

[EMAIL](#) [WEBSITE](#) [FACEBOOK](#)



Clinch Valley Beekeepers

- meet every 3rd Thursday
- doors open at 6:30
- meeting starts at 7:00
- potluck dinner 7:30
- lesson/presentation 7:45
- hall cleanup immediately after presentation

Treadway Fire Hall
189 Highway 131
Treadway, TN 37881



IN THIS ISSUE

- [Last Meeting](#)
- [Next Meeting](#)
- [Speaker Notes](#)
- [Message from the Secretary](#)
- [Upcoming Events](#)
- [Hive Calendar](#)
- [Happenings](#)
- [Bee Insights](#)
- [The Honey House](#)
- [Studio Project](#)
- [Honeybee Lunch](#)
- [Bee Quote](#)
- [Bookshelf](#)
- [Poets Stage](#)
- [Bee Funny](#) - [Answer](#)
- [Apiary in the Neighborhood](#)
- [Pollinators Garden](#)
- [Apiary Management](#)
- [Beekeeping History](#)
- [Buzz Art Gallery](#)
- [Kids Corner](#)
- [Recipe from the Hive](#)
- [Bee Marketplace](#)
- [Mentoring](#)
- [Library](#)
- [Membership](#) [Reminders](#)
- [Club Address](#) [Officers](#)

Volume 14, Number 12

December 2023

Sherri Hudson, editor

TO INSULATOR or NOT TO INSULATE

**Save The Bees:
They Help Keep
The World Sweet.**

BEESWAX:

**USES for NATURE'S MOST
VERSATILE PRODUCT**

NEXT MEETING

DATE

Hall
189 Hwy 131 Thursday, Dec. 21, 2023

- doors open at 6:30
- meeting starts at 7:00
- potluck dinner 7:30
- lesson/presentation 7:45

Treadway Fire

Treadway, TN 37881

Please note that if School is cancelled in Hancock County, we will **NOT** have the meeting.

FOOD THEME

Holiday Feast Potluck

It is believed that the forerunner of the Christmas dinner was the midwinter feast enjoyed by our ancient ancestors. Feasts were held to celebrate the pagan midwinter solstice, and archaeological digs have discovered that the most popular meats served up were pork and beef. Pork would be cooked over spits, while beef would be chopped up and used in hearty winter stews.

To accompany the feasts, seasonal fruits were consumed, such as crab apples and berries.

The feasts of our ancestors were a lot different from the Christmas dinners we know and love today, but the basics - roast meat accompanied by a selection of trimmings - were already there many centuries ago.

When the Romans conquered Britain, they brought with them their own gods and their own festivals.

The main winter celebration was the Saturnalia, held between the 17th and the 23rd of December to honor Saturn, the god of seeds and sowing.

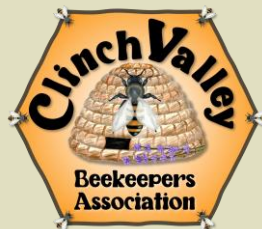
The club will supply the meat.

Members and guests are asked to bring their favorite side dish, casserole, vegetable, bread, salad, or desert.

NEXT SPEAKER

There will not be a guest speaker for December's meeting. Instead, we will be having a Christmas party. There will be a carry-in dinner, fellowship with other beekeepers/families, and a holiday game called Dirty Santa. What better way to get into the Christmas spirit than with some gift giving and stealing? If you don't know what Dirty Santa is click here to learn more.

LAST MEETING



- The November meeting opened with prayer by the President, Lloyd Snelson Jr.
- There were 23 members and guests in attendance.
- The current financial report was given by club treasurer Linda Eskola. It was then approved. Jr. thanked the members who helped at the festivals in October.
- Discussion about having a Dirty Santa game at the next meeting. It was agreed upon. To find out about Dirty Santa [click here](#). Bring a wrapped gift new or used if you want. This is an option since there will be plenty of gifts for all so if you can't bring one that's no problem. No \$ amount specified and no theme, but beekeeping is always appropriate for our group. Bring your family!!!
- There will be a board meeting Dec. ?.
- We were reminded that membership dues are payable at the Jan. meeting.
- With no further business, the meeting adjourned, and we enjoyed a very nice meal.
- Thank you to all who brought dishes and those who served and cleaned up after the meal.
- Hope to see you December 15th.

SPEAKER NOTES

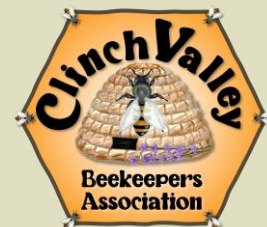
Last month we enjoyed a different type of program. Since we had a big Thanksgiving - Friendsgiving feast, watched an entertaining and informative movie

"My Garden of a Thousand Bees"

by acclaimed wildlife filmmaker Martin Dohrn, who locked down by coronavirus, turned his lenses on the surprising and spectacular bees living in his own urban garden in Bristol, England. Viewers marveled at moments timely captured in My Garden of a Thousand Bees, such as bees laying tiny eggs preparing for the next generation, green-fanged spiders feasting on male flower bees and a female yellow-faced bee attacking a Gasteruption wasp to protect her nest. Other fascinating behavior featured in the program included two male bees fighting each other over a female, different species of bees competing over territory and one busy bee building a nest with a shell and hundreds of sticks. Intrigued by the intelligence of one particular wood-carving leafcutter bee, Dohrn dubs her "Nicky" and sees life at her level as she leaves a lasting legacy in the garden.



MESSAGE from the SECRETARY



Hello Everyone,

• I want to remind all of you that **membership dues** are payable the 1st of the year. Dues are not pro-rated.

• Website

I have redesigned our **website**. Hope you like it. Please check it out. There are a few features I'm still working on such as taking membership/donations/sales online. My plan is to have this feature available by January 2024. I also generated a QR Code for the website. Test it out and share it with others.

This is what you can find on our website:

HOME

ABOUT

MISSION STATEMENT

BYLAWS

COMMITTEES

MEETINGS - LESSONS - THEMES

RESOURCES

NEWSLETTER

BEE KEEPING CALENDAR

HOW to BEE SAFE

JOIN US

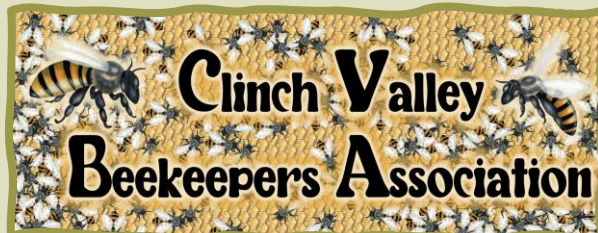
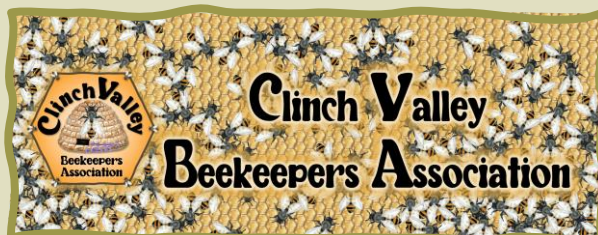
DONATE

MARKETPLACE

CONTACT

HEAD BEES

CVBA INSPECTORS



These are the new masthead of our **website** and **Facebook** page.

• Please return library materials!

Many items are missing from our library. Please return your CVBA library items by bringing them to the monthly meeting or mailing them to:

Cinch Valley Beekeepers Association,
PO Box 736, Sneedville, TN 37869

Thank You! *Sherri*

• **Swarm List** - If you would like to be notified of a swarm in your area, we would like to add a page to our website that list anyone who removes swarms. Please see or email the secretary.

cvbanewsletter@gmail.com.

• **Speaking Engagements** - CVBA gets many requests from schools and community organizations to provide speakers about honeybees, but we often cannot fulfill these due to lack of volunteers. If you like talking about hone bees, please sign up to be on our speaker list by emailing

cvbanewsletter@gmail.com

• Apiary of the Month

is searching for members who want to display their apiaries in our newsletter.

This is a way of inspiring others and for others to recognize your hard work. Please submit a photo of your hive (you can include yourself in the photo) to:

cvbanewsletter@gmail.com.

HIVE CALENDAR

Of course, all dates are approximate, and dependent on weather...

December has quite a lot of fair weather here in the South. Watch the weather predictions and plan to do a varroa mite treatment on one of those fair-weather days. You can do this last treatment any time after brood is no longer present in the hives - usually by Thanksgiving. Oxalic acid - either vapor or trickle - can be done almost any time regardless of the temp. MAQS requires a day warm enough for the bees to fan - preferably 2-3 in a row. OA vapor doesn't even require opening the hive. If you plan to do **Mt Camp sugar** as an insurance action after you do your mite treatment is the ideal time

UPCOMING EVENTS

December 6 at 6:30 PM : The CVBA Board will meet at Lynda Eskola's home. As always, any member may attend, however only board members can vote. If you have a topic for discussion, please call Lloyd. Snelson (president) whose number is on the last page of the Newsletter prior to the meeting.

• The excitement for Hive Life 2024 is building up - we can't wait to see you there! Secure your one- or two-day admission for Hive Life.



BEE FUNNY

Why did the bee go to the dermatologist? (answer on last page) 3



APIARY in the NEIGHBORHOOD



This feature is for CVBA members to show off your apiaries.
Send me your photos and videos of your apiary with a short description and we will publish it here.
This month we visit **Leigh Ann & Kirk Brink** of Greenville.



I started keeping bees in 2012 when we moved from Mountain City to Greenville.

Our daughter was in school & I knew I would not be going back into nursing or early childhood education again so I thought beekeeping would keep me learning. I haven't looked back. The first value added product was the moisturizer. Then my sister asked if I would make something with propolis, so, I made the throat spray and salve. So many people have had good results with these products it fills that "nurse-wanting to help" spot.

Of course, I make candles also. I have been working in the herbalism direction for the past two years. I have really enjoyed this career also.



I entered 3 Fairs this year. Greene Co, Appalachian & Tennessee Valley fair.

I won the Rosette overall, first place in Greene & Appalachian plus, second place over all in TN Valley Fair



Entering the Fair competition can get you free money



I was hopeful for a fall honey crop. We had 3 acres of wingstem blooming. However, no rain no nectar. Still the honey yield was better this year than 2022.



The pollinator field struggled this year with fluctuating temperatures, grass & drought. Photo by member Leigh Ann Brink.





APIARY MANAGEMENT

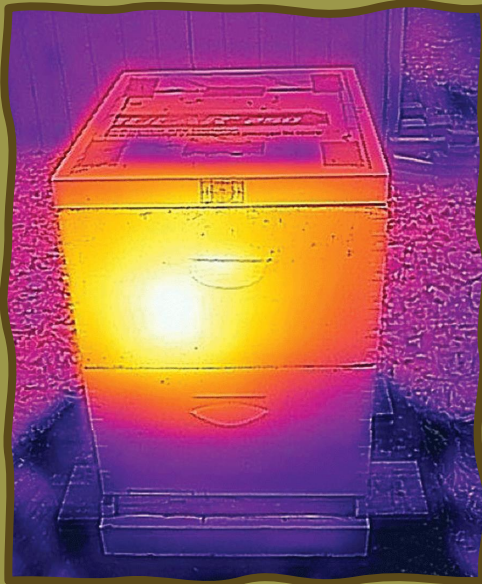
Researched by
Sherri Hudson



TO INSULATE or NOT to INSULATE

By: William Hesbach

During Winter, bees cluster in a configuration that has a dense outer layer of older bees, sometimes referred to as a mantle, covering an inner core of more loosely packed younger bees. The cluster responds to changes in temperature by expanding to dissipate heat and contracting to conserve heat. Bees can precisely position their bodies in layers, so their thoracic hairs interlace. Since a bee's hair has similar properties to down, bees resist heat loss, and their layered bodies close off ventilation through the cluster and between combs.² As an interlaced cluster they form a naturally efficient insulation cooperative.



An infrared photo reveals a tightly packed Winter cluster. The bright yellow indicates the warmest part or the center of the cluster. Away from the center the color darkens, as the temperature is lower.

As the body temperatures of the mantel bees fall, they generate heat by using their indirect flight muscles to shiver. While shivering, bees are using fuel, oxygen, and exhaling carbon dioxide. Their respiration, in combination with reduced ventilation, creates an environment with increased carbon dioxide and reduced levels of oxygen. Both these conditions would be toxic to humans, but to bees these alterations are intentional. The changed environment around the cluster induces the bees into an "ultra low metabolic rate" which conserves energy and traps some needed humidity. There is also some research indicating that a higher level of carbon dioxide increases the mortality of wintering *Varroa*.³

The temperature of bees in a cluster are regulated in three different ways, first by conduction because they are touching, then by radiant heat from bees nearby, and finally, with convection via air movement. When bees cluster tight and shiver, the heat they generate reaches down to the core. At the core, the temperature would continue to increase until the cluster overheats, but instead, the younger bees at the center expand and loosen the core allowing excess heat to flow back to the outer layers of the mantle. In this way, the heat being generated in the mantle layers is equalized and distributed by the action of younger bees at the core.

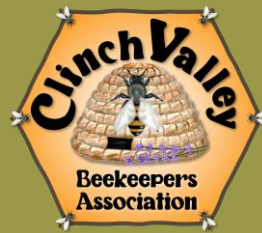
Ultimately, the heat dissipates from the mantle's surface into the convective airflow around the cluster. Heat dissipation plays an important role in understanding how the size of a cluster matters to heat loss and winter survival.

The larger the cluster, the less the surface area represents the total mass of the cluster. The opposite is also true, and in a small cluster, the surface bees represent more of the cluster's mass.

To understand this better, visualize a cluster of just one bee. In a one-bee cluster, 100% of the surface area and 100% of the cluster's mass is represented in the single bee. Convective flow around that one bee will also cool the entire mass of the cluster because they are one in the same. If we add another a bee, the cluster's mass is doubled, but the surface area is not increased by the same amount. As we continue to add bees, the surface area becomes less and less representative of the total mass of the cluster. The surface area is critical because that's where heat dissipates and if that surface represents less of the cluster's mass, the cluster can retain more heat and stay warmer. It's why a dog or a cat curls in a ball to sleep; they're protecting their core temperature by reducing the surface area exposed to cooling. Maintaining core temperature is the key to Winter survival and is also where insulation can make a critical difference.

As beekeepers, we can't control thermoregulation, but we can influence heat loss in two significant ways. We can manage the convective flow by keeping the air as still as possible around the cluster, and we can add insulation to the hive body to help conserve some of the heat.





How Insulation Works

To aid in understanding how insulation and air temperature play a role in over-wintering colonies, it may help to visualize the cluster as if it were a stand-alone hot-water tank. Water inside is maintained at a steady temperature, and the amount of fuel used to heat that water depends on both heat lost to the surrounding environment and the insulation quality of the tank. If you want to save money on heating fuel, the first thing you are advised to do is insulate the tank. The reason insulation conserves fuel is because it resists the natural movement of heat to cold and therefore, the heat that's generated takes longer to migrate away. The same thermal transfer takes place in a bee cluster, and the same conservation of heat applies when you add insulation around a hive.



With the physical comparison between a single deep box and a bee tree, it's easy to see that there's little insulation value in a thin box compared to the mass of a tree.

In a natural bee cavity, insulation is provided by the surrounding mass of the tree. Above and below the colony is an almost infinite amount of insulation and the outside walls can be virtually any thickness, but more typically range from three to five inches. According to universally accepted standards, soft pine offers an R-value of about 1.12 per inch. Therefore, the $\frac{3}{4}$ inch pine boxes we typically use provide an R-value of about 0.84. Conversely, a colony surrounded by five inches of wood in a natural softwood tree benefits from an R-value of about 5.6 or about six times the insulation quality of a typical bee box and that's just the outside walls.

The real contrast in R-values is evident when you compare the insulation quality of what a tree provides above and below the cluster. A typical commercial box sits on an open bottom board, which offers little to no insulation value below the cluster. Above, the combination of an inner cover and telescoping cover provides some insulation, but not much. Also, if the inner cover has a bee escape hole, with a notch on the outside rim, the insulation value is near zero. That's a problem and especially on top where warm moist air will

accumulate. If that warm moist air meets a thin cold surface or an open bee escape hole, it will condense and dump cold liquid water back onto the cluster. Bees can tolerate extremely low temperatures while dry, but if you wet them in cold temperatures, they will die.

In a recent study, researcher Derek Mitchell went beyond simple R-value calculations and used his physics background to apply known thermal mass calculations to compare the heat transfer (loss) of a tree to that of man-made hives. His research indicates that a thin man-made box will lose four to seven times more heat than a typical tree colony and that some behaviors may be driven by that fact.

"Many honeybee behaviors previously thought to be intrinsic may only be a coping mechanism for human intervention; for example, clustering in a tree enclosure may be an optional, rare, heat conservation behavior for established colonies, rather than the compulsory, frequent, life-saving behavior that is in the hives in common use. The implied improved survival in hives with thermal properties of tree nests may help to solve some of the problems honeybees are currently facing in apiculture."

Mitchell makes a strong case for adding insulation to an overwintering colony, but he also makes a case for more year-round insulation. Mitchell is hardly the first to consider the difference between trees and thin pine boxes. Langstroth's first hive was double walled, and he advocated filling the dead-air space between with a non-conductive material like charcoal or sawdust, "to enable the bees to preserve with, the least waste, their animal heat."

Some manufactures recognize the need for more insulation and today we're seeing hive bodies offered in lightweight insulating materials like high-density polystyrene. Polystyrene boxes have been used in Europe for many decades, and the characteristics are well documented. But in the U.S., wooden boxes dominate, and there still seems to be a lingering discussion about the need for adding insulation.





Arguments Against Insulation

There are a few standard arguments often advanced against insulating. The first being that insulation will make bees more active at times and use more stores while they're moving around - and that's true. An important thermology study of wintering bees⁷ concluded that colonies with insulation have more relaxed clusters, and, therefore, bees have the ability to move around more when compared to uninsulated colonies. But that only allows bees to have greater access to stores and avoid starvation. To the contrary, it's not uncommon to observe that a starved colony left behind plenty of honey because it was just too cold for the cluster to move and consume them.

Another common objection is that insulation will cause the colony to remain cold as the outside temperature warms, and the bees will miss opportunities for cleansing flights on warm winter days.

But as the thermology study documented, bees in insulated colonies reacted to changes in outside temperature at basically the same rate as uninsulated colonies. Bees break cluster based on the temperature of outside air drawn directly into the cluster, not the temperature of the hive body or the surrounding honeycombs.

Contrary to the belief of some, insulation does not add heat - it can only help contain heat already generated.

As such, insulation will not provoke bees to fly when it's too cold causing them to die as they exit the colony - they do that with or without added insulation.

When considering arguments that advance the notion that added insulation will harm your bees, it's important to remember that bees have lived in well-insulated natural cavities for thousands of years.

Finally, during a Winter when a colony will need almost all the honey it has for survival, insulation can make a critical difference. Even in Winters when insulation may not play a significant role in survival, the bees can benefit from less cold stress and emerge in spring healthier. Improving the insulative quality of the habitat we provide our bees is just moving them closer to life in a more natural enclosure.

Ventilation In a Langstroth Box

Ventilation is both complicated and interesting when wintering bees, and although I've separated the topic from insulation, how you use ventilation will determine the effectiveness of your attempts to insulate. The complicated part is understanding whether it's bees in the cluster that need ventilation, the Langstroth box that's made ventilation necessary, or a combination of both. It's always interesting to observe that bees in fall make every attempt to close all seams and holes in their hive - are they trying to tell us something?

How Convective Flow and Condensation Work

In a bee enclosure, where bees are the source of heat, there is a natural convective flow. Heated air has the characteristics of being both more buoyant and capable of holding more water vapor than cooler air. As bees breathe and metabolize food, the heat they generate provides a constant upward convective flow of warm moist air. What happens next depends on the type of enclosure.

In a natural tree cavity, which is a tall cylinder, the moist convective flow reaches the top of the cavity and meets a warm surface with a physical vapor barrier. The warm surface is there because the tree offers, as mentioned earlier, an almost unlimited amount of insulation above the cluster which is resisting heat loss. The vapor barrier is there because the bees have placed water-resistant propolis over the entire inner surface of the cavity. Since the top is warm, and heat seeks cold, the warm flow spreads along the top seeking the cooler surfaces of the cylinder walls. Warm moist air and a cold surface will cause condensation. The condensation happens because as the air's temperature is lowered, it loses its ability hold water vapor. As the water vapor condenses out and turns liquid, the hive's humidity level is lowered, and the process gives back latent heat to the enclosure. It's a perfect balance made better by the fact that the bees select cavities where the entrance is positioned away or lower than the center of the Winter cluster⁹ so any cold air coming in, falls to the bottom of the cavity mostly avoiding the actual cluster. At the bottom, excess humidity remaining in the falling air condenses out into the compositing detritus on the bottom.² Also, since the cylinder is long, the cluster has more surface comb to allow for a Winter position farther up into a warmer space as needed.





APIARY MANAGEMENT

CONT.

To Insulate or
Not to Insulate



This condensation pattern indicates how a warm telescoping cover will redirect hot moist air to condense away from the cluster's center - notice the dry center.

In a thin wooden man-made enclosure, things are much different. We've already discussed the difference in insulation quality, so what happens in this box follows the same principles of thermodynamics, but with a different outcome.

For the purpose of comparison, I'll assume an uninsulated box with a typical inner cover and telescoping outer cover.

The warm moist air rises, and the first thing encountered is a thin cold inner cover where condensation will occur and, in this case, it will occur directly over the cluster. Bees can tolerate cold well below -20°F but drip cold water on them at 32°F, and they die. It's no mystery that having observed this, beekeepers want to ventilate the moist air before that happens. For many decades, beekeepers have devised ways to use the inner cover's conveniently placed Porter bee escape hole to ventilate all that warm moist air, without regard for the consequences of lost heat.



What Happens When You Add Ventilation

Ventilation provides some level of humidity control by directing the cluster's warm convective flow to the outside, but the consequence is the removal of needed heat. A few important questions come to mind. First, as beekeepers, we know how to keep condensation levels down by adding lots of ventilation, but do we know enough to understand how to balance ventilation with the needs of wintering bees.

The complication arises from the fact that natural humidity levels change in response to many ordinary variables in the daily life of the colony. Therefore, a fixed amount of applied ventilation will not accommodate those natural fluctuations.

How much ventilation is required, and when to adjust the amount, is not known. It's not even definitively known if bees attempt can control humidity, or if they just adapt to naturally occurring levels. What is clear is that bees need some of the condensation they generate to hold heat in the enclosure.

Also, we've known for some time that humidity plays a significant role in Varroa reproduction, with optimum humidity for reproduction ranging from 55% to 70% and only limited reproduction taking place at higher humidity. So, a real contemporary question is does added ventilation aide Varroa reproduction.

The next question is how much of our current practice of provisioning 60-100 lbs. of honey per wintering colony, then providing supplemental fondant, and in some cases ending with the need for emergency food, is being driven by removing lots of heat the bees must replace?

E.B. Wedmore calculated the amount of honey required to overwinter a measured population of bees in his influential 1947 book, *The Ventilation of Bee-Hives*. Wedmore converted the caloric content of honey to watts and then using wattage he calculated that the basic needs are about three lbs. per month between mid-October and mid-April. Therefore, if Wedmore is correct, and the primary Winter honey requirements of an average population of bees are in the range of ~21 lbs., it seems like our need to provision Winter stores at four times that amount, may indicate something about the burden on bees to generate additional heat beyond their basic needs. One obvious reason is the loss of heat by an abundance of added ventilation.

There's no question that ventilation is needed, but I think if we could refine our understanding of how much is needed and when, modify our boxes to direct the convective flows away from the cluster's center, and increase insulation around the Winter cluster, we could help our bees live healthier, lessen the burden of Winter provisioning, and reduce Winter losses.





Insulation Options

When the subject of adding insulation comes up, it invariably starts with wrapping a colony with tarpaper. Although tarpaper is not insulation, because it has no R-value, it has historically been used in combination with insulation material as a way to keep them dry. Early use of tarpaper included covering leaves or straw after they were packed around colonies. If you're not interested in insulation and only require a water shield or windbreak, tarpaper will work, but advances in energy efficient house wrap made of woven polyester, designed specifically as moisture and air infiltration barriers, are another option.

Many commercially available Winter wrap systems simplify the process of insulation. These kits offer an inner core of bubble wrap or fiberglass and an outer covering of black plastic. Some with a fiberglass core offer R-8 insulation. They are simple to install, provide adequate insulation, but are only operating on the vertical box surfaces.

The vertical sides represent about 25% of the total heat loss with the remaining heat exiting from the top. That means that almost 75% of a colony's Winter heat loss is unaddressed unless you use commercial side wraps and add insulation to the telescoping cover.

One product discussed as insulation is Homasote. Homasote is a mixture of recycled sawdust and newsprint in combination with insecticides and microcrystalline wax. When thoroughly dry, $\frac{1}{2}$ inch Homasote has an R-value of 1.20. Beekeepers sometimes put Homasote over their inner covers to act as insulation and as a moisture collector, but those two functions can oppose each other. Homasote's intended use is in dry building cavities where liquid water or excessive water vapor can problem. To combat this, Homasote added microcrystalline wax to delay vapor saturation.

But since Homasote is paper, it will collect moisture, which is an advantage if you're using it for that purpose, but once Homasote starts to collect moisture, its R-value declines. So, if you decide to use Homasote as insulation or a moisture collector, consider its properties and use it accordingly. The "moisture boards" sold commercially are made of Homasote or a very similar product.

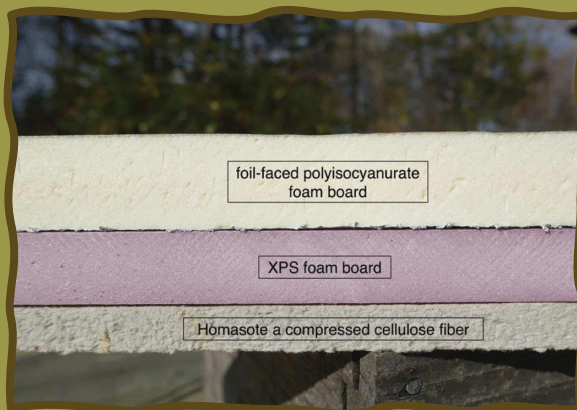
If you want insulation approaching the quantity of a natural tree cavity, the best insulator is sheet foam. Sheet foam comes either as pink extruded polystyrene (XPS) or foil-faced polyisocyanurate. These insulators resist moisture and provide excellent R-value in the range of 5-7.5 per inch.

Sheet foam's insulation quality will not degrade in the presence of moisture and, therefore, will provide constant R-value in all conditions. Sheet foams can be fashioned into sleeves that slide over the colony for complete sidewall insulation, and sheet foam's biggest advantage is when it's used for both sidewall and top cover insulation.

Not All Foams Are The Same

XPS is rigid, easily cut, and offers about R-6 per inch. XPS can withstand a short exposure to sunlight, but the manufacturer recommends painting it or covering it with a house wrap or tar paper. When used in the telescoping cover where bees can access it, they sometimes try to chew it out, but you can stop them by covering it with a thin plywood sheet or a screen.

Foil-faced polyisocyanurate foam, sold under different brand names, is a premium product designed to both insulate and reflect infrared heat. Reflecting infrared heat is a valuable way to conserve heat. To use foil-faced insulation as an infrared reflector, you must provide an air space between the infrared heat source, which is the bees, and the foil surface.



Foil-faced, polyisocyanurate offers both dense insulation and reflective qualities. Pink XPS board provides insulation, and Homasote a compressed cellulose fiber product, offers lower insulation but good water vapor retention.





Details For A Winter Cover With A Built-In Winter Feeder

You can use the following construction details with either XPS or foil-faced foam. If you use XPS, the sleeve should fit snug around the box and if your boxes are anything like mine, they're sometimes misaligned or slightly different dimensions so don't make the sleeve fit tightly, or you may find that you can't get it on. With XPS you are also advised to protect the surface from the weather and sunlight. If you use foil-faced poly, you can fit the sleeve snugly or build in an air space to reflect infrared heat, which will increase the insulation quality of the whole project.

I'll explain the details for using foil-faced poly combined with an air space to reflect infrared heat.

If you want a simpler snug fitting sleeve, just eliminate the details concerning the air space.

With the writing on the foam sheet facing out, construct a sleeve that's the total height of the boxes you're overwintering in, plus the height of an Imirie shim used for feeding, plus an additional $\frac{1}{2}$ inch.

The $\frac{1}{2}$ inch air-gap is incorporated into both the sides of the sleeve and the top. When you build the $\frac{1}{2}$ space around the sleeve, it will work even better if you ensure that the space around the sleeve's Bottom is sealed to prevent airflow; you want the $\frac{1}{2}$ inch space around the box to be as close to dead air as possible.



Figure 6: When the telescoping cover is in place, this $\frac{1}{2}$ inch space will help reflect infrared heat back to the cluster. Radiant reflection is used for thermal efficiently in the building industry and works equally well when applied in beekeeping.

For the sleeve's rectangular dimensions, just measure your boxes and add one inch to both measurements - remember to measure twice and cut once. When installing the sleeve, it's best if the sleeve rests on a support that's level with the seam between the bottom board and the bottom box. Otherwise, the sleeve can tilt, or slip down, and cover the front entrance. I install a small shelf of wood that supports the foam and keeps everything at the correct height (Figure 7). Next, install screen on the shim (Figure 6). The screen on top of the shim prevents bees from occupying the $\frac{1}{2}$ space above the screen, and the space under the screen is convenient for winter-feeding. If you don't screen the shim, the bees will gather against the under surface of the foam. They like it there because it's warm, but their bodies will conduct heat and partly eliminate the reflection of infrared heat.

The final piece is a rectangle cut the same size as the outside dimensions of the sleeve. You can now place that rectangle on top of the sleeve. I like to then build a telescoping Winter cover that fits over the sleeve and insert that piece into the underside of the cover. I have also used a flat piece of plywood with a stone weight or ratchet strap and there's lots of other ways to add some cover on top.

Lastly, the sleeve and top cover are not intended to be airtight. If you use a screen bottom, you should block it against a sudden cold updraft, but it's not necessary to seal it tight. You may see liquid moisture at the corners around the top and you may also see some in other places indicating air infiltration, and that's OK.

Those indications are proof that your system is working, and that condensation is occurring away from the center of the cluster and also, that the bees are not sealed in too tight. So, have some fun, keep your bees a little warmer this Winter and there may be a few more around to greet you come spring.

William Hesbach is an EAS Certified Master Beekeeper and sideline beekeeper in Cheshire, CT



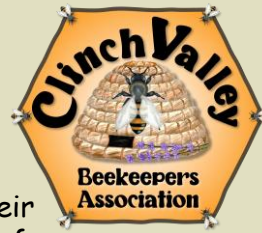
Figure 7: The foam sleeve slides over the boxes and rests on an added ledge at the junction between the bottom board and the lower box keeping everything at the right height.





BEEKEEPING HISTORY

Researched by
Sherri Hudson



CHRISTMAS FOLKLORE and TRADITIONS

In obedience to the general belief in the potency of Christmas night to bring good husbands to their daughters, mothers will besmear their faces with honey, accompanying this with certain formulas of words which must never vary. - Europe Lore

- Putting a few vánočka crumbs (Christmas bread) in front of the beehive will make sure that the bees will produce enough honey next year. -Checz Lore

- The Russian Slovak Christmas Eve dinner starts with the appearance of the first star in the sky.

The legs of the dinner table are tied with an iron chain to symbolize family togetherness. After lighting the beeswax candles and singing carols, the family prays over the meal. The mother makes a cross with honey on the forehead of each member of the family to protect against evil. Special waffles are eaten after being dipped in honey (bringing the goodness and health of the bees) and garlic (to frighten away the evils of illness).

All About the Folklore of Christmas Insects

Bees have a long history of symbolism in many cultures and religions throughout history. Throughout the centuries they have symbolized such virtues as wisdom, love, fidelity, industry and bringers of good luck and prosperity. In Celtic mythology, honeybees were regarded as messengers between our world and the spirit realm and were associated with wisdom garnered from the otherworld.

When Christianity first came to Britain, the folktales in Scotland and England took the bee as part of their own stories. It was stated that bees hummed loudly at midnight at the first Christmas for the birth of Jesus. In modern day, ornaments in the shape of a honeybee are hung on Christmas trees, as a symbol for good luck or prosperity to come.

Ancients, Bees and Winter

Read more to find out what the ancients have to say about winter and bees.

The Winter Solstice has been observed as an important date in beekeeping for over 2000 years.

- Aristotle says in *Historia Animalium* (History of Animals) Book IX circa. 4 B.C.

"In healthy swarms the progeny of the bees only cease from reproduction for about forty days after the winter solstice.

- "Pliny the Elder says in *Naturalis Historia* (Natural History) circa. 77 - 79 AD

"From the winter solstice to the rising of Arcturus the bees are buried in sleep for sixty days and live without any nourishment. Between the rising of Arcturus and the vernal equinox, they awake in the warmer climates, but even then, they still keep within the hives and have recourse to the provisions kept in reserve for this period."

- Virgil says in *Georgics*, Book IV circa. 29 B.C.E

"Contracto frigore pigrae."

"With cold benumbed, inactive they remain."

- In the book 'The Universal Magazine of Knowledge and Pleasure' circa. 1755

"The ancients mention a very extraordinary method of preserving the bees in their hives, which was by filling up a considerable part of the vacancy of every hive with the bodies of small birds, which had been killed, gutted, and dried for that purpose. This was certainly a way of keeping out some of the cold air, but it is so odd a one, that, probably, no-body since that time has tried it.

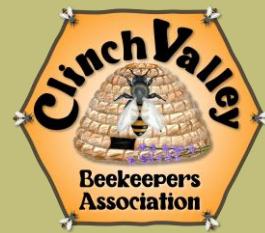
Original source unknown: perhaps Columella, Palladius or Pinly (the elder)





BEE INSIGHTS

Researched by
Sherri Hudson



10 FACTS ABOUT HONEY BEES!

Find out all about our brilliant bees!

Calling all budding - or should we say buzz-ing - young naturalists!

Join National Geographic Kids as we get the lowdown on one of our planet's most fascinating insects in our ten facts about honey bees!

Facts about honey bees

1. Honey bees are super-important pollinators for flowers, fruits and vegetables. This means that they help other plants grow! Bees transfer pollen between the male and female parts, allowing plants to grow seeds and fruit.



2. Honey bees live in hives (or colonies). The members of the hive are divided into three types:

Queen: One queen runs the whole hive. Her job is to lay the eggs that will spawn the hive's next generation of bees. The queen also produces chemicals that guide the behavior of the other bees.

Workers: these are all female, and their roles are to forage for food (pollen and nectar from flowers), build and protect the hive, clean and circulate air by beating their wings. Workers are the only bees most people ever see flying around outside the hive.

Drones: These are the male bees, and their purpose

is to mate with the new queen. Several hundred live in each hive during the spring and summer. But come winter, when the hive goes into survival mode, the drones are kicked out!

3. What are these *buzzing* bugs most famous for? Delicious **honey**! But did you know they produce honey as food stores for the hive during winter? Luckily for us, these efficient little workers produce 2-3 times more honey than they need, so we get to enjoy the tasty treat, too!

4. If the queen bee dies, workers will create a new queen by selecting a young larva (the newly hatched baby insects) and feeding it a special food called "**royal jelly**". This enables the larva to develop into a fertile queen.

5. Honey bees are fab flyers. They fly at a speed of around **25km per hour** and beat their wings **200 times per second**!

6. Each bee has **170 odorant receptors**, which means they have one serious sense of smell! They use this to communicate within the hive and to recognize different types of flowers when looking for food.

7. The average worker bee lives for just five to six weeks. During this time, she'll produce around a twelfth of a teaspoon of honey.

8. The queen can live up to five years. She is busiest in the summer months, when she can lay up to **2,500 eggs** a day!

9. Honey bees are also brilliant boogiers! To share information about the best food sources, they perform their '**waggle dance**'. When the worker returns to the hive, it moves in a figure-of-eight and waggles its body to indicate the direction of the food source. Cool, huh?

10. Sadly, over the past 15 years, colonies of bees have been disappearing, and the reason remains unknown. Referred to as 'colony collapse disorder', billions of honey bees across the world are leaving their hives, never to return. In some regions, up to 90% of bees have disappeared!

We can all do our bit to support these brilliant bugs, gang! Why not plant flowers rich in nectar, such as **lavender** and **bluebells**, which will help bees find the food they need?

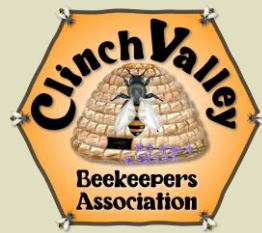
And when your family are buying honey, try to choose varieties that are **locally made**, to support our honey bees and their beekeepers!





THE HONEY HOUSE

Researched by
Sherri Hudson



THE BUZZ ABOUT HONEY

Is honey vegan? The short answer is no.

To understand why, let's examine what honey is and how it is made.

Honey is a gold- or amber-colored liquid used by humans mainly as a sweetener, though it can also be found in some cosmetics, medications, and alcoholic beverages. Bees make this viscous substance from nectar collected from flowers. For them, it is a source of nourishment.

It all begins with plants. Plants and insects have a collaborative relationship, and perhaps the most important element of that collaboration is how insects help certain plants reproduce. They do this through pollination, with many plants attracting winged insects to their flowers using sweet nectar, which contains sugars, vitamins, and additional nutrients that serve as a high-energy food source for insects such as bees. Along with nectar, flowers of these plants also contain pollen, grain-like particles that are another source of food for bees and are responsible for fertilizing a plant through that plant's ovary. (While nectar is vital for energy, pollen provides bees with protein, which is essential for the development of young bees.)



Honeybee colonies are a perfectly balanced collective, and every bee has a specific job. There is the queen bee, who is the dominant, adult bee and mother to the bees in the hive. There are the worker bees, who are all non-fertile females; they are the bees collecting nectar and pollen. Finally, there are the drones—male bees whose only job is to mate with the queen. Unlike the worker bees, they don't have stingers and thus cannot help defend the hive.

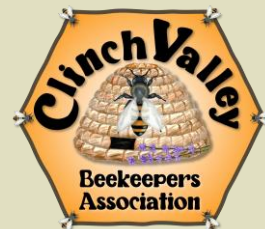
While the bee is busy within the flower collecting nectar, her body traps bits of pollen from one part of the plant and transfers some of it to the ovary of another plant, thus facilitating its reproductive cycle. In addition to

attracting insects with nectar, plants gradually evolved bright colors, and some developed scents and odors: flowers pollinated by bees and flies have a sweet scent, while flowers pollinated by beetles have musty or spicy odors.

A bee will suck the nectar and store it in her stomach. If she's hungry, she will consume the nectar she needs and then transport the rest back to the beehive, where other bees convert the nectar into honey by passing it, mouth-to-mouth, from one to another until the moisture content of the nectar has been reduced from about 70 percent to 20 percent. When ready, the honey is stored in cells within the hive (the honeycomb) and capped with beeswax in preparation for the birth of baby bees and for the winter months. The worker bees use the honey and pollen to make "bee bread," which is the colony's main source of food and is even fed to baby bees.

This is the way nature intended bees to live and thrive, but industrialized honey production is a different story. In the United States alone, honey is a nearly \$10-billion industry, so the companies that package and sell it have an enormous economic interest to protect.





Not-So-Sweet Reality

The honey industry shares several parallels with the dairy industry. For one thing, the honeybee (*Apis mellifera*) is not native to North America; just like cows, honeybees were brought to the U.S. centuries ago from Europe to serve as agricultural animals. In addition, both the dairy industry and the commercial honey industry are built upon models in which humans ultimately steal the animals' food source and replace it with an inferior and unnatural substitute. Like cows, honeybees are artificially inseminated. And, just as cows and calves are considered "expendable" in the dairy industry, so too are bees sometimes killed after they have outlived their usefulness: bee farms have been known to destroy entire colonies after harvesting because it's cheaper than feeding the bees throughout the winter.

Let's look closer at some of the troubling realities of the honey industry.

Bees are given artificial feeds.

As we've established, honey and pollen are foods for bees. Since most beekeepers want to profit from the honey, they feed the bees a substitute, usually sugar syrup or high-fructose corn syrup. These artificial foods have been found to harm the immune system of bees and cause genetic changes, ultimately diminishing their natural defenses against pesticides. Indeed, the practice of feeding bees high-fructose corn syrup has even been tied to the collapse of bee colonies around the world, since the substitute does not contain the enzyme, they need to help to fight off toxins. So, not only is honey the food nature intended for bees, but it contains vital protective properties meant to help bees survive.



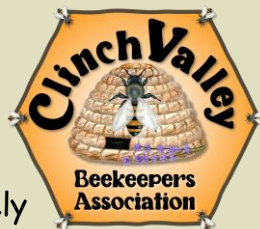
Bees are artificially inseminated.

In nature, queen bees select whom they mate with, usually 10 to 20 drones and copulate in flight. In the honeybee industry, semen is collected from mature drones who have been caught and stored in cages. After being selected, the drone's head is crushed, his abdomen is squeezed, and his semen is collected in a syringe. The queen is then immobilized in a chamber and knocked out with carbon dioxide gas and the semen from about 10 drones is forced into her. This procedure is meant to ensure honey farms are using the best "breeding stock." One company that specializes in providing queens even boasts: "We can make inseminated breeder queens to order, per your specifications."



Bees are intentionally killed. In addition to dying from weakened immune systems and drones being killed in the process of artificial insemination, bees used for honey may be killed in other ways. Hives are prone to disease, for example, and many beekeepers will simply "depopulate" an entire colony of bees by burning them alive in their hives. (Beekeeping literature actually recommends fire for the "euthanasia" of bees.) Meanwhile, honeybee farmers not wishing to go to the expense of maintaining hives throughout the winter often gas the colony with calcium cyanide.

Bees are accidentally killed. In the course of removing honeycomb and beehive components such as frames, beekeepers have been known to kill worker bees, unborn bees (known as bee brood), and even the queen. For beekeepers, it's just one of the consequences of doing business. "I kill brood all the time for my IPM," boasts one beekeeper. "I cut the tops off half of my drone brood during the spring and summer and yank their corpses right out."



Queen bees often have their wings clipped. As a queen bee ages, a new queen is born in the colony to replace her. At this point, the older queen will fly away to start a new colony—taking the bees with her. To prevent such “swarming,” beekeepers routinely clip one or both wings of the queen, thus preventing her from ever leaving. But many beekeepers argue that clipping the queen’s wings does not prevent the other bees from swarming.

A Sticky Position

So, why do some people who consider themselves vegan continue to eat honey? It could be because they don’t think of a bee as an animal. Or that they aren’t aware of where honey comes from. Some believe honey is simply a natural byproduct of crop pollination. Still others feel that avoiding honey is something only “extreme” vegans do.

These vegans may be surprised to learn that honey is sometimes even tested on other animals, including the use of rats to determine how honey affected their testosterone levels, the use of dogs who have been burned in a lab to see if honey helped heal their wounds, or using rabbits who underwent skin lacerations to evaluate the healing properties of three types of honey, along with many others.

Bee Smart

Although intelligence should never be a criterion for not harming or exploiting someone, it may help you understand bees better to know that they are not simply “mindless” drones and workers, forever making honey. Indeed, the whole point of their honey-making is that they are planning ahead, preparing for the winter months when nectar and pollen will not be available. Bees also have a basic grasp of the concept of zero—an understanding that reflects such high brain functioning that it was once thought only humans were capable of it. Bees experience emotions, as well—and store these experiences as memories. Scientists have even documented them using tools: honeybees in Vietnam were seen using animal feces to repel giant hornets. Moreover, bees have been observed learning tasks from their fellow bees and even improving upon what they’ve learned. “These are high, high, highly intelligent creatures,” says one biologist. “They use their neurons in their brain as efficiently as any other animal on the globe.”

And let’s not overlook how important bees are to our planet. Do you like flowers? You can thank bees for pollinating plants. Do you like eating fruits, nuts, and vegetables, including almonds, asparagus, avocados, broccoli, cherries, citrus fruit, cranberries, cucumbers, melons, and soybeans? Yep, bees again; in fact, about one-third of the food we eat comes from crops pollinated by honeybees. Animals in the wild benefit from the pollination efforts of bees, too. Bees are even partly responsible for the proliferation of the Earth’s trees that produce the oxygen we breathe and absorb CO₂! So, show them some love!

One final note to consider: A worker bee will live about one month and produce just a twelfth of a teaspoon of honey in her entire lifetime, which means that a single teaspoon of honey added to a cup of tea is actually the life’s work of 12 bees. Why steal their hard-earned sustenance when we have so many other options?

What You Can Do

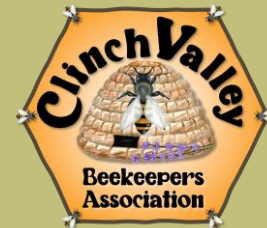
Bee kind! Plant a bee-friendly garden: If your home has enough outdoor space, create a bee-friendly garden to help these essential workers (as well as the drones and queens) thrive!





STUDIO PROJECT

Researched by
Sherri Hudson



BEESWAX:

USES for NATURE'S MOST VERSATILE PRODUCT

by: Elsa Scott of Best Bees

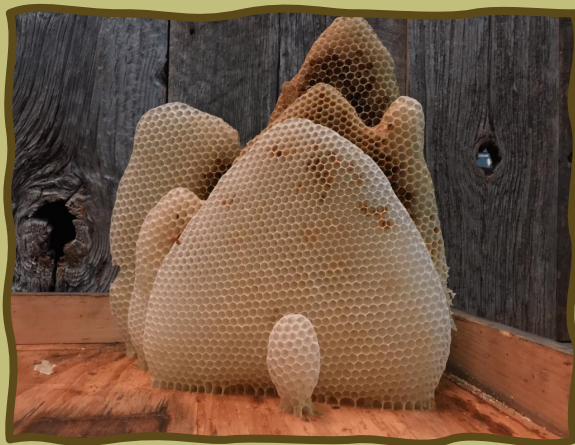
What is Beeswax?

Beeswax is a waxy substance created by young honey worker bees. In beehives, beeswax is used by worker bees to create cells. The hexagonal design of these cells creates the iconic "honeycomb" pattern..

Chemically, beeswax is composed of over 280 different compounds, primarily monoesters (45-55%), hydrocarbons (15-18%), free fatty acids (10-15%), diesters & complex esters (8-12%), hydroxy monoesters (4-6%), and free fatty alcohols (1-2%). Exact composition can vary by bee type, location and conditions.

We pioneered the process of identifying the exact percentage of various pollen species found in honey through advanced genomic sequencing.

Beeswax is not water soluble. It has a relatively low melting point—around 60-65 degrees centigrade, making it easy to work with. The chemical composition of beeswax makes it both a structuring and plasticizing agent — meaning it can thicken solutions and thin others, depending on what it is combined with; this dual functionality makes it a highly effective agent in cosmetics, where both qualities are in demand.



How is Beeswax Produced?

Young worker bees are fed copious amounts of honey inside the hive, and their bodies digest the honey, using the nutrients to form wax which is secreting in thin scales from wax glands in their abdomens.

The wax scales are gathered by other worker bees, who chew it to soften it, making it pliable enough to be formed into cell walls. Through this process, bee colonies create the comb in which they raise new bees, transform pollen into "bee bread," and store honey.

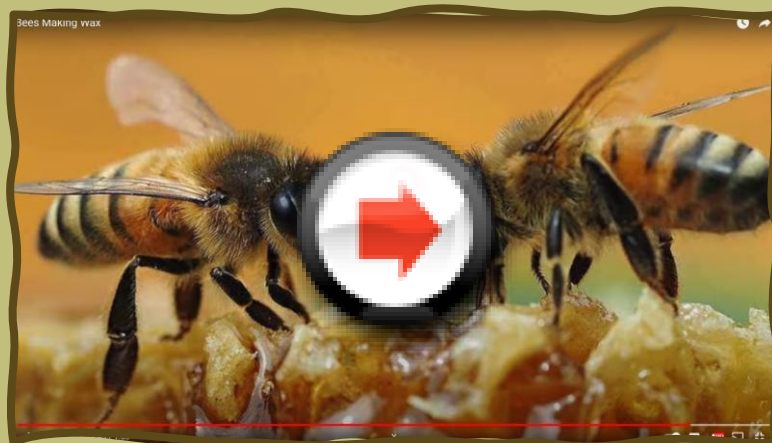
Characteristics of Beeswax

When beeswax is first created, it's a soft, white, malleable substance. Once formed into cells, it becomes harder, in order to form stable cell walls. Over time, the presence of propolis, pollen and honey in cells changes the color of beeswax. The longer wax is inside a hive, the darker it becomes, from white to a pale gold to amber to brown. Wax from brood cells is the darkest because of the pupal cocoons left in the cells. Different kinds of nectar produce different colors of honey, and these affect the color of beeswax as well.

In processing beeswax, beekeepers filter melted wax, removing impurities, and lightening the color.

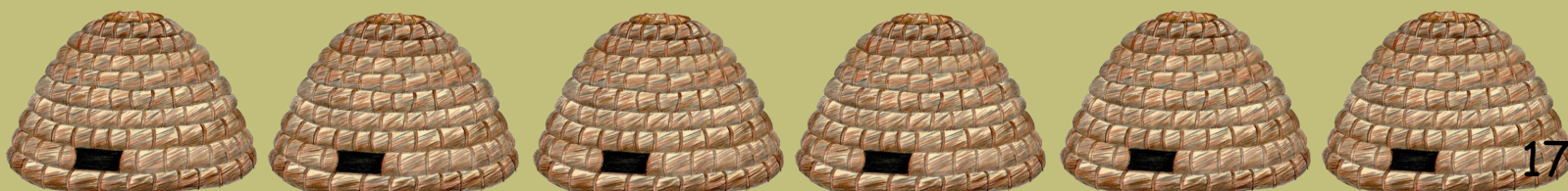
Commercial beeswax manufactures may even bleach it to return it to its original white color.

Beeswax fresh from the hive can smell like a subtle mix of honey, floral spices & resins, and the wood of the bee box and frames. Both the scent and color of beeswax can vary between seasons and hives due to the pollen, resins, nectar, and honey that the wax comes in contact with. Just like how the taste of honey can change depending on the pollen collected by the bees, the same effect happens to the beeswax.



Bees Making Wax

Sydney Bee Club Inc





Properties of Beeswax

Beeswax is a natural, organic substance that is malleable, chemically soluble, water insoluble, edible and flammable. As a malleable substance it can be molded into different



shapes to make a variety of useful and decorative things.

Because of its malleability, it's sometimes called "the world's first plastic."

As a soluble substance, it can be melted and mixed with other substances to create many different health & beauty and home care products.

As a water insoluble substance, it can be used to seal joints and waterproof surfaces.

As an edible substance, it can be eaten, and while not digestible, it can provide roughage and some beneficial chemicals to the human system.

As a flammable substance, beeswax can be used to make candles that burn cleaner and brighter than paraffin candles.

Benefits of Beeswax

Beeswax has a multitude of natural benefits, and although it is edible, beeswax is most commonly added to everyday personal care routines. A few advantages to using beeswax include:

- **Moisturizing Components:** Beeswax locks in moisture and can help keep the skin firm and plump. The anti-allergenic and anti-inflammatory properties soothe easily irritated skin, making it one of the best skincare ingredients for healing rosacea or eczema.
- **Ability to Protect from Irritants:** Beeswax can also act as a layer of protection when applied to the skin. It can protect the skin from environmental irritants and extreme weather.
- **Promotion of Hair Growth:** Beeswax not only moisturizes and soothes hair, but it can keep natural moisture from getting out of the hair. It also stimulates hair growth and reduces hair loss.

Historical Uses

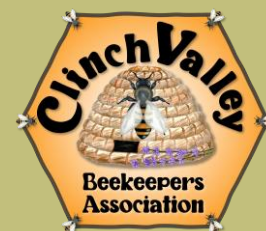
The first identified use of beeswax was to fill a cavity in 6500+ year-old tooth discovered by archeologist in Europe. Other ancient uses of beeswax were as an ingredient in nail polish and in medicine in early China (c. 2500 BCE), and as a haircare product, painting medium, and ingredient in embalming mummies in Egypt. Beeswax has been found on clay pots from the 5th millennium BCE—no doubt used as sealant to make the pots waterproof. Greeks and Romans mixed beeswax with olive oil and herbs to create salves to treat sores, cuts and burns, and as cosmetic creams to moisturize skin.

From the dawn of writing, beeswax has been used to seal documents and letters. With the invention of metal casting, beeswax has been used in a process known as the "lost wax method" to create bronze statues and gold and silver jewelry.

Beeswax candles have been found in early Egyptian tombs and were used by the wealthy throughout the Mediterranean during the classical period (poor people used cheaper oil lamps).

Beeswax candles became popular in Christian churches in the Middle Ages, as they burned bright and gave off little smoke.





Common Uses of Beeswax Today

Beeswax is an incredibly versatile substance — it can be mixed into solutions to create a host of medical, cosmetic and home care products, made into candles, eaten, melted and molded into ornaments and used as a sealant.

These are just 50 of the many ways you can use beeswax and products made with beeswax to improve your life:

- Lubricate door hinges
- Make all-natural lipstick
- Season cast iron pans
- Coat garden tools to prevent rust
- Polish shoes with a solution of beeswax, olive oil and pigment
- Decorate your Christmas tree with molded wax ornaments
- Light your dinner table with smokeless beeswax candles
- Polish furniture with a solution of olive oil, beeswax, and lemon oil
- Condition cutting boards and wooden spoons
- Refill tealights with beeswax
- Mix with pigments to make encaustic paint
- Lubricate screws to make them easier to screw in
- Heal cuts with a salve made of olive & coconut oils, beeswax, vitamin E and calendula, lavender, and chamomile
- Make fire starters out of pinecones and beeswax
- Keep bronze and brass items shiny
- Tame flyaway hair
- Fill cracks in wood
- Rejuvenate old leather
- Coat cloth to make reusable wrap for cheese and vegetables
- Coat nails to prevent wood splintering
- Make lip balm out of shea butter, beeswax and coconut oil
- Soothe bug bites with a solution of tea tree oil, lavender, beeswax, and calendula oil
- Soften cracked skin on feet
- Seal jars of preserves, jams and pickles
- Polish granite countertops
- Keep snow from sticking to snow shovels
- Mix with sugar and fruit flavorings to make gummy candies
- Style your hair with a natural alternative to gels and pomades
- Polish and preserve copper pots & pans
- Make kid-safe, non-toxic modeling clay
- Apply as an acne treatment
- Create solid perfumes using beeswax, almond oil, essential oils, and dried flowers
- Make craft soaps out of olive, coconut, castor & palm oils, beeswax, honey, lye, and essential oils
- Treat eczema and psoriasis with a solution of beeswax, honey and olive oil
- Eat it to help lower your cholesterol
- Put it on your pets' feet to protect them from wear
- Lubricate musical instrument strings and reeds
- Make wooden drawers slide smoothly
- Condition unfinished furniture
- Waterproof shoes and boots
- Make body butter out of coconut oil, shea butter, and beeswax
- Preserve cheese with a thin coating of beeswax
- Soften and style beards and mustaches
- Apply a coating to snowboards, skis and surfboards to improve their glide
- Wax flyfishing line to help it float
- Coat baking pans and cookie sheets to make them non-stick
- Make crayons out of cocoa butter, carnauba wax, beeswax, and pigments
- Treat diaper rash with a solution of honey, olive oil, and beeswax
- Wax thread to prevent tangles while sewing
- Chew it instead of gum

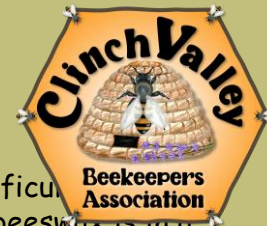




STUDIO PROJECT

CONT.

Beeswax - Uses for Nature's
Most Versatile Product



How to Melt Beeswax

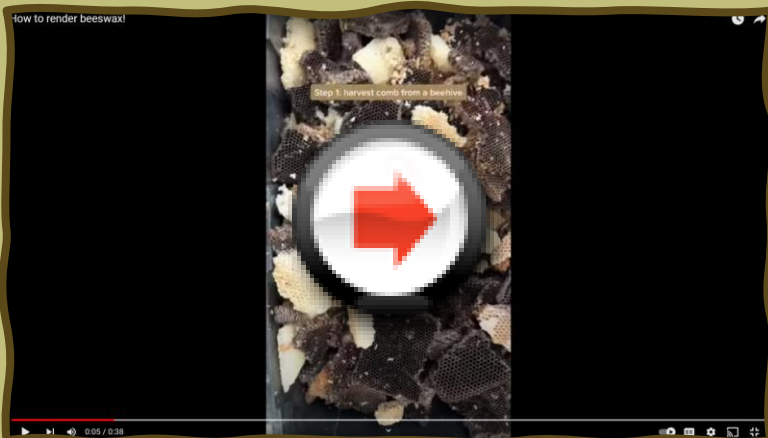
Many home uses for beeswax require melting it. Because beeswax adheres to surfaces and is difficult to remove — one reason why it's such an effective waterproofing agent — the best way to melt beeswax is in a disposable metal can. To melt beeswax at home, you'll need only a deep pan, a clean can, a block of beeswax, water, metal spoon and a heat source.

- **Step 1:**
Thoroughly clean and rinse a large metal can, such as a 32 oz. can you might have left over from stock or tomato sauce.
- **Step 2:**
Place the can in a deep pot and fill the pot with hot water halfway. Shave slices of beeswax into the can.
- **Step 3:**
Set heat to medium and bring water to a low boil, stirring the beeswax with a metal spoon until it melted.
- **Step 4:**
If coloring wax, add pigment and stir to blend thoroughly.
- **Step 5:**
Turn off heat and pour melted wax into solution or mold.



If you are developing your own commercial products to sell, be sure that you are purchasing as close to organic beeswax as possible. In order to be certified organic, chemicals cannot be used on land within 3 miles of the beehive. Even then, we know that bees travel up to 7 miles to find food and water and may even fly as far as 9 miles if resources are limited. It is worth the time to research your source to create the highest quality and healthiest products even for you and your family.

The following recipes are all by present and former members of Clinch Valley Beekeepers Association and can be found in their recipe book "**Recipes from the Hive**"



How to Render Beeswax!

Happy Beekeeping



Benefits of Using Organic Beeswax

EcoMastery Project

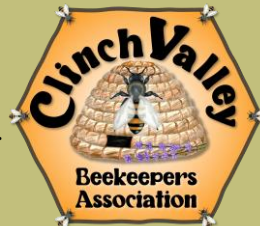




STUDIO PROJECT

CONT.

Beeswax - Uses for Nature's
Most Versatile Product



The following are recipes for using beeswax that are found in the CVBA "Recipes from the Hive". All recipes are from former and present members of the club. Check out more beeswax recipes in "Recipes from the Hive".

1. BALMS

Honey Butter Lip Balm

- 2 teaspoons olive oil
- $\frac{1}{2}$ teaspoon honey
- $\frac{1}{2}$ teaspoon grated beeswax or beeswax pellets
- flavored oil to taste
- 1 vitamin E capsule
- $\frac{1}{2}$ teaspoon Shea butter or cocoa butter

1. Melt the oil, honey, wax and butter over low heat.
2. Allow a few minutes to cook, then add flavoring and contents of the vitamin E capsule.
3. Stir to blend, then pour into containers.

If you would like a firmer balm, add a little more wax to ingredients.

Steve & Joyce Parks

3. HAIR CARE

Beeswax Hair Remover

- 2-4 tablespoons clean beeswax
- pot of boiling water

To make your own beeswax hair removal mixture,

1. Take a couple of teaspoons of beeswax and place in a double boiler or a bowl straddling a pot of boiling water. (You may need a little more if you're planning to wax a significant amount of hair.)
2. Let it fully melt before removing from the heat.
3. Applying liquid wax to your skin could result in a nasty burn, so wait until the beeswax begins to solidify before doing so.
4. Test a small amount on the inside of your wrist. If it still feels too hot, wait a little longer.
5. When it's reached the perfect temperature, lay it on thick to the desired area with a waxing stick. Apply in the direction of hair growth.
6. Wait until it cools and hardens before grabbing a corner and pulling it off. Do this in the opposite direction to your hair growth.
7. Afterwards, soothe skin by applying moisturizer.

Sherri Hudson

2. SALVES

Vapor Rub

- 1 cup coconut oil
- 20 drops peppermint oil
- $\frac{1}{3}$ cup beeswax
- 10 drops rosemary oil
- 25 drops eucalyptus oil
- 10 drops lavender.

1. Over low heat, melt coconut oil and beeswax together.
2. Remove from heat and add oils.
3. Mix, and pour into low sided jars.
4. Will harden. I like this firmness. Also, good this way for chapped hands and lips. By adding less beeswax, you can make it softer.

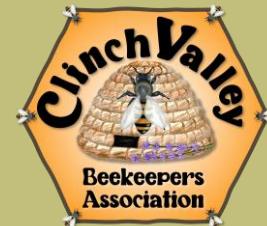


How to Make Beeswax Lip Balm

Sager Family Farm



Beeswax
candles & scented melts
by member Fay Kleppinger



4. SKIN CARE

Lotion Bar

- 1.5 oz. beeswax
- 1.5 oz. Shea butter
- 1 oz. regular, or white cocoa
- 2 oz. sweet almond oil butter
- $\frac{1}{4}$ teaspoon vitamin E acetate

Melt and mix well and pour into any container.
I poured into some old tin Jello molds, and bars are kind of cute.

They popped right out of the molds.

Debbie Clayton



Skin Cream

- 2.5 oz. beeswax
- 5 drops vitamin E oil
- 8 oz. (1 cup) olive oil
- 5 drops Tea Tree oil
- $\frac{2}{3}$ cup distilled water
- 15 drops essential oil of your choice
- 1 teaspoon borax

1. Heat olive oil and beeswax together until beeswax is melted and temperature has reached 125°-130°.
2. In a separate container, heat distilled water and borax to same temperature first mixture.
3. Slowly combine the two mixtures, mixing with a wire whisk as you pour.
4. When cooled down a little, add vitamin E, Tea Tree, and other essential oil and stir.
5. Pour into jars.
6. Allow to cool.

Debbie Clayton



5. NAIL CARE

Cuticle and Nail Butter

- 2 tablespoons Jojoba oil 10 drops lavender essential oil
- 1 tablespoon Shea butter vitamin E oil
- 1 tablespoon beeswax ($\frac{1}{2}$ oz.)

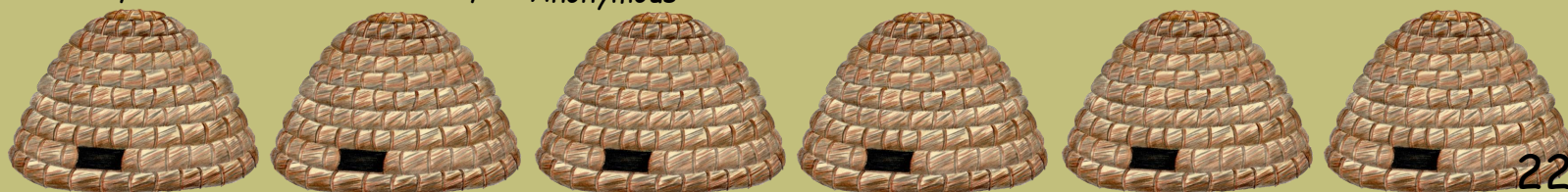
1. Combine Jojoba oil, Shea butter and beeswax in a small pot.
2. Warm gently over very low heat until Shea butter and beeswax melt.
3. Remove from heat.
4. Stir in lavender essential oil and vitamin E oil.
5. Pour mixture into a small, wide mouth glass jar and cool completely before covering.
6. Rub a small amount of this protective butter into your cuticles and nails daily.

Anonymous



Homemade Beeswax Hand Lotion/Cream & Body Butter Recipe

LDSPrepper





STUDIO PROJECT

CONT.

6. CRAYONS

Beeswax Crayons

Equipment Needed

- double boiler
- grater
- Pyrex glass measuring cup
- aluminum foil
- cookie cutters
- knife



Making of crayons is very easy and fun too. These are kids friendly, and it is far better when compared to Soy crayons. The texture of beeswax crayons is very smooth, and the fragrance is great. You can add your favorite fragrance by adding Essential oils in them.

Making Crayons

- cooking oil
- food colors - paste, gel, or powder. Do not use liquid form, it won't mix with the wax (like and water). I like to use powered tempera paint.
- 90 g (approx. $2\frac{1}{4}$ cups) of clean, pure beeswax
- 90 g (approx. $2\frac{1}{4}$ cups) of soap oil (preferably in white color)

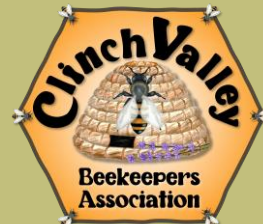
1. Place the cookie cutters on the aluminum foil sheet and cut the sheet according to the size of the cookie cutter.
2. Fold the edges of the sheets to the top of the cookie cutter (without tearing the sheet).
3. Grease the cookie cutter mold with cooking oil.
4. Grate the beeswax and soap. Then place both in the glass measuring cup.
5. Heat water in large pan or double boiler, place the measuring cup resting inside. Gently, melt & mix the beeswax and soap over low heat until the mixture is smooth.
6. Add the food-coloring paste and stir thoroughly to combine (I use a chopstick for stirring.)
7. Start pouring the mixture into the molds.
8. Let them sit for 4 hours.
9. After the resting time, remove the crayons from the mold.

Note:

- When you mix the food color, do it carefully. The wax will be very hot.
- The crayon(s) may be melted again after testing if more coloring is required.

Sherri Hudson

Beeswax - Uses for Nature's Most Versatile Product



7. HOUSEHOLD

Easy Beeswax

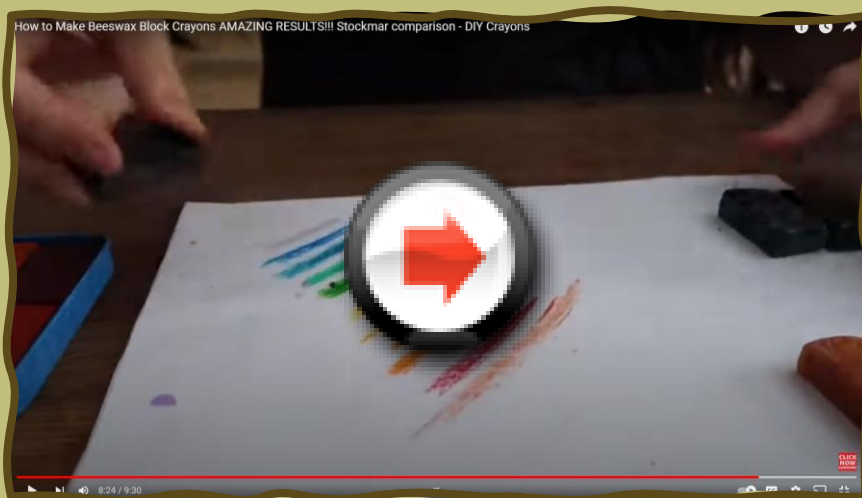
Hardwood Furniture Polish

- $\frac{2}{3}$ cup mineral oil
- $\frac{1}{3}$ cup beeswax

Bobbi Smith

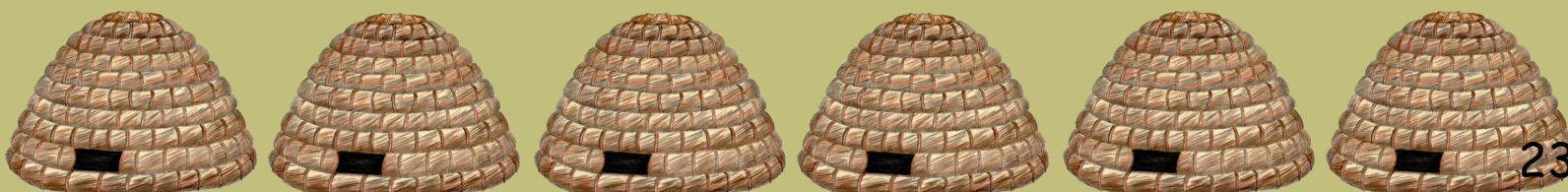
1. Melt enough beeswax in a double boiler (do not melt over direct flame -- risk of fire) so that you can pour out $\frac{1}{2}$ cup of melted wax.
2. Add $\frac{1}{2}$ cup mineral oil.
3. Stir beeswax and oil together.
4. Pour into an 8 oz. jar and allow to harden.

Great for hardwood furniture.
Not for plastics, vinyl, etc.



How to Make Beeswax Block Crayons

Large Family Mama





HONEYBEE LUNCH

Researched by
Sherri Hudson



COMMON YARROW

Common yarrow (*Achillea millefolium*, perennial): The bright, flattened heads of common yarrow are covered with tiny daisy flowers that bees really favor. Native to both Eurasia and North America, this plant attracts loads of pollinators no matter where it's planted. There are many beautiful varieties for the garden; two of the better variants are the rich red 'Strawberry Seduction' which has pink flowers

Flower Color:

- White

Flowering Season:

- Summer

Flowering Months:

- June •July •August



and 'Wonderful Wampee' that fade too nearly white.

Moisture Conditions:

- Dry •Moderate •Moist

Light Preference:

- Full Sun •Part Shade

Soil Preference:

- Clay •Loam •Sand



Gardening Notes:

Seeds and/or plants are typically available from greenhouses and seed supply companies specializing in native plants. This plant can be grown from seeds, and care should be taken to control its weedy tendencies.

Physical Appearance:

Common Yarrow is a perennial with one to several hairy stems that grow to 100 cm tall from an underground rhizome. Its alternate, lance-shaped leaves are hairy and twice divided into fine leaflets, giving them a feathery appearance. Multiple flower heads are arranged into flat, dome-shaped clusters on flowering branches. Each head is made up of five ray (often with notched tips) and 5-to-25-disc florets. The single-seeded fruits are oblong, flattened, and lack tufts of hair.





HONEYBEE LUNCH

CONT.

Common Yarrow



History, uses and notes:

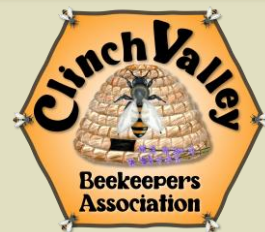
Yarrow has a great and fascinating history. The Latin name - *Achillea millefolium* comes partly from Achilles, the mythological Greek warrior who it is said used Yarrow to treat his wounds and those of his fellow warriors. The millefolium is a representation of its many flowers. The bees love the open accessible pollen that these broad flat flowers give access to. Bees aren't the only ones to love it, some species of bird have been known to line their nests with Yarrow. It has been suggested this may help prevent the growth of parasites.

Common Yarrow is widespread throughout North America and has been used by Indigenous people for medicinal purposes. It is often found in gardens, but spreads from a rhizome and can become weedy. Its flowers have a distinctive smell and provide nectar and pollen that is especially attractive to butterflies, wasps, flies, and bees. The leaves have a bitter taste, and most mammals find them an unappealing meal.



POLLINATORS GARDEN

Researched by
Sherri Hudson



Five Native Tennessee Plants that Attract Pollinators to Your Yard

[Tennessee Aquarium \(tnaqua.org\)](http://Tennessee Aquarium (tnaqua.org))

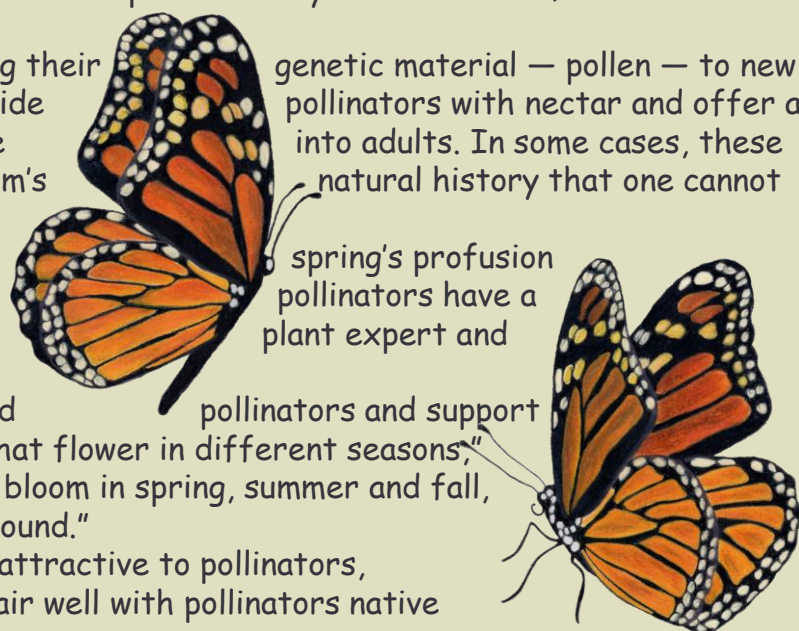
If you want to entice native pollinators like Monarch Butterflies to your area, using native plants is key. Many plants and pollinators share symbiotic relationships that have developed after generations of living side-by-side in the same geographic regions. These natural partners rely on each other for necessities like food, shelter and reproduction.

Native pollinators help plants reproduce by carrying their places while visiting flowers. In return, plants provide safe place to lay their eggs or for larvae to mature. Relationships can become so crucial to each organism's survive without the other.

People often think of pollination in the context of of blooms and animal births, but plants and year-round relationship, says Jenna Paler, a native Plaza Maintenance Supervisor at the Aquarium.

"One of the most important things you can do to aid their migration and life cycles is to plant species that flower in different seasons," Paler says. "This combination includes species that bloom in spring, summer and fall, making them ideal for attracting pollinators year-round."

If you're looking for ways to make your yard more attractive to pollinators, here are five species Paler suggest planting that pair well with pollinators native to East Tennessee and the surrounding region.

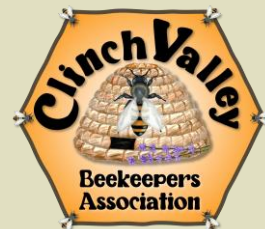


genetic material — pollen — to new pollinators with nectar and offer a into adults. In some cases, these natural history that one cannot

spring's profusion pollinators have a plant expert and

pollinators and support





Eastern Red Columbine

(*Aquilegia canadensis*)

A perennial herb, Eastern Red Columbine blooms in the early spring. Also called Wild Columbine, it forms dense patches with tall, wiry stems that produce drooping, red and yellow flowers with a bell shape.

The only species of columbine native to eastern North America, it is often pollinated by hummingbirds and long-tongued insects. Eastern Red Columbine is moisture-tolerant and shade-loving.



Milkweed (*Asclepias* spp.)

Milkweed is a perennial often associated with Monarch Butterflies, which lay their eggs solely on these plants. Milkweed blooms in summer, and there are approximately 140 species of milkweed. Milkweed leaves, stems and blossoms are poisonous, but not to Monarchs. Monarch caterpillars will exclusively consume the milkweed plant, absorbing its toxicity as a defense against predators until the caterpillars are ready to pupate. Milkweed requires moderately dry and well-draining soil and full sunlight.



Purple Coneflower (*Echinacea purpurea*)

Purple Coneflowers are a perennial herb that has long been used in traditional medicine. Growing as large as 4 feet tall, their flowers are made up of narrow, purple petals surrounding an orange center cone.

Purple Coneflowers bloom in early summer. Flowering is best in full sun, but they can tolerate partial shade.



Joe-Pye Weed (*Eupatorium fistulosum* or *purpureum*)

Joe-Pye Weed, also called Trumpetweed, is a perennial that can grow up to 7 feet tall. Blooming in mid to late summer, it produces enormous flowering heads with tiny pink or purple blossoms that are attractive to many pollinator species, especially honeybees. Joe-Pye Weed prefers moist soil and full sunlight to thrive.



Ashy Sunflower (*Helianthus mollis*)

Ashy Sunflowers, also known as Downy Sunflowers, are a perennial that produces a multitude of brilliant yellow flowers each about four inches wide. Growing from 2 to 6 feet tall, their leaves and stems are covered in coarse hairs.

These flowers are popular with pollinators like bees and butterflies seeking nectar late in the season after other plants' blossoms have wilted.

Ashy Sunflowers bloom in late summer through fall. This plant does best in well-draining soil in full sun, but it is tolerant of partial sunlight.





RECIPES from the HIVE

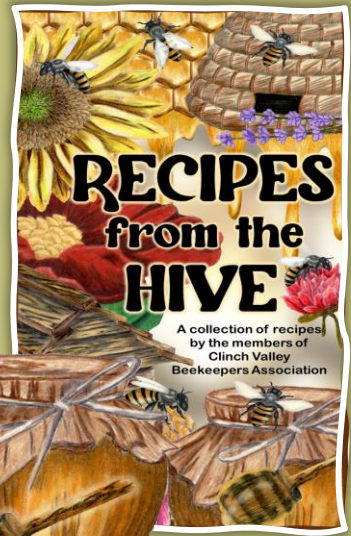
CURRIED CHICKEN WINGS

- 1 cup honey
- 4 teaspoons curry powder
- 2 $\frac{1}{3}$ cup Dijon mustard
- 2 $\frac{1}{2}$ lbs. chicken wings
- 2 tablespoons butter



1. In a small saucepan, combine honey, mustard, butter and curry powder.
2. Cook and stir over medium heat until blended.
3. Arrange chicken in a 13"x9" baking dish.
4. Drizzle with honey mixture.
5. Cover with foil and bake at 350° for 30 minutes.
6. Remove foil and bake 30 minutes longer, turning after 15 minutes.

from former member
Rebecca Goble
page 2



FRUIT SALSAS

Summer Salsa:

- 1-pint fresh strawberries, rinsed,
 - 2 tablespoons lemon or lime juice hulled and finely chopped
 - 2 tablespoons honey
 - 2 medium pears, quartered, cored and finely chopped
1. Place finely chopped fruit in a storage container and add remaining ingredients.
 2. Stir well.
 3. Place plastic wrap directly on top of salsa to prevent browning, then cover with lid.
 4. Store in refrigerator up to 5 days.
- Makes 2 cups.



from member
Lynda Eskola
Page 12

Winter Salsa:

- 2 medium pears, quartered, cored
 - $\frac{1}{4}$ cup raisins and finely chopped
 - $\frac{1}{4}$ cup orange juice
 - 1 cup cranberries, finely chopped
 - 2 tablespoons honey
1. Mix all ingredients in a storage container.
 2. Cover tight and refrigerate up to 1 week.
- Makes 2 cups.

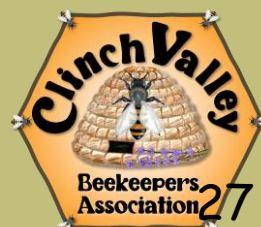
HONEY MUSTARD TURKEY SALAD

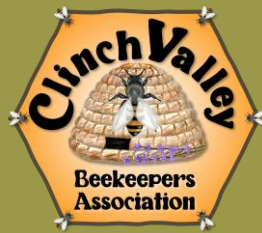
- 2 cups cooked, chopped turkey
- 2 tablespoons honey
- 6 slices cooked bacon
- 1 $\frac{1}{2}$ tablespoons Dijon mustard
- 1 jar mushrooms, drained
- $\frac{3}{4}$ teaspoon soy sauce
- $\frac{1}{4}$ cup sweet red pepper strips
- $\frac{3}{4}$ teaspoon lemon juice
- $\frac{1}{4}$ cup sliced green onions
- 2 oz. pkg. roasted cashews
- $\frac{1}{2}$ cup mayonnaise

1. Combine turkey, bacon, mushrooms, red pepper strips and green onions in a bowl.
2. In another bowl, combine remaining ingredients.
3. Mix well.
4. Combine dressing mixture with turkey and vegetable mixture.
5. Chill before serving.



from member
Teresa Lamb
Page 36





Telling the Bees

Shannon Amidon

Encaustic artwork on wood.

As an encaustic artist, Shannon Amidon is keenly attuned to the bond between art and nature; honeybees produce the wax she uses for her encaustic paint. My artwork places a particular focus on the decline of pollinators and other insects due to the loss and destruction of their habitats, she explains. This layered mixed media painting contains larger than life honeybees, 24k gold leaf hexagons and a variety of vintage ephemeral materials collaged beneath the surface, including old book pages, maps and letters.

Shannon Amidon is an artist based in Portland, Oregon whose artwork is made with encaustic (molten beeswax) and collaged vintage paper. She uses materials that evoke a sense of nostalgia, such as old letters, maps, book pages, and report cards, which she finds at antique stores or estate sales.

By repurposing ephemeral materials, she gives each piece a history beyond itself, and adds to the personal nature of the art. She also makes her own eco-friendly encaustic and oils. "The environment is very important to me, so I use natural earth pigments," says Shannon. Her love of nature comes across in the motifs she selects, hinting at both the wonder and delicacy of the cycle of life.

BOOKSHELF

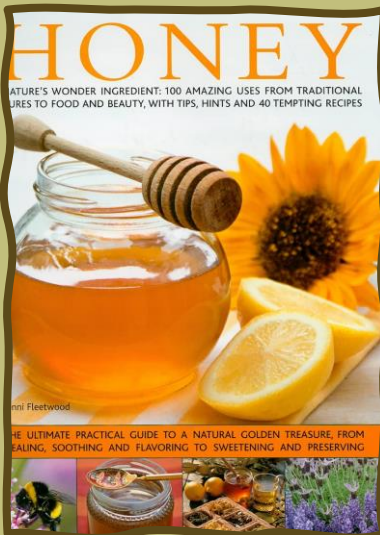
The Book of Honey:
Nature's wonder ingredient:
100 amazing and unexpected uses
from natural healing to beauty.

May 16, 2009

by Jenni Fleetwood (Author)

Honey was the first sweetener, predating sugar by hundreds of years. But as well as its noted culinary uses, honey has long been valued in folk remedies for its unique properties.

This new book presents in one special volume not only a fascinating history of honey, but also, a practical guide to it's uses.



BEE QUOTE

"Life is the flower for
which love is the honey."

Victor Hugo

POETS STAGE

The Tax-Gatherer

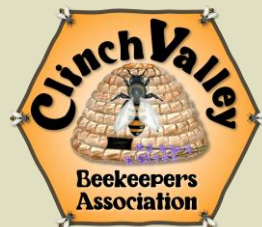
by John B. Tabb

"And pray, who are you?"
Said the violet blue
To the Bee, with surprise
At his wonderful size,
In her eye-glass of dew.
"I, madam," quoth he,
"Am a publican Bee,
Collecting the tax
On honey and wax.
Have you nothing for me?"



KIDS CORNER

Researched by
Sherri Hudson



The very greedy bee is so full that he cannot fly! It's getting dark and he doesn't know how to get home unless he flies. With the help of some newfound friends the very greedy bee is able to return to his hive and has learned that it's best to work with others and share what you have.

The Very Greedy Bee with sounds and animation - YouTube

MINE! That's what the very greed bee says to anyone who asks him to share. While all the other bees work hard to clean the hive and make honey, the very greedy bee spends all of his time gobbling pollen and guzzling nectar. One day he finds a meadow full of flowers and decides not to tell anyone. He spends the entire day buzzing from flower to flower until....

Summary:

Busy! Every bee is busy. While everyone else is making honey for the hive, the Greedy Bee is busy drinking all the nectar and keeping it for himself. When he discovers a new field of flowers, he decides to keep his new source of pollen a secret. He spends the whole day drinking nectar ... and then is too heavy to fly. It's getting dark and the Greedy Bee is getting scared. How will he get home? With the help of some friendly insects, Greedy Bee learns a valuable lesson.

Reader Enjoyment Factors:

Bright colorful illustrations and a simply-told story engage children in this story with a life lesson about friendship, selfishness, and ultimately happiness.

Little Kid Reaction

The minute she spotted this in the pile, our daughter pulled it out, headed to the family room, and started reading. She wanted us to read it again at bedtime, too.

Big Kid Reaction

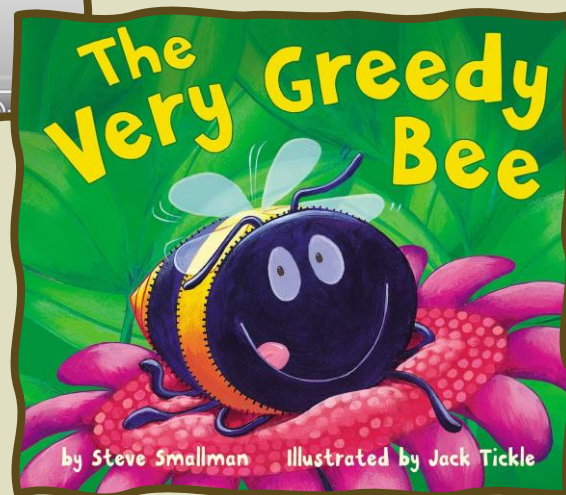
This is a fun story. The illustrations are colorful, the varied text size add emphasis to the sounds, and the story has a good message. For some kids, the Greedy Bee's leap from selfish to selfless may seem pretty quick or out of context since none of the other insects witnessed his meanness.

Type of Book:

There are lessons about caring, change, and growing up in this picture book story that can also be an easy reader.

Educational Themes:

There are lots of things you can do with this book. There are themes of teamwork, responsibility (being a member of the hive), selfishness, acceptance, friendship, gluttony, and unconditional love, to name a few. This is a good book for showing kids that true happiness comes from giving.



The Very Greedy Bee

Picture Book, March 2, 2010

by Steve Smallman (Author), Jack Tickle (Illustrator)

Reading Level:

1.8

Recommended Age To Read By Yourself:

6 to 9

Recommended Age To Read Together:

4 to 8

Age of child:

Read with and by an 8-year-old girl.

Purchase Recommendation:

Buy. This is a book that will be fun to share with your toddler and important to keep handy in preschool when kids need a gentle reminder.

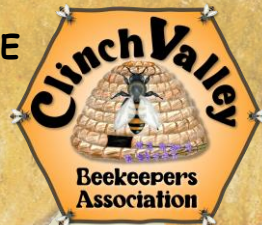


BEE MARKETPLACE

Advertise your honey, beeswax candles, honey soaps, salves, hive equipment, etc.

Send me the info along with a photo and contact info.

This feature is available **FREE** to any CVBA member who has honeybee products to sell/trade/give away.



CVBA Club T-Shirt

100% cotton Jerseys T-Shirt.

Variety of colors

S, M, L, XL sizes - \$12

XXL and larger sizes - \$15



Available at regular meetings.

"Honeybee World"

8 original watercolor pencil art note cards/envelopes by:

Sherri Hudson

On the back of each card, you will find a fact about honeybees.

\$20 per set + \$5 shipping/handling

Send check to:

Sherri Hudson

124 Shortt Road

Treadway, TN 37881

Available

at

Regular

meetings.



These are a few of the gift boxes that I will be selling at the Shop Small Holiday Market. You can also make your own gift box product choices.



Recipes from the Hive

Take home a treasured collection of recipes from many outstanding beekeepers, cooks, and crafters.

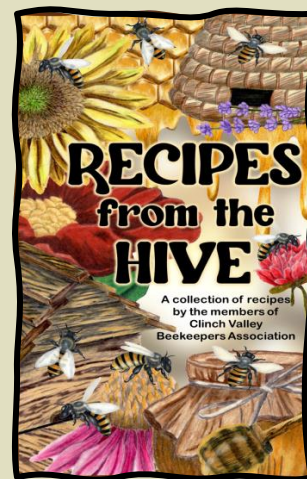
This attractive book makes an ideal gift or keepsake!

\$10 each to members

\$13 each non-members

Shipping \$5

Available at regular meetings.



Bee Equipment

The club has a full line of bee equipment for sale.
** See Jr for an inventory and price list.

Available at regular meetings.



BOARD MEMBERS

and OFFICERS

President

Lloyd "Jr" Snelson
432-626-5538
Cell 423-526-7742

Vice President

David Sams
423-693-6846

Secretary

Sherri Hudson
423-921-3140
(NO text messages)

Treasurer

Lynda Eskola
423-733-2017

Librarian

Karen Turner

Board Members

Tim Andrews
423-272-5492
Bobbi Smith
865-360-7373



CLUB ADDRESS

Clinch Valley Beekeepers

Lloyd "Jr." Snelson
PO Box 736
Sneedville, TN 37869



CVBA BEE INSPECTORS

Hancock & Claiborne Counties

Lloyd "Jr" Snelson
423-626-5538
cell 423-526-7742
Bill & Debbie Clayton
423-626-8786
cell 865-310-2421



ANSWER to BEE FUNNY

It has hives.



MENTORING

We encourage everyone to have a mentor, especially if you are new to beekeeping. If you need a mentor, please let Jr. Snelson or David Sams know at the next meeting, and they will try to find one. Please consider being a mentor for our club! See the secretary to be put on the list



LIBRARY

CVBA encourages each person to further their education by reading books, checking out various websites, and watching the videos that are available on bees and beekeeping.

Check out the selection of books and DVDs we have available.

If you have a book or video checked out, please return it at the next meeting.

Books can be returned to the Club Librarian, President, or Secretary.

If you have an idea for a book or DVD you think would be good for our library let us know.



REMINDERS

Tennessee law requires all colonies to be registered with the state.

Use the links below or the QR code to register your apiaries.

Online Apiary Registration Form:

[Apiary Registration](#)

Online request form for hive inspection:

[Apiary Inspection Request](#)



MEMBERSHIP

Renewal Dues become payable January 1st of each year. Dues are not pro-rated.

Single membership \$10

Family (one vote per family) \$15

Youth Single (No vote) \$5

See a CVBA officer to complete a new membership form or click here to download a form.

Checks should be made payable to CVBA. You can mail checks to the address on the last page. Please let us know if any of your information has changed.

We want to make sure you can stay connected with the club to help you get the most out of your membership!