

SBA Technical Data Sheet Number 10 - Recovery and Recycling of Beeswax

The recovery of clean, re-usable beeswax is central to efficient operation for any beekeeper who recognises the value of this bee product. Clean wax can be used for showing; converted to foundation or candles (or other products); or returned to appliance dealers for cash.

This information sheet is not intended as a definitive paper on the many ways of recovering, purifying and recycling beeswax. Nor does it give details of producing wax for showing. It does give a basic introduction to the process of recovering usable quantities of wax from the usual sources available to beekeepers.

Equipment

Glass or stainless steel or enamelled containers
Heavy Saucepans
Heat-resistant glass bowls
Solar Wax Extractor (optional)
Steam Wax Extractor (optional)
Heat Source (not open flame)

Consumables

Clean fresh water
Wax scraps
Muslin, Flannel or Cotton Wool
Washing-up liquid

Method of Preparation

Wax Purity

The wax you start with will normally only contain the usual 'impurities' from the beehive – such as propolis, honey, fragments of wood etc. Wax melts at around 65 degrees Celsius, and above 85 degrees it will start to discolour. Do not mix your wax with any other materials, unless you intend that it should NEVER in future be given back to bees. Bear in mind that if used for foundation making, at some stage someone may eat it, and that someone could be yourself, or a customer. Adulteration of beeswax, for example with petroleum jelly, or other waxes, should be avoided at all costs. If you are not sure of the source or purity of second-hand wax offered to you, discard it. Do not allow wax to come into contact with metals other than stainless steel, especially when molten, as many metals will discolour it, including copper utensils, zinc (galvanised) containers, and steel. The discolouration is impossible to remove and renders the wax unsuitable for use in foundation.

Sources of Wax

Sources of wax include brace comb; old brood frames; old super frames; pressed remains from the heather press; cappings. Of these the hardest to render are old brood combs. These will usually produce the most strongly coloured (and probably the dirtiest) wax, although with care useful wax can be recovered from them. Cappings provide the cleanest and most finely coloured wax for showing. If these mat-

ters are important to you, then consider processing wax from different sources separately.

Steam Extractor

If you are using a steam wax extractor, follow the instructions with the appliance. You will produce a wax product which is relatively clean and free from fine debris, and which will only require final filtration at most to render it suitable for manufacture of foundation or for showing.

Solar Extractor

A solar extractor, if used with care, will produce a fine supply of relatively clean wax from any source, including usable wax from old brood combs. Any honey which is extracted along with the wax can be separated and fed back to the bees, although bear in mind that it is not suitable for sale as it will have inevitably been overheated in the extractor. The cakes of wax from the solar extractor should be rinsed, dried, then retained for final filtering.

Other Methods

Those not possessing a steam or solar extractor must find an alternative method of separating the wax from the remains of the combs. However this is not as daunting as it may seem. Here is one method. It requires a reasonably large container in proportion to the volume of wax, and a source of heat to raise the temperature of the water high enough to melt the wax.

The essential principle is to enclose the wax scraps inside a fabric which will retain the largest fragments of dirt, and then submerge the whole lot in a vessel (see precautions on metal vessels) large enough to contain the wax and a volume of water hot enough to melt out the wax. Use a bag of fine muslin or linen to contain the wax, and weighted (e.g. with a clean stone, NOT a metal weight) to sink it to the bottom on the vessel. Do not boil the water. Beeswax melts at around 65 degrees Celsius, and above 85 degrees Celsius it will discolour. Therefore careful control of the water temperature is essential, preferably with some kind of automatic thermostat if possible. Leave the bag and water undisturbed until the wax has melted and risen through the bag to lie on the surface of the water, then turn off the source of heat and allow the wax to cool and solidify. The wax can then be lifted away and broken up into smaller pieces for final filtration.

The container in which you carry out the whole process should ideally be stainless steel. Bear in mind the advice above regarding wax coming into contact with metals.

Filtration

Cleaning and Filtration

The wax from any of the extraction methods above will generally be reasonably clean, but not clean enough for making candles or foundation, or for showing. It requires further filtering.

The principle is to re-melt the wax, then pour it, while molten, through a fine filter. Suitable filters can be made from flannel cloth, or several layers of muslin. A layer of cotton wool supported by muslin is quite good.

The wax must be melted in a water-bath. This can be as simple as a large glass jar placed in a saucepan of water, with the water coming about two-thirds of the way up the jar. A proper double saucepan is better. Do not boil the water. Allow the wax to melt then add more piece by piece as it continues to melt. When the desired amount of wax has melted pour it through the filter into a final container. A heat-resistant glass bowl or dish is best for this, and if the inside of it is first wiped with a very thin film of washing-up liquid, this will act as a release agent producing a reasonably sized cake of wax for storage. The filter can be supported over the top of the dish by tying it around with string or a rubber band. The dirty filter can, if it contains a lot of wax, be returned to the start of the process with the next lot of combs to recover some of the wax from it.

Another option is to allow the clean wax from the filter to run freely into a very large open pan of cold water. The clean wax will solidify almost instantly, but the mass of clean wax particles can be easily scooped up from the pan of water, laid out on a towel to air dry and then bagged for storage. The advantage of this method is that the clean wax is in generally small pieces which are easily broken up further, and thus melt much more quickly when they are required for use.

Shelf Life

Beeswax strictly speaking has an unlimited shelf life, although it will soon acquire a surface 'bloom' of powdery yellow or white if exposed to the air. This is not damaging, but it is best to remember that bees will be most readily attracted to freshly cast wax foundation. Old wax can generally be refreshed by melting and re-casting it.

Health and Safety Information

The following hazards are identified:

1 Danger or burns and scalds from:

1. Boiling water
2. Hot wax
3. Utensils in contact with hot wax
4. Heat sources

Precautions:

1. Protective apron and covered sleeves
2. Long handled stirring utensils
3. Children continuously supervised
4. Utensils and products cooled or left out of reach until cool
5. Heat sources out of reach of vulnerable persons

2 Danger of fire from:

1. directly (over)heated wax
2. open flame heat source
3. wax splashes on heat source

Precautions:

1. Do not heat wax directly – always heat in a double container, and heat the water, NOT the wax
2. NEVER use open flame heat sources, use a hotplate

3. Maintain cleanliness to avoid wax reaching hotplates
4. Use a smoke detector in the room
5. Keep a suitable fire extinguisher or fire blanket to hand
6. NEVER LEAVE THE EQUIPMENT UNATTENDED WHILE WAX IS HEATING

DISCLAIMER: - Great care has been taken in the preparation of this technical sheet to ensure accuracy but the Scottish Beekeepers' Association cannot accept liability or responsibility. Beekeepers must therefore use the information at their own discretion and risk.

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