protected by a black locust tree. These plantings were supposed to keep the bad witches away and are still visible on farmhouse properties in old neighborhoods. I consider the black locust tree to be a valuable, bountiful gift –thorns and all!

## Late Frost and Honey Plants

by Dick Johnson

5.28.09

Last week the temperature on the mountain top dropped down to 25 deg overnight, setting a record for late spring frost for the past several decades. Certain plants are just now producing very delicate leaf buds or two inch leaves that are easily killed by frost. One of the best nectar producing trees that normally provides a large yield of light colored honey during June is the black locust tree. All locust trees from the small saplings to the giant 150 yr old veterans have suffered loss of their tender sprouting first leaves. Of course the trees will re-foliate and grow a new batch of leaves but they will not blossom as usual in late June this season and beekeepers will lose an important crop of valuable locust honey. A different but equally valuable honey plant was also frozen and all new growth killed by frost. This is the Japanese bamboo (Fleeceflower) considered by some as an invasive pest. For three successive weeks I have monitored a few patches of this roadside plant and noted the various stages of damage caused by unseasonable cold snaps. Earlier in May this fast growing plant grew up to 4 feet high with one inch stalks and damage from light frost had frozen and turned brown the top 4 or 5 inches of the tender stalks. The following week the cold caused about half of the stalks to turn brown. Then last week every plant turned black and the tall ones fell over from the heavy frost. Now (6 days later) there are new shoots beginning to emerge and I believe that by August when this plant normally blooms, it will "catch up" and produce white lacy flowers and a normal good yield of and dark delicious honey.

It is the various trees that normally produce their first leaves in late May that suffered the worst damage from this record-breaking late spring frost. Not only the black locust but also the black walnut trees suffered blackened, dead leaves in our neighborhood. Probably the very abundant ash trees that were defoliated showed even more obvious damage as there are large groves of ash trees on some hillsides where their stark, bare, gray branches contrast with the surrounding greenery of the maples and other trees that show their leaves much earlier. The bare, leafless branches remind us of the "forest" tent caterpillar invasion of May 2006 that left whole forests bare for several weeks. It appears that the fruit trees that bloom earlier in May have not been seriously affected by the recent frost. Our earliest fruit trees to bloom are the pears and plums and they were pollinated by bees in April and early May which was relatively frost-free. Apples seem to be hardy and blooming time varies with the variety. The "Paula red" is an early blooming variety and the fruit is ripe in August but the old fashioned "Northern spy" is a late bloomer (some still in flower today) but none of the apples seem to be harmed by the frost. The peach trees are late bloomers and since they have delicate buds and just opened blossoms, selected branches were insulated before the frost with toilet paper and tin foil. It's too early to know if any peaches were saved this year.

We do know that the Concord grapes emerging leaf buds were all frozen and there will probably be no grapes this year. Friends who sometimes have crops of Paw-Paw and mulberries have lost them this season. There were days in April and May that were up to 70/80 degrees and during these times the honeybees were flying and pollinating dandelions and any thing else that was in bloom. During those cold nights they just stayed home and formed a tight cluster until the sun warmed the air to 50 degrees for them to fly again. This of course is only a small selection of plants that were affected by the killing frost last week but it does demonstrate the wide climate difference and its effect on plants between the mountaintop and the towns at lower altitudes.

The next meeting of the Catskill Mtn Beekeepers club is coming SOON and will be held on Tuesday June 9th at 7:00 PM at the Agroforestry Resource Center on Rt 23 in Acra. We will continue to provide assistance to all the beginning beekeepers that have started their own bees this season. We are proud to announce that our (paid) membership is nearly 100 members and we invite any new folks who are interested in beekeeping.

## **Basswood and Honeybees**

by Dick Johnson

5.21.09

The basswood tree is found in most of the eastern parts of our country. It is also called linden, lime tree, white-wood, whistle wood, bee tree, and bois blanc. This tree is of considerable economic importance, its ornamentals and fiber for lumber, pollen and superb honey for our bees. The bark is light gray and smooth to lightly furrowed with branches reaching upward to over 150 feet with a two feet diameter trunk. The large round or heart shaped leaves, up to 5" have fine tooth edges and are asymmetrical or uneven at the stem end. The pure white wood splits so easily that it has been used for baskets and those round "Quaker" boxes sold by the Pennsylvania Dutch community. (See [www.quakerbasswoodboxes](http://www.quakerbasswoodboxes)). Berry boxes and especially square frames for comb honey used the thin white basswood, chosen for its straight grain and lightweight. Native Americans used the inner, fibrous bark (the bast) for making cordage, ropes, fishnets, matting, clothing, and baskets. The name "basswood" is a derivation from the term "bast". The beekeeper is faced with a most difficult decision: to cut down the basswood tree for the honeycomb wrapping frame, or to let it live and continue to furnish nectar for the valuable light colored honey harvest! The seeds of this tree decay slowly and may take several years for the sprout to germinate because of their hard, protective shell. The tree requires about ten years to mature and to bloom.

There are three genera of basswood native to the US including *Tilia americana* found across most of the country except the far west and the deep south. The other two genera are the *Tilia americana*, var. *heterophylla* and var. *carolina*, both native to the southeastern states. The tree is in bloom in June and flowers hang in bunches of six or more beneath a unique leaf-like bract which makes the tree easy to identify. The cream colored basswood flowers, fairly dripping with nectar have such a honeyed fragrance that you can smell a basswood tree before you see it. Bees are so intoxicated with joy over basswood flowers that, with all their buzzing, you may even hear a blooming basswood tree!

Herbalists use bark, and leaves for many ailments and recommend a citrus-like tea made from dried flowers as a nervine tonic and this is the likely source of the name "lime tree". Other varieties often used in the US as shade trees and ornamentals include the "small leaf" linden, native to Europe called *Tilia vulgaris*, made famous at the Berlin's "unter den linden" gardens. This variety is reported to be an even more dependable honey source providing a good bloom every year. Despite this claim, a well-known author and expert on honey plants (Harvey Lovell) has reported that "nine tons of basswood honey was obtained at Delanson, NY (yrs ago) and yields of 200 lbs per colony have been harvested."

According to ancient lore, the Greeks and Anglo-Saxons considered the "lime tree" sacred and held communal meetings under this tree. Legend suggests you can find calm and stillness in the presence of a lime tree and that some trees lived for several hundred to one thousand years! There are basswood trees scattered thru out the Catskill woodlands including mature roadside trees in Cornwallville.

## **Global Climate and Bees**

by Dick Johnson

5.14.09

Last year's domestic honey crop was reported as 161 million lbs up 8% over the 2007 crop, but still far below an average crop of 200 million lbs. More beekeepers have been focusing on the higher profitability of pollination services instead of managing hives for honey production. Next year the demand for pollination in California may be reduced allowing some beekeepers to stay home and manage hives for honey production. There is likely to be an even sharper international honey shortage in 2009 as a result of the increase of serious drought conditions in many major honey-producing areas.

Climate conditions in the western hemisphere are subject to the cyclic influence of the temperature of the Pacific Ocean and changing ocean currents. El Nino (warm current) strength causes increased southern US storm tracks and a hot dry western US. El Nino measurements peaked in 1998 and since then La Nina (cool current) has been building in strength and influence. A strong La Nina causes cooling and active northern storms in the US- typical of our Northwest and upper Midwest this year. The cooling trend is apparent by the record lower temperature measurements during the past two years. La Nina has also caused inadequate rainfall and serious drought during spring and summer in Argentina, one of the world's major honey suppliers. Argentina reports the worst drought in 50 yrs but also Uruguay, Paraguay and Brazil have reported five extra dry months.

California has usually been the second largest state for honey production but lack of rainfall and the rationing of water in the Central Valley will cutback all agriculture there including honey production. China used to be the major exporter of honey to the US but this winter it was hit with unusually high temperatures and low rainfall, followed by a sudden freeze. Northern China is dry in the best of times but underground aquifers are now becoming depleted in critical agricultural regions.

Cheap imported honey has held down domestic honey prices for decades but the predicted world honey shortages should strengthen prices here. In view of serious world-wide drought conditions, we who live in the Northeast, especially in the Catskills, should be grateful for our plentiful supply of high quality water resources.

## Honeybee Pheromones

by Dick Johnson

5.07.09

Honeybees communicate by issuing strong smelling chemical compounds called pheromones. These fragrances direct specific behaviors and their uses are important in the normal function of a healthy honeybee colony. Various types of pheromones are produced by queens, workers, brood larva, and drones and even guard bees when they sting. The stinger that is left in your skin gives off a scent that attracts other stinging bees to guide them to follow and continue to harass the victim (or predator). One important scent called the “queen mandibular pheromone” (QMP) is generated by the queen and it is constantly distributed throughout the entire colony by nurse bees who stroke and lick the queen. Other worker bees transfer the scent to all the thousands of hive bees and this sends a signal that “all is well” in the colony and that a healthy, productive queen is properly functioning in the hive. The QMP also sends a signal to the workers that inhibits their ovaries from developing as long as the “one and only” queen is presently performing the egg-laying in the hive.

If the queen dies suddenly, the bees can produce a new queen by producing a new queen cell built around a just hatched larva. If no young larvae are available, the lack of QMP to distribute throughout the colony will trigger development of the ovaries in several ordinary worker bees who will now lay only unfertilized drone eggs. This action by the laying workers will result in loss of the colony. Substitute QMP has been synthesized and is available to use to temporarily act as if there is a queen present. This continues to inhibit laying workers while a new queen is ordered and installed.

Another scent called the Nasonov pheromone is produced by the workers. This scent is obvious whenever a hive is opened for inspection. Bees will be observed with their abdomens raised and with wings fanning a breeze to distribute the scent. This is an alarm pheromone alerting the colony that there is a threat and preparing them for defense. The faint fragrance of lemons can be detected in the air and the bees can easily be calmed down by a few wifts of smoke from the smoker. Bees often use this same scent at the hive entrance to help guide their family bees back to their home. This pheromone is also available as a synthesized compound and is valuable to attract swarming bees to a “catcher hive” box. Beekeepers often set up empty catcher hive boxes nearby the bee yard hoping to attract a wild swarm or one from their own managed hives.

The substitute pheromones are available from bee suppliers and their use in certain cases enables the beekeeper to modify behavior patterns for better colony management. The next meeting of the Catskill Mountain Beekeepers Club will be held on Tuesday May 12th at 7:00 PM at the Agroforestry Resource Center on Rt 23 in Acra. All beekeepers and wanna bees are invited to attend. The program will be teaching about extracting the honey harvest and also reviewing the club members winter colony loss.

*Author's note: “Coincidentally, the May issue of the Bee Culture magazine carries an excellent 4 page article on the same subject of pheromones and laying workers that I received the day AFTER submitting the column to the papers for publication! Dick”*

## **Producing Delicious Comb Honey**

by Dick Johnson

4.30.09

When the honeybees make honey they seal it in a pure white beeswax cell that preserves it for their future use. Honey sealed this way has been found in Egypt still intact after 3000 years. We are most accustomed to buying honey in jars in liquid form. To obtain this easy to use liquid it must be processed by extracting it from the cells by the use of a mechanical extractor. Some beekeepers who do not own an extractor and who prefer to produce only comb honey can process and sell the delicious comb to honey customers who prefer this premium, all natural product.

Beginning beekeepers who own only one or two hives may not produce enough honey during the first few years to justify the purchase of an extractor. The option of producing comb honey instead of extracted liquid honey is especially advantageous to beginners as it assures that at least “some” of the honey harvest will be enjoyed by the new beekeeper and family this season. Comb honey requires some simple advanced planning and some different management techniques. Since the entire wax comb and the honey can be eaten, it is necessary to start with special thin, pure beeswax foundation in the frame. Recently plastic foundation made in several styles have become popular for use to make extracted honey. Plastic foundation cannot be used for comb honey. The special foundation is ordered as “thin comb” foundation and it is so thin that a newspaper can be read through the fragile wax sheet. The foundation needs to be handled gently and mounted in a wooden “wedge top frame” with support pins. This handling of the foundation needs to be done away from the hot sun as the wax may bend of its own weight. Mounting the foundation is best done in a cool room.

Usually comb honey is produced in the shallow wooden frames 5-3/8” deep. This allows for four cut-comb pieces at 4” each to be made from each frame of capped honey. If a full box is to be managed for comb honey, a shallow super box (5-3/4” deep) should be used. For the beginner who wants only a few comb frames, these shallow frames may be installed in the center of a “medium” super box (6-5/8”) during the heavy nectar flow. To raise comb honey there are two management requirements. There must be a heavy nectar flow. This usually occurs during June and early July. If raising a full shallow super of comb, it is also necessary that the bees have only the comb frames to fill and do not have available other supers to slow down comb production. Usually during this process the extra boxes of brood, bees and supers are concentrated to assure that the bees pay attention to filling the comb frames first.

This concentration of bees in crowded conditions “may” cause tendency for the hive to swarm! It is necessary to watch the rate of filling the super and to be ready to replace the empty medium supers promptly as the comb frames are filled. During the short, intense heavy nectar flow every few days the beekeeper will notice fast filling of honey in frames. It is not unusual that an entire 9 or 10 frame super (comb or extracting) to be filled in one week. Without extra empty supers to fill the hive is called “honey bound” and if new supers are not replaced promptly the hive will probably swarm. The new beekeeper can easily produce some comb honey by simply installing a few comb frames together with the regular extracting frames in the medium super.

## **Saving Queenless Colonies**

by Dick Johnson

4.23.09

April is often the time that beekeepers who thought that their hives were OK in March, are disappointed to find that something has happened and that some queens have died. Without a queen, any hive will dwindle down and surely die off. Another problem develops without the queen as result of the lack of the queen pheromone. Several of the ordinary female worker bees develop ovaries that are normally suppressed by the queen pheromone and they now start to lay their own eggs. The problem with “laying-workers” is that since they were never mated, the eggs have only the normal chromosomes and so will only develop into male, drone bees. Even though the hive will die, there still is a way that the genes of the original colony can be passed on. The drones from the failing hive can mate with queens from other colonies and thus the valuable diversity of the large gene pool can be maintained.

When the beekeeper opens the hive and sees no worker brood but instead sees frames filled with big, “bullet-nosed” drone brood, they know that the queen is gone and drone layers have taken over the colony. There is only way to ‘rescue’ this colony and it requires a special technique to follow. The entire hive with all of its boxes is removed to a distance of at least 50 yards from the original location. A new empty hive box is installed at the old site together with empty frames (preferably with drawn comb). All of the frames with drone brood are carefully brushed to remove EVERY bee. The brushed frames are placed in a spare box and kept free of bees by keeping it covered. All normal worker bees will fly back to the old location but those laying-worker bees with enlarged ovaries are too heavy to fly and will not return back to the old site. This is the time that a new mated queen can be introduced to the hive and will be welcomed as her new pheromone is spread through the colony.

The brushed off frames filled with drone brood can still be salvaged but should not be returned to the original hive as is. Drone brood harbors and concentrates the population of the varroa parasite and must be frozen in a freezer for 24 hrs or allowed to chill at RT for a few days to kill both the brood and the varroa. The frames can then be reused in a strong colony allowing bees to clean up and repopulate the drawn comb.

In other circumstances when the queen has been suddenly lost, there is often the presence of fresh eggs or newly hatched larva in some cells. The absence of queen pheromone causes the bees to immediately start to build a large peanut-sized queen cell around the young larva or egg. After feeding on royal jelly in the big cocoon, the young queen matures quickly and soon a virgin queen hatches. This young queen takes a few short flights to recognize the hive location and then on a warm, bright, sunny day she goes out for a mating flight. The queen pheromone is strong and as she flies around she alerts drones who also have been congregating in certain locations waiting for a queen. The strongest drones, usually ten or twelve of them, manage to mate with the queen and in the process fall dead after mating. The queen now returns to the hive to lay 2000 eggs/ day for a couple of years, She will not leave the hive as she carries enough sperm to lay eggs for several years, The only time that she may fly out again is in case the colony chooses to swarm.

Knowledge of the predictable biological habits of honeybees enables the serious beekeeper to salvage those threatened colonies that have suffered the loss of queens.

## **The Andrenid Bees**

by Dick Johnson

4.16.09

Recently a homeowner called about some “honeybees” in her lawn that were digging holes and buzzing about in an area that she planned to cultivate for a garden. She knew that they were not yellow jackets as they were not yellow in color. These bees were covered with hair (like honeybees) but honeybees don’t make holes in the ground like these bees. The native, solitary, bees are part of a large family of ground-dwelling bees called andrenid bees and are often observed at this time of the year. They emerge from pencil sized holes in sandy, loose soil where not covered by heavy turf grass. Leaving small piles of dirt by the hole, they congregate in large colonies often with burrows only a few inches apart. Much smaller than a honeybee they are gray and black with white hairs on the thorax.

Sometimes called “mining bees” named for the female’s industrious digging of branched burrows down to 18” underground. Eggs are laid together with nectar and pollen food supplies collected in the summer. Females are docile and rarely sting unless threatened or stepped on with bare feet. The males hover around the burrows noisily buzzing but they are not able to sting and are actually only looking for unmated females. The homeowner was advised go ahead and cultivate the area when the soil has warmed and after the bees have emerged. There is no fear of destroying valuable honeybees or the andrenid bees as the latter will merely make new summer burrows elsewhere.

Although classified as pollinators, the short adult life cycle and relatively small numbers of prodigy of the andrenid bees render them practically useless as pollinators of any significance for the food crops that are grown. Much publicity and costly subsidies have been given to the promotion of “native pollinators” to replace the important role of honeybees for pollinating our food crops. The real facts reveal that no amount of tax funding will change the biological realities and limitations of our native bees. They simply do not have the ability to pollinate the wide diversity of crops, their life cycle is too short and their numbers are much too low to be effective pollinators. The bumblebee however, a native, “social insect” like the honeybee, is in wide use nationwide, especially in greenhouses. Certainly the common andrenid and other digging bees should not be destroyed as they are harmless and do not cause any permanent damage to our property.

## **Making Hive Increases**

by Dick Johnson

4.2.09

There is an easy way to increase the number of hives or colonies for the hobby beekeeper. Following the natural tendency of a large colony of bees to swarm, the beekeeper can take advantage of the opportunity to make new colonies by “splitting” to replace any hives lost during a tough winter season. Far more cost effective than buying packages or expensive “nucs”, the beekeeper can multiply his hives without this extra cost. First year hives are not suitable for splitting, as they have not built up sufficiently to support a new colony. Over-wintered or second year colonies that are building up well with 10 or more frames of brood may be split into two hives as soon as the weather is warm enough in the evening so that the brood will be kept warm. There are several advantages and reasons why splitting a hive is done:

1-to increase the number of hives

2-to prevent swarming

3-to produce nucs

In its simplest form, a split is nothing more than several frames of brood, bees and food sources taken from a strong hive and transferred to an empty hive. This is sort of a controlled swarm, although a natural swarm does not contain brood or drawn comb. When making a split we add frames with drawn comb, brood, nectar and pollen to the split to ensure that this brand new colony will build up promptly. To start the split, simply transfer into an empty box, 4 or 5 frames of brood including capped and uncapped cells, along with the bees on those frames. Add a frame or two of nectar and pollen from the strong hive. Emerging brood need lots of food so feed the hive with 1:1 sugar water to help the colony to grow.

If you know that you have transferred brood that contains eggs or that very tiny “just hatched” larva that is less than 3 days old, it is not even necessary to add a new queen to the new split as the bees in the split will soon detect that they need a queen and will begin to raise their own new one. Bees are capable of making their own new queen from one of the VERY SAME eggs or tiny larva that would otherwise develop into an “ordinary” worker type bee. After a weeks time, inspect the frames of brood and look for “peanut- sized” queen cells hanging down from the frame bottoms. If these cells are present, wait 2 more weeks and inspect for the presence of new eggs or tiny just-hatched larva that will prove that the new queen is laying and that the new split is doing well and “queen-right”. Provided there is good nectar flow during the summer and that you do not steal too much honey, this newly split colony will probably survive the long cold winter.

It really makes no different whether the queen is in the new or old hive, as the one that does not contain her will raise their own queen. If you do know which box she is in, it’s better to move the old hive away and put the new queenless one in the old location. This causes the old hive field bees to build up the new colony faster.

Another variation of splitting methods is to add a fresh queen cell or a newly purchased queen to the colony portion that DOES NOT contain the old queen. This method ensures that the queen will be laying eggs without as much delay. One other variation is to place the newly formed split on top of the old hive separated by a screen to allow heat from the lower colony but preventing the bees from mixing. With this method, the top hive is reversed and an entrance is provided opposite the one for the lower old hive. Eventually the split can be moved to any distant location. Splits should always be made as early as the mother hive is strong enough, as it requires all summer for the new colony to prepare for the winter. Early splits may be sold to other beekeepers as nucs or kept on hand to make up for future winter losses.

The next meeting of the Catskill Mountain Beekeepers Club will be held on Tuesday April 14 at 7:00 PM at the Agroforestry Resource Center on Rt 23 in Acra . Continuing the series on training, the topic will be “Spring management-swarms and splits”

## Time to “sugar” your bees!

by Dick Johnson

3-26-09

The honeybee queen has already started to lay eggs late in the winter. The rate of laying is not as great as in the warm weather but it does help in supplying bees for early “spring foraging”. There are limited honey resources at this time of the year and the nurse bees that feed the emerging brood may run out of food. The queen is programmed NOT to lay thousands of eggs per day until natural, abundant nectar is available. Over-stimulating the colony before flowers are blooming may encourage the colony to raise more brood than they can feed and this can lead to discarding of brood or starvation. If sugar syrup (or even honey) is fed too early in the spring it must be continued without interruption until the dandelions or other flowers are blooming. This may be early April in Catskill, near the river, or even May on the colder mountaintop.

Beginners just receiving their first packages of bees, need to be certain to feed with enough sugar- especially if the local weather is too cold for nectar flow in their region. Continuous feeding of packages is needed for those that are installed before flowers are blooming. If it is too cold to install the package at once when received, keep it cool and well ventilated and spray sugar syrup on the screen- as much as they will take. Yes-honey is probably better for the bees but sugar is best to keep them alive and the 10/15 lbs of sugar needed to establish a package is cheaper than honey.

This is the time for the beekeeper to check all established hives and to estimate the remaining supply of honey. This can be done easily without even opening the hive. Hive boxes can be “hefted” by lifting and if they are light weight, the colony will not survive without feeding. Since in some areas, it is too early to feed sugar syrup, there are two other alternatives for feeding. The best way is to use a specially prepared form of “sugar candy”. This candy patty can be fed beneath the cover directly on the frame tops so that bees can feed even in bad weather. Candy patties can actually be used all winter as the bees will add to their supplies whenever it is warm enough to “break the cluster”. On an emergency basis (or for lazy beeks like me), I sometimes just spread a half pound of granulated table sugar (sucrose) on the inner cover and the bees feed vigorously on as much as I can furnish. Sugar is the preferred food over honey whenever it is too cold for the bees to fly. Honey contains some indigestible components which must be excreted outside the hive. Sugar is pure carbohydrate and is therefore completely digested. Whenever bees are unable to fly and defecate for extended periods, there is a tendency for nosema disease to develop.

It is not difficult to make sugar candy patties as long as you have a candy thermometer. The recipe is as follows:  
Stove Top Candy

- 1-Heat one pint of water to boiling in a large pot.
- 2-Stir in as much sugar as it will take, about 4 pounds.
- 3-Add 1 tsp cream of tartar or vinegar per pound of sugar.
- 4-Boil for 3 minutes, covered
- 5-Insert thermometer, boil uncovered until 234 F.

Be careful of burns, wear gloves and if burned, immediately squirt raw honey on burn to heal better and to ease the sting.

- 6-Remove from heat, and allow to cool to 200F
- 7-Whip with whisk until whiteness occurs,
- 8-Pour (QUICKLY) onto prepared wax paper or parchment paper lined cardboard tray. Or aluminum foil lined metal tray.
- 9-Allow to cool undisturbed.
- 10-Store in plastic bag till use.

## What Kind of Queen?

by Dick Johnson

3-12-09

All honeybees that we now use in North America were imported from Europe back in the 1600s. Honeybees have been kept and managed for their honey in Europe, Asia and Africa for thousands of years even 1000 BC. Queens from different parts of the world have different characteristics. Those first bees imported were from Northern Europe and were called the Dark German or Black bee (*Apis mellifera mellifera*). This variety had some undesirable traits including a defensive and nervous temperament and a tendency toward European foul-brood. German bees are not commonly used in North America now. The most popular queen used today is the Yellow Italian (*Apis mellifera linguistica*) noted for its gentle nature, quiet manner during frame handling, reluctance to swarm and the ability to handle various climates. When purchasing packages or nucs from the southern states they usually are sent with Italian queens. The main drawback of this variety is the tendency to lay large numbers of eggs all during the season. This is great of course in the spring when there is plenty of nectar and pollen to feed the young but when there is a drought in August or other temporary "dearth" of blossoms, too many young mouths to feed creates a shortage of honey that is stored for winter. Similarly in the fall, the Italian queen lays too many eggs and the young hatching bees consume too much of the winter stores. If the beekeeper does not leave enough honey for the overpopulated colony they will all starve.

Other types of queens are therefore sometimes substituted for the original queen. Alternate varieties include the Carniolian (*Apis mellifera carnica*), A dark gray bee, the carniolian builds up quickly in early spring providing plenty of foragers during the early nectar flow. If there is a scarcity of nectar in mid summer they will slow down egg laying to adjust for conditions, starting up again by September with the fall blossoms. They do not go through the winter with as large a population as the Italians and so do not require as much honey surviving the winter months. Gentle nature is typical but the only problem is their tendency to swarm in the spring. A beekeeper must be vigilant to watch for first signs of swarming and to take management steps to control it.

Another type of queen called the Caucasian or "Yugo" (*Apis mellifera caucasica*) was popular about ten years ago. They are from the high mountains of Central Caucasus, well suited for our cold winters and are light gray in color. By far the most gentle bees and recommended for beginners however the Caucasian has one major disadvantage. They are prolific gatherers of that sticky, gummy substance "propolis"! Smearing this substance between frames and boxes makes it hard for the beekeeper, in cool weather, to move about the hive components as they are "glued together" and in the summer the sticky, resinous stuff gets all over gloves, tools and hands. Caucasians also pile propolis high in the entrance hole allowing only an opening for passing one bee at a time. This reduces the necessary ventilation for the hive. These bees would need to be obtained as a special order.

The next variety of queens would be the Russians, which are growing in popularity. These are a mixed type of *Apis mellifera* from the far eastern region of Russia. It is thought that the proximity to the Asian bee, "*Apis cerana*" over thousands of years provided some resistance to the effects of the destructive varroa parasite. Many strains of Russian queens have been bred by the ARS Bee Labs and our Catskill Mtn Bee Club annually provides 200 packages of Russians for our members. Results are mixed for their resistance to the varroa parasite but most apiaries where only Russian bees are kept show a decided advantage for this variety. The last type of queen in use today is not a separate race but rather a line of queens selected for a particular trait. Developed by Dr Marla Spivak of the University of Minnesota, these "hygienic bees" will detect, uncap, and remove infected or infested brood from the comb cells. This selected behavior reduces the incidence of diseases and parasites. Hygienic bees have recently become available at a premium cost. The hygienic behavior trait may not be passed on to daughter queens depending on the mating with second generation drones.

## **California Almond Bees- Healthy but not Wealthy!**

by Dick Johnson

2-26-09

The rains have finally stopped and the almond blossoms have reached their peak allowing for full pollination of this important California crop. This has been an unusual season in many ways! The impact of weather in both long term and short term is well illustrated during this year's brief almond season. The long term lack of adequate mountain snows for several years has caused the worst drought conditions in California history. Record lows in reservoirs threaten water rationing statewide. There is not enough water for the growing populations and also for agriculture. Discouraged almond growers do not see good prospects for profitable almond crops and are actually replacing trees with other crops. This is a "turning point" in the almond industry which was previously adding hundreds of new planted acres each year.

Short term weather abnormalities have also been dramatic this year. An unusual early warm spell brought out the buds on trees in some orchards even before the beekeepers were ready to place the pollination hives. That was short-lived however, as a sudden cold snap closed up the blossoms and then the rains came for about 10 days. Since bees cannot fly in the wet weather, proper pollination was halted till the sun came out for 3 days. Some trees near Modesto (cooler weather) have still not bloomed .

Bees for pollination come from all over the lower 48 states. Those from the south and southwest have shorter travel time and are usually able to feed on natural, seasonal, nectar and pollen before they start their trip. Being well fed, they may be transported in single box "deep" brood boxes. A flat bed bee truck can get 750 of these hives on one cross-country trip. By comparison, those beekeepers from the east coast or for example, from Michigan have a couple of disadvantages. The trip is several days longer and is often through tough, cold, winter driving conditions. Bees raised in these colder regions are still dormant but must have more honey reserves to last for the long trip. Therefore bees from cold states must have two deep boxes per colony cutting down the load to under 400 colonies.

The good news is that there is practically no CCD symptoms reported in the thousands of hives now in California. This year's honeybee population shows evidence of better health than in other recent years. The bad news (at least for the local California beekeepers) is that there are too many out-of-state beekeepers with too many hives trucked there for pollination and there are not enough irrigated almond groves that need the hives. This surplus of hives has caused severe cost cutting for pollination hives.

Hives that rented for \$200 last season are going for \$45 this year. This impacts on the local beekeepers who resent the "carpetbaggers" from out-of-state driving down prices.

The weather always is an important factor on agriculture in general and beekeeping in particular.

## **Mercury in High Fructose Corn Syrup**

by Dick Johnson

2-19-09

Those beekeepers that move thousands of beehives thousands of miles following the bloom of commercial food crops must keep their bees well-fed and healthy for maximum pollination purposes. Bees require protein and carbohydrates as naturally available from pollen and nectar. While “on the road” traveling to California for almonds, Oregon for apples and Maine for blueberries, feed supplements are fed to keep the bees alive. Pollen substitutes are fed for protein and sugar is fed for the carbohydrate need. For the past few decades the difference in cost of sugar (sucrose) and corn syrup has caused most beekeepers to use the cheaper corn syrup.

Some of those migratory beekeepers have suffered the worse losses from what has been called the “disappearing disease” or CCD. Just released is a report identifying the presence of mercury in High Fructose Corn Syrup (HFCS), the most common syrup fed to honeybees. The first study published in the current issue of “Environmental Health” reported 9 out of 20 samples had detectable levels of mercury. Apparently the FDA has been working with the HFCS industry for some time to get the mercury out of the syrup. It appears that the mercury levels are now not as high as they were in 2005 in fact the Corn Industry is using this as evidence that the research is obsolete and therefore irrelevant. Another study by the Institute for Agriculture and Trade Policy, a non-profit watchdog group, found that one third of the 55 common, brand name, “sweet” foods containing HFCS, currently being sold, still tested positive for mercury. The bad news is that we don’t know whether or not any of the corn syrup processed food contains mercury. The good news is that mercury-free HFCS is available. We must ensure that food processors use only this mercury-free syrup.

The Tucson, ARS Honeybee lab is currently testing HFCS for mercury and they have also found that syrup from different producers varies in mercury and also pH level. Low pH, (highly acid) corn syrup is even more dangerous to be fed to bees. Low pH syrup when stored in an iron tank (or tanker truck) in high heat (summer in Texas) leads to formation of a syrup breakdown compound known as HMF. This compound is highly toxic to honeybees. It is interesting to note that on 2-22-07 the Honeybee Corner column pointed out that “migratory beekeepers feeding HFCS are suspicious that the corn syrup may develop toxic substances (HMF) when subject to overheating during storage” This HMF and the mercury contamination “could be” contributing factors to the mysterious CCD problem.

Back to the unusual weather conditions affecting the almond pollination. California is suffering the worst drought conditions in history. Snow fall in the mountains will simply not supply the aquifers with enough water for the demand. Despite the long- range water shortage, the region continues to be hit with unusual days of a cold, wet weather system that has stopped the bloom in its tracks! The good news is that maybe some of the local drizzle may help irrigate the trees but the bad news is that the bees may not pollinate well as they don’t fly in the rain.

## **Honeybee Corner**

by Dick Johnson

2-12-09

Can Honeybees recognize the beekeepers face? New research by Dr Dyer from the Monash Univ in Australia, published in the science journal "PloS ONE", indicates that bees can learn to recognize human faces even when seen from different viewpoints. The research has shown that the bee brain, containing less than 1 million neurons, is good at learning to master complex tasks. This research could be applied in the areas of new technology, particularly the development of artificial imaging systems. Computer and imaging technology programmers who are working on solving complex visual recognition tasks will find this research useful. Most current artificial intelligence recognition systems perform poorly at reliably recognizing faces as seen from different angles however the bees do better. They can recognize novel views of rotated faces using a mechanism of interpolating or image averaging from previously learnt views. Despite the limited neural brain capacity (0.01% the size of the human brain), their ability has evolved so that they're able to process complex visual recognition tasks. The researchers used different groups of bees and by selectively giving sweet or bitter rewards for their performance, found ways to teach the bees. They found that when bees had learnt to recognize a face as seen from two viewpoints they were able to later recognize a third and novel view of the target face. If however they had been trained on only a single view, they could not recognize (a different) novel view.

The almond blossoms are open in northern California but the 2009 season does not look good for the industry. After three successive years of record bumper crops this season will be less productive. The main problem for the almond orchards is the serious drought conditions throughout the state. For three years the water shortage has grown worse each year has been made more acute by only 61% snowfall for water from the mountains and only 1/3 normal rainfall this winter. An estimated 20% of the almond trees will not have sufficient irrigation and so they are being taken out of production. The unusually warm February has caused some trees to blossom 10 days early, which may happen even before some of the migratory beekeepers can transport their hives to the orchards. High demand for bee hives to pollinate in previous years caused the cost of renting hives to raise to record levels of \$150/\$160 per hive. This year there are already too many hives transported to California and not enough orchards that need them. Pollination contracts will probably be renegotiated for lower prices per hive according to supply and demand.

As if these are not enough problems for the migratory beeks, the state of California, in a move to make up for the budget shortfall, has just furloughed the CPFA inspectors and the Plant Pest Diagnostic Labs on the 1st and 3rd Friday of each month. This means that after several days trucking several hundred hives across the country, the bees may suffer from an extra 3-day weekend on the truck, waiting for inspection and suffering from lack of food.

The Catskill Mountain Beekeepers Club will hold the second annual beginners beekeeping course on Feb 14 from 1:00 to 4:00 PM. Held as usual, at the Agroforestry Resource Center, Rt 23 in Acra, reservations may be made @ 518-622-9820

## Wanted ! Beginning beekeepers!

by Dick Johnson

1-22-09

20 years ago it used to be easier to be a beekeeper. Back then you only needed to install bees in the hive and harvest the delicious honey in the fall. Since then the entire beekeeping industry has been made more difficult because of the introduction of several new diseases and parasite pests that have nearly wiped out all of the feral (wild) bees in the forest. The increase in international trade has allowed these parasite “stowaways” to invade our country and to wreak havoc among our colonies. Without their natural enemies, these pests have caused serious damage. By now just about every known bee disease and parasite has been spread to every country. (This also includes a few unknown diseases not yet ID'd). There is a need for more beekeepers to cut down on the importation of bees and honey. For example in 1987 there were 3.6 million beekeepers but by 2007 the number was reduced to 2.4 million. Bee clubs have been trying to create interest in beekeeping and your local Greene County, Catskill Mtn Beekeepers Club has planned two beginners training classes. The first class (of 25) to be held on Jan 24th is already sold out (as it was last year). The next class will be held on Feb 14th and will fill up fast-so call for your reservation (see below).

Despite these recent problems, many “newbees” have met the challenge and are successful in the fascinating and rewarding hobby of beekeeping by proper management training. Here is a general introduction and schedule that needs to be followed by the beginner for them to get started with bees this season:

How to start:

- 1- January-Join a local honeybee club, Catskill Mtn Beekeepers Club meets 2nd Tuesday at 7:00 PM in Acra at the Agroforestry Resource Center. Phone 518-734-4629 for info.
- 2- February-Attend a introduction beginners course, next course scheduled for Feb 14th, for reservations 518-662-9820
- 3- Read and learn as much as you can about beekeeping from books, tapes, the internet and bee club friends. Subscribe to one of the beekeeping magazines-get 25% discount from bee club.
- 4- Order BEES as early as possible. Bee supplies are short this year and you need to choose the supplier and kind of package or nucleus with help of your mentor.
- 5- March- Order supplies-look for a beginners kit with hive boxes and equipment. Assemble all hive boxes and foundation in frames.
- 6- April-Choose proper location and plan for bear fence if needed. Schedule delivery of bees according to local weather. Try to install new bees about dandelion bloom time.
- 7- May-Feed new packages, check for good laying queen and parasites. Established hives- watch out for swarms. Watch your bees bring in multicolored pollen from hundreds of fruit trees and spring flowers.
- 8- June-Split hives with extra brood, order extra queens. Add new super boxes for honey crop. Sit along side of your hive, watch the activity at the entry and inhale the delightful aroma of the ripening honey.
- 9- July-Harvest early honey, extract and return supers for later harvest. Make up splits and nucs for next season. Observe the increased yield of vegetables in your garden as your bees pollinate them.
- 10- August- Take off late honey harvest. Plan for fall disease or parasite management as needed. Do not collect any honey in supers while applying any medication.
- 11- September-Heavy nectar flow from goldenrod and asters may be harvested if no medication in use or else leave on hive for winter colony supplies. Be sure to leave enough honey on each hive for them to eat and keep warm all winter.
- 12- October- Install entry mouse screens at first frost. Begin plans for winter hive protection. Wind protection and ventilation are needed.
- 13- November- Put the hives away for the winter and wait for next spring. Enjoy your first honey harvest and give away or sell your surplus. Continue to attend bee club meetings and share your stories and new fun