

Basic Beeswax Handling *(only an intro)*

Properties, precautions, tools,
methods



Beekeeping opens doors to many linked adventures and skills, and beeswax is yet another world you can explore with benefits — of understanding crafts, food and medicine, of gifts and treats for your family and friends, of the miracle chemistry of nature, and on and on!

This presentation is basic, merely helping you to prepare the wax you accumulated through managing your hives and harvesting honey for storage and future use.

Overview

- All beeswax is not created equal
- Safety
- Melting and Cleaning
- Molding
- Uses



There are big differences in properties and uses of wax gained from hive maintenance (burr comb) and the byproduct of harvesting (cappings)

Remember: this is one of mankind's favorite flammable substances, and it can burn you before it fires up

We will only cover consolidating your wax through melting and removal of most — but not all — of the non-beeswax in the mixture

Where you pour that melted wax matters, both in type and size of container

And then you are ready for a dizzying array of uses and projects

Beeswax is Valuable

It takes a lot of work for the bees to make:

- It takes 5 pounds of nectar to make one pound of honey
- It takes 40 pounds of nectar to make one pound of beeswax
- It is waterproof, flammable, but non-toxic
- It burns slowly and brightly, without soot



Bees create honey by collecting nectar that is (roughly) 20% sugar and 80% water, adding some enzymes, and evaporating it to 81+% sugar and less than 18.6% water. Bees consume 8 times as much nectar as well as the fats and proteins in pollen to produce the same amount of beeswax from wax glands on the bottom of their abdomens. Bees must additionally grab these flakes and work them to create the hive structures with which we are familiar. Beeswax is precious, and remember that we measure the wealth of a beekeeper not in a year's honey harvest, but in the comb the operation can use for several seasons. When honey bees were brought to North America on tiny sailing ships in the early 15th century, it was primarily for beeswax, not honey. Sweet stuff is nice to have, but an easy-to-work, waterproof, clean burning, and completely non-toxic substance is a survival tool.



Burr Comb vs. Cappings

- Burr comb is scraped or cut from the hive during inspections, manipulations
- Burr comb contains many remnants of bee reproductive and daily household activities
 - Pupal cocoons
 - Travel stain
 - Pollen stain
- More likely to contain impurities
 - Mite control chemicals
 - Environmental pollution

Less safe for food, cosmetic, medical uses



Burr comb is darker in the hive and also ends up browner in processed wax. Because burr comb is placed in heavily trafficked/worked parts of the hive, it picks up “travel stain” composed of stuff like pollen and propolis on the bees’ feet, as well as the remains of the cocoons spun by developing bees (pupae)

Waxes and fats are “chemical sinks” for many environmental pollutants — these are often not soluble in water and those that are evaporate over time. Therefore, over the up to three years that we recommend that you use a frame in your hive, it is likely to “soak up” unknown chemicals that you would not want in food or cosmetics.

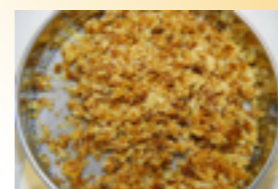
It is commonly used for candles, though it is important to make sure that there are no large impurities that might cause sparking or uneven burning. I am willing to use burr comb in soap because processing through the powerful lye mixture breaks down most compounds and soap is used externally and washed off.



Burr Comb vs. Cappings

- Cappings result from the honey harvesting process
- Cappings wax is (usually) created during the same honey flow that produces the harvest
- Less likely to contain impurities
 - Fewer activities on/around this wax
 - Short exposure to environmental pollution
 - Should contain no mite treatment chemicals
- Paler in color
- It is a good idea to process cappings separately from all other wax collected

Prized for food, cosmetic, medical uses



Cappings over honey are bright white or perhaps pale yellow in the hive, and can resemble cooked oatmeal when collected and drained in the harvesting process.

Keeping these cappings clean and light is one reason why many beekeepers use queen excluders to keep laying activities out of the honey supers.

Cappings are present in the hive for a very short period of time when harvesting honey from the current year's nectar flow: the bees cure the honey and cap it, and the beekeeper harvests it only a few days or weeks later. They therefore get little travel stain or exposure to contaminants. One reason we try to delay several mite treatments until after the harvest is to keep those chemicals out of wax as well as honey.

Cappings wax can be used for any purpose, but is particularly sought after for any product likely to be ingested.

Commercial entities seeking beeswax want *cappings*, and generally source them outside the U.S. because of U.S. beekeepers' lack of care in the application of chemicals in the hive and resulting contamination.

Beeswax is Flammable

- Never leave beeswax unattended near a heat source
- Beeswax melts around 147°F (64°C)
- Melted beeswax burns skin
- The flash point of beeswax is 400°F (204.4°C)
- The heat output of kitchen gas stove burners *begins* around 400°F
- Melt beeswax away from open flame (i.e. a double boiler)



You can easily set your kitchen on fire if you leave beeswax unattended, or expose it to a direct flame. The lowest setting on your stove is probably above the flashpoint for beeswax.

Beeswax which is overheated will darken in color.

Melted beeswax can create burns when dripped on skin.

Best methods involve a supervised double boiler or use of a gentle heat source such as a solar melter.

Raw Beeswax is Not Clean

- Even cappings contain some honey, pollen, propolis and should be washed
- “Slum Gum”
- Beeswax is lighter than water
- Most impurities are heavier than beeswax
- Bee parts float
- Many can be removed in the melting process
- You get much less by weight by the end of the process
- Some uses require cleaner wax than others



A varying but significant proportion of capping will not result in beeswax but slum gum, a substance I add to compost (needs to be a hot compost).

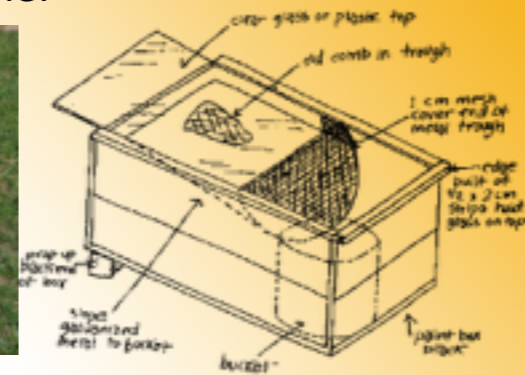
Adding water to the beeswax in your double boiler may help separate some of the contaminants that are soluble in water or heavier than beeswax, but bee parts will still float right on top of your wax and need to be strained out.

Uses like lip balm and hand cream benefit from further straining for particulate matter.



Solar Wax Melters Do a Decent Job

Buy One or Make One!



Solar melters are cheap, gentle, and effective most of the summer in this area. You can buy them (I did, to get a high capacity model that can take whole frames when I cull them each year), build them from free plans that are readily available, or put together something cheap and easy using foam coolers, foil, paper towels, and kitchen pans.

By placing some form of strainer between your comb/cappings and the container that captures the melted product, you can remove the majority of impurities in one step.

Molding

- Beekeepers use many different containers
- What goes in, must come out, sometimes with some banging
- Disposables, silicone popular
- Letting beeswax cool slowly minimizes cracking, uneven shrinkage
- If you know your end-use, it is helpful to melt to that size/weight
- For fair entries, many many requirements!



You can use household containers or buy specialty molds for beeswax. Many commonly available silicon baking molds work wonderfully (the picture on the right is from a cupcake mold). Beekeepers often use disposable loaf pans or paper plates.

You can use breakable/dentable containers if you place a (significant) layer of water in them first: the beeswax will float, become solid, and you can pry out your product.

Letting your beeswax cool over time is better than trying to refrigerate/freeze it: beeswax will crack under those circumstances, ruining candles or specialty shapes if you were trying for them. Also, it loses points if you enter it in a fair.

Typical soap recipes call for 100 g/3 oz. of beeswax: I therefore often melt to chunks about that size to minimize cutting and waste later. If you know your project, you can plan accordingly.

Uses for Beeswax



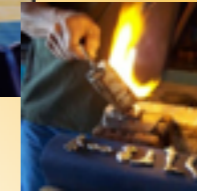
Food: nonstick coating E901!



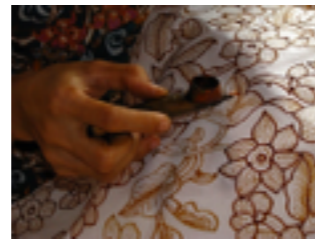
**Health and beauty aids
(including soap)**



**Art: painting AND sculpture
"encaustic"**



**Polishes, finishes and
varnishes**



Candles, of course



**Civil War Reenactor:
"Summer Load"**

And boy are there projects: these just scratch the surface. For kids who think beeswax is "gross," I ask them if they have ever eaten a gummy bear (they are coated in it). The photo at bottom left is a "batik pen" with beeswax in the handle and a coal in the head: the artist is drawing a delicate pattern on fabric that will appear after it is dyed.

We get several requests from student artists each year for beeswax for "encaustic:" beeswax to which pigment is added for vivid paintings
Civil war reenacts seek beeswax for summer battle engagement simulations!

Uses for Beeswax

Injured sea turtle with beeswax and honey dressing
The Georgia Sea Turtle Rescue Center now maintains hives
of its own.



And just to show the natural miracle that is beeswax: scientists who help sea turtles recover from shell injuries discovered that packing wounds with honey and sealing them with beeswax resulted in faster and superior recovery. At first, they reached out to local beekeepers for these hive products. Now they keep bees, as well, just for this.