Chapter 8

Dealing with the crop of honey and beeswax

8.1 Section honey

The simplest form of honey crop to deal with is that in which the bees have stored the honey in small wooden *sections* a little over 10 cm (4 inches) square, holding about 400 grammes ($\frac{3}{4}$ lb) of honey each. To use these, a section crate must be bought to sit inside or take the place of a super, and the sections must then be fitted inside it with each row of three separated from its neighbour by a tinplate (or plastic) divider. Before the sections, which are purchased flat, can be used, they must be folded up and fitted with starters of thin wax foundation. To prevent the wood breaking when you fold it, damp the outsides of the folding joints. Be sure you insert the foundation the right way with pairs of opposite parallel sides of the hexagonal cell bases lying *vertically* and not *horizontally*, and points of the hexagons at the top and bottom, not at the sides. As the sections are square, it is merely a matter of inserting them the right way in the crate if they are fitted with full sheets of foundation. However if you use starters of part sheets, make sure you cut the wax the right way so that the cell bases have the proper orientation when the starter is hanging from the top of the section.

At harvest, the sections are simply removed from the box, have any propolis carefully cleaned off, and are ready for sale or use. They are probably more saleable than any other form of honey. Tidily wrapping them in clingfilm keeps them clean and enhances their appearance.

There are three reasons why they are not universally used. The first and least important is that all the beeswax from the crop is lost, or at least is eaten with the honey. However beeswax is a rather specialised item with a limited market, and limited uses by the beekeeper and in the home, so this loss might be tolerated.

The second is that they involve purchasing extra equipment — crates and dividers — and are themselves expensive and wasteful as they cannot be re-used. The premium price obtainable however would compensate for this.

The third reason is the deciding factor. Bees HATE them. They dislike the confinement in small separate units apart from the queen and their sisters. They are often very reluctant to enter them and start storing honey there. If the season is poor, they sometimes refuse point blank. Sometimes an old section in the crate with some honey in it will entice them up to start, sometimes not.

The overcrowding in the brood nest when bees stay down in this way is only too likely to trigger off swarming, and many beekeepers therefore feel the game is not worth the candle, particularly if all you have at the season's end is a collection of unsaleable and unusable partly filled sections.

Some more modern forms of plastic section are said to be easier to manage, and more acceptable to the bees. After some experience you may choose to experiment with some form of section honey, but it is advisable to gain some experience with shallow frames first.

8.2 Honey in shallow frames

Until recently the commonest way of obtaining honey locally was in shallow extracting frames fitted like the brood frames with wired wax foundation.

Once the honey is sealed it is ready for harvest, and it is removed from the combs in a centrifugal honey extractor, so that the combs can be returned to the bees for re-use which means a much quicker second fill of the same super as the bees do not have to use time and honey in secreting wax to re-build the comb. It has been estimated — probably by comparing the chemical make-up of carbohydrates (honey) with that of hydrocarbons (wax) — that bees use as much as 6 kg of honey to produce 1 kg of beeswax.

When extracting honey you should work in a warm room and with freshly removed supers. Combs kept for more than a day or two away from the hive are much more difficult to extract, particularly if they have been allowed to cool down.

Before extracting, the cappings must first be removed from the combs by cutting them away with a knife. I now use an uncapping fork, holding the comb on edge above a large bowl to receive the cappings, and working upwards. Special uncapping knives can be bought, and a pail with a batten over it having a nail sticking up from it on which the end of the top bar of the frame can be impaled is better than a bowl. The cappings in the pail or bowl are left for processing at the end. Remember to uncap *both* sides of each comb.

Make sure the extractor has a fairly evenly balanced load before starting to spin it (and of course make sure that it is clean and honey-tight before you begin).

With the small tangential extractors, spin gently to extract the bulk of the honey from the outer comb faces, but not enough to force the honey on the inner faces to burst the mid-ribs. Then turn the combs and spin fairly hard, turn again and finish the first face.

When the level of extracted honey in the extractor rises to near the bottom of the extractor cage, it is time to run it off from the tap through a coarse strainer into a settling tank or ripener.

Finally after finishing off the extracting, the mush of cappings and honey can be dumped into the strainer to let as much honey as possible drain from them. The washing water from the cappings when they are turned out from the straining cloth forms a good basis for a brew of mead if you like that kind of thing. When you are finished, wash all the equipment starting with *cold* water so that scraps of wax float away and do not melt and adhere to everything.

Next day the honey should be run off (ideally through a finer strainer) into jars or storage tins or pails from the settling tank. Honey jars in 2017 cost about 36p each or more. If you are going to sell honey in jars, then be sure not to under-fill them, not to spill honey on the outsides, and also to use commercially produced labels which state in the legally required type size the legally required particulars about weight etc. which now includes the name and address of the producer, and some form of batch number which will allow the producer to identify when and where the jar originated if there is any come-back from a customer. The country of origin (either UK or Scotland) must also be shown, and a "best before" date (which for the small producer can be printed as "Best before end. . . " allowing the producer to fill in a year two years after the bottling date (which is probably about right). The appliance dealers will produce labels for you at reasonable cost with the appropriate name and address particulars, but of course you must add your own batch number when you jar the honey.

Honey which has not yet been sealed by the bees is usually unripe with too high a water content to keep satisfactorily. It tends to ferment. Combs with more than a small area of unsealed cells should not be extracted, but should be returned to the hive for the bees to finish.

8.3 Beeswax

The wax cappings (and any other comb scraps but *not old brood comb*) should be washed in several changes of water, and can then be melted down satisfactorily in a double saucepan over boiling water.

N.B. DO NOT RENDER WAX BY MELTING OVER DIRECT HEAT OR YOU WILL SCORCH IT BLACK AND MAY EASILY SET YOUR HOUSE ON FIRE. IT IS HIGHLY FLAMMABLE.

The molten wax should be allowed to set, and afterwards the surprisingly dirty cake of wax removed from the saucepan where there will be a residue of washing water under it. Some of the dross can be scraped away and the cake then be allowed to dry. The dirty wax must then be carefully re-melted and strained though a pre-heated fine filter — kitchen paper or nappy liners are good. A carefully timed sojourn in the *cool* oven of an Aga does the job well, but avoid prolonged heating which scorches and darkens the wax. The clean molten wax can then be poured into a mould and allowed to set. Small moulds can be purchased giving cakes of about 25 g (1 oz) in weight. For larger cakes a pyrex bowl makes a good mould, but it is hard to get a large cake to set without cracking.

Clean wax in bulk can be sold for not a very high price to the appliance dealers, or in part exchange for goods. It makes excellent *candles* and *polish*, and that can probably be sold for a better return. I now have a press for making foundation and have more wax for that purpose than I need. Making foundation is a rather slow process and needs a certain amount of dexterity if it is to be done successfully.

8.4 The problem of Oil Seed Rape

When Oil Seed Rape was a popular crop with farmers locally, honey yields improved greatly. It is a crop that bees love, and is of great benefit to beekeepers provided the farmers do not mis-time their insecticidal spraying. Its main drawback for the beekeeper is that it yields a honey high in the sugar called dextrose, which therefore granulates quickly into a very hard set honey when it cools down. If you try to spoon it out of a jar in this state without warming it up first, you will bend the spoon and crack the jar.

It granulates while still in the comb and even a small admixture of it will solidify a large amount of other honey. Honey set solid will of course not spin out in the extractor. There are three possible approaches.

First one can take supers very promptly off hives as soon as a reasonable proportion of the honey is sealed, and certainly before the super is completely filled. If it is quickly extracted at this stage, then the combs can be preserved, but any delay means that the battle is lost. If one succeeds, the extracted honey will again granulate before it is passed through a fine filter, so the best procedure is then probably to be content with only one coarse filtering, and then to stir the honey vigorously as it is setting. This breaks up the crystals and produces a fine soft granulation which is much easier to deal with. If it does set too hard, gentle heat will soften it again.

Second one can sell or use the honey as set honey in the comb, eating comb and all. This is a simple and straightforward solution, but not everyone likes eating beeswax.

Thirdly one can cut the combs out of the super frames, subject them to gentle heat, mash up the resulting mess and strain off the honey quickly through a warm strainer before it sets again. Be very careful not to over-heat, since this can ruin the honey and leads to raised levels of hydroxymethylfulfural (HMF). If the level of this is above 40 mg per kg of honey, then the honey is deemed unfit for human consumption and must by law not be sold. At the end of this chapter is a table giving a list of useful temperatures for honey and wax processing. Be guided by this and use a thermometer.

This third approach is the one I have usually used, and is the reason I no longer use wired foundation in honey supers. Until recently it also meant that all my honeycombs only lasted one season. It is wasteful of foundation, but in compensation has meant that I have had a plentiful yield of beeswax every year.

Local Oil Seed Rape growing declined in our area from about the year 2000, but there has been a revival in the last few years. If other crops are being foraged, then the extractor can again be used.

Though I am still using unwired foundation, I can nevertheless spin combs containing other honeys with care and then re-use them.

8.5 Heather Honey

Heather honey is a different story. It too will not spin out in an extractor because it is *thixotropic*, i.e., it is like a non-drip gloss paint. It forms a semi-solid gel until it is stirred, and then becomes liquid for a time, but re-sets again into a gel if it is left to stand.

If you fit *unwired thin super* foundation in your supers for heather honey, then the simplest way to harvest it is as cut comb honey where the comb as well as the honey is eaten.

Another good way of dealing with it is to scrape the combs down to the mid-rib with a spoon or a special Smith scraper, wrap the resulting mush in a straining cloth — a pair of lady's tights is very effective — and press the honey out. A proper heather honey press is expensive but it is possible to improvise for this job if you are operating on a small scale. The residue after pressing can again be rendered down for wax. Dunblane and Stirling Beekeepers have two small heather honey presses for use by members, so many of our members get their heather honey pressed that way.

Of course heather honey *sections*, if you can persuade your bees to fill them, are almost worth their weight in gold!

Note: The heather honey described above is that from the common ling heather which yields nectar in August-September in Scotland. Bell heather and cross-leaved heath yield a very dark honey looking almost like treacle, but of a purplish colour. It is gathered a month earlier than ling heather honey. Unlike ling heather honey it can be easily extracted. These kinds of heather are not nearly so common as the ling heather, so if you want to try for them, you will have to enquire about a good site where these plants grow.

Appendix Some Useful Temperatures for honey and wax handling

The table below has values copied from a leaflet produced by the Scottish Agricultural College, but with some errors corrected. Fahrenheit temperatures in whole degrees were the orignals. The Celsius temperatures have been rounded to the nearest whole degree.

Fahrenheit	**What happens at this temperature**	**Celsius**
235^0	Boiling point of bee candy solution (5 lb sugar to 1 pint water) **Use candy thermometer only**	113^0
185^0	Beeswax starts to discolour when subjected to dry heat	85^0
150^0	Caramelisation of ling heather honey may occur depending on length of time	66^0
146^0	Average melting point of beeswax but can vary according to composition	63^0
145^0	Heating for 30 minutes destroys yeasts to prevent fermentation but can impair some honeys	63^0
140^0	Maximum for warm water to flush and dissolve honey in machines Microwave treatment to reliquifiy granulated honey in jars	60^0
130^0	Separating and melting granulated honey from cappings — 1–2 days	54^0
122^0	Honey viscosity suitable for pumping and filtering Small granules melt in 1–2 hours	50^0
120^0	Stirring for cooled bee candy solution	49^0
104^0	Maximum for spinning cappings in centrifuge	40^0
90^0	Pre-heating heather and oil-seed rape honey combs prior to extraction	32^0
80^0	Pre-heating blossom honey combs prior to extracting — 12 hours	27^0
75^0	Introducing seeding for granulating honey (5%–10% seed) Introducing yeast cultures to mead mixtures	24^0
57^0	Encourages rapid granulation	14^0
50^0	Storage of honey in bulk or jars	10^0