

National Bee Unit

Replacing old brood comb

April 2024

Regular replacement of brood comb is an important part of routine colony management. As the brood comb ages, it may become embedded with traces of cocoons, faecal matter and propolis. Regular comb replacement also helps prevent disease and accumulation of residues from varroacides. This fact sheet provides advice for rotation and recycling of frames from hives.

Why should I change old brood combs?

As the wax in the frames ages, it begins to accumulate pathogens, and chemicals from varroacide treatments. The frames may also become damaged, or may contain extensive amounts of inconveniently placed drone comb.

How often should I change them?

It is best practice to replace brood comb *at least every three years*. However, more frequent replacement is advised if you have had disease in the colony, or after frequent use of certain varroacides. Varroacides that contain the active ingredients thymol or tau-fluvalinate can leave residues within the wax. Regular use of these products may lead to a build-up, or residue, of the active ingredient in the wax, so frames that have been in regular contact with them should be replaced more frequently.

How do I replace frames that are in the hive being used by bees?

There are two easy and effective ways to swap out old frames for new frames:

- A. To replace old comb with prepared drawn comb
- B. To perform a 'Bailey Comb Change'

A. Replacing old comb with drawn comb

To create drawn comb, a brood chamber is filled with frames of foundation and placed over a queen excluder on a strong, queen-right colony. This should be done during a honey flow, otherwise the bees won't draw it out with wax. When the combs have been drawn out, they can be stored for use as replacement combs.

Towards the end of the season, frames that need to be replaced should be moved to the ends of the brood chamber. During winter, these frames become free of brood. In early spring, before the colony is expanding rapidly, they can be removed and replaced with drawn combs. Use of foundation at this time is not possible, as without a honey flow or extensive feeding, the bees will not draw it out. This exchange can take place on a warm day in March. Ensure that sufficient stores remain and, if not, feed the bees.

B. How do I perform a Bailey comb change?

Prepare a clean brood chamber filled with frames of foundation. Place this chamber over the existing brood chamber on a strong, queen-right colony. Unless there is a strong nectar flow, feed with sugar syrup made from 1 kg of sugar per 650 ml of water. When the bees have drawn out some of the foundation, find the queen and place her in the top chamber. Put a queen excluder over the old (bottom) brood chamber, trapping the queen in the upper chamber. If possible, arrange a new hive entrance between the two brood boxes and close off the old entrance. This helps to reduce the amount of pollen stored in the old lower combs. After three weeks, remove the old brood chamber. The brood will have hatched and the comb can then be rendered to recover the beeswax. A diagram demonstrating the Bailey comb change is shown in Figure 1.

This system is ideal for replacing all the combs at once and is best performed in spring, provided the weather is warm. March is suitable, but remember to keep feeding, so the bees have the energy they need to build the wax comb.

Can I replace the brood comb with foundation?

Care must be taken when introducing frames of fresh foundation into established colonies with brood. This can create problems, especially in smaller colonies, as a large number of worker bees are needed to draw out the wax.

In double brood colonies, foundation placed in the bottom brood chamber may be spoiled, as the bees may nibble the foundation away, leaving holes between the comb and the bottom bars of the frame. In double brood colonies, a small number of frames of foundation can be put into the upper chamber to avoid this from occurring. Don't place foundation in the centre of the brood nest, it is best placed close to the edge of the brood nest. Don't place too many frames of foundation into the brood box; use two or three at most.

It is always preferable to replace old comb with drawn-out comb in colonies.

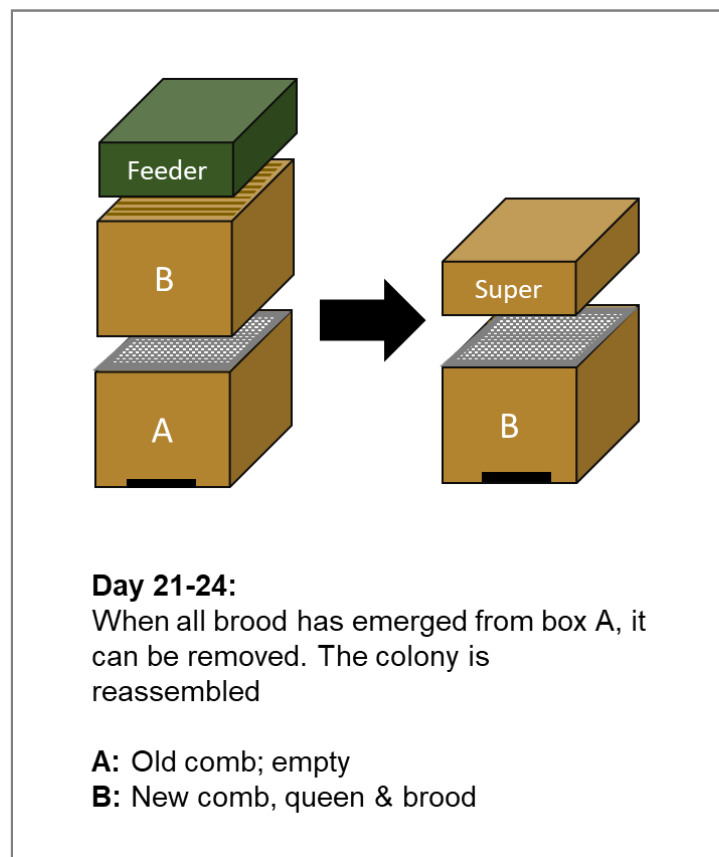
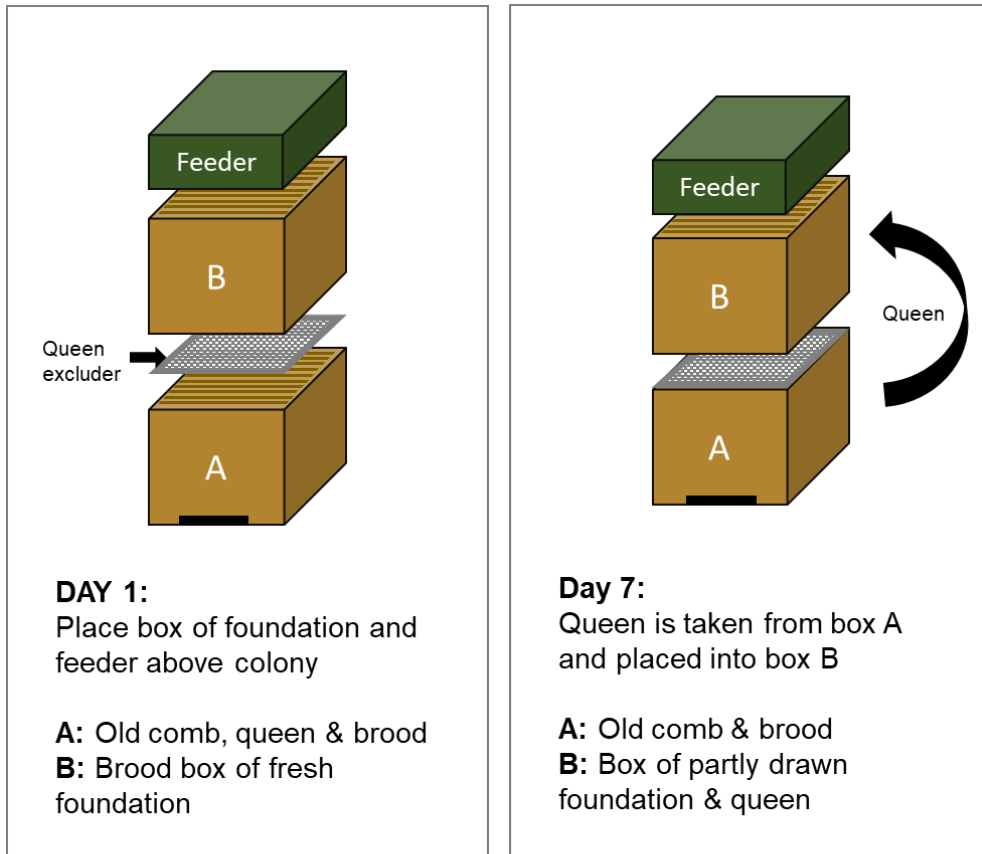


Figure 1. A figure demonstrating how to perform a Bailey comb change.

How do I replace frames of plastic foundation?

Although plastic foundation can be treated in a similar way to wax foundation, before adding it to the colony, plastic foundation must be coated with a layer of wax. Fresh, clean wax should be gently melted in a *bain-marie* before being rolled onto the plastic foundation; alternatively the frames can be dipped in the wax. The bees won't readily draw out the foundation without this thin layer of wax.

Plastic foundation can be re-used many times; the wax, with any associated contaminants or residues, is scraped off and a fresh layer of melted wax is applied to it.

Can bees draw out comb all season?

Bees do not draw out comb all-year round or in all conditions. The colony needs to be queen-right and there needs to be a good nectar flow to meet the high energy demands of creating wax. In addition, if the colony has ample space for storage in empty cells, they are unlikely to be stimulated into drawing out further comb.

For wax to be drawn out, the following conditions need to be in place:

- a good nectar flow or sugar syrup feeding
- warm weather (to enable the bees to secrete wax)
- a laying queen
- a lack of space in the colony for further stores
- an abundance of young bees (young bees make the wax)

What if my foundation is too old?

Old foundation tends to become hard and brittle and bees tend to chew it into holes. It can be restored by carefully warming it, which releases the oils and makes it usable again.

What do I do with the old frames?

Spent frames and old comb are easily destroyed by burning and replaced with fresh frames and foundation. However, if you wish to salvage the frames, the wax can be rendered down in a piece of equipment called a steam boiler, and the frames cleaned for re-use.

To do this, the wax can be cut out of frames and separated into two piles; clean-looking wax, from super frames and lesser used brood frames, and dirty-looking wax, from old brood frames. The wax is then rendered down by gently heating up in water; caution is needed as hot wax presents a fire hazard and a risk of burning. *Hot wax should not be left unattended or allowed to boil.* When melting wax, heat protecting gloves and eye protection should be worn at all times. Once the wax is rendered down, it can be disposed of if it's dirty, or recycled if it's clean.

Any undamaged, left-over frames can be washed in hot water (approximately 80°C) mixed with washing soda/soda crystals (mixed at 1 kg soda crystals per 4.5 litres of water) before being re-used with fresh sheets of foundation or starter strips.

Please do not dispose of unclean frames or wax in the household waste. If the wax and frames are not disinfected by boiling or burning, any pathogens present in them could pass into the environment.

Is there anything else I should be aware of?

Make sure that you only use 'narrow' spacing between the frames; this is the standard spacing on Hoffman frames for National hives.

Combs at the end of the box tend not to be drawn on the outer face. This is because the bees find it hard to cluster there and generate wax. Turn the frame around or move it further into the box so that they can draw it out.

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April 2024

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