

DON'T SUBJECT YOUR BEES TO A BUILD UP OF PATHOGENS

The Need to Change Comb

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Many of you will be familiar with the function of the liver to break down and excrete harmful substances from the body via the kidneys or rectum.

Imagine if this important organ stopped working. Imagine all of those substances not getting broken down and staying in your body to build up and slowly poison you. What do you think would happen? Well you would most probably get very ill and, as the pathogen load built up and failed to leave the body, you would ultimately end up dying.

Honeycomb is Like the Liver

To use an old analogy – the comb within a honey bee colony has a similar function to the liver of a human. It absorbs harmful pathogens and also pesticides which may be brought into the colony via pollen and nectar from flowers. These accumulate over time and evidence suggests that these can then have strong negative effects on colony health (Pettis, et al, 2013).

These harmful chemicals may affect the synthesis,

transport, action or elimination of natural molecules, such as hormones or enzymes which are responsible for maintaining bee development, immune mechanisms and behaviour (Chauzat, et al, 2009). It is therefore important that beekeepers change the comb in their colonies regularly, at least every three-to-four years to lessen pathogen loads which build up in the wax over time.

Below are a few methods outlining how a beekeeper might do this. I have included three of these and hopefully one will suit your practices.

The Demaree Method

The Demaree method is mainly used to prevent swarming or to make colony increase. However, with a bit of modification, you can use it for a comb change. On your next visit to the apiary, take a spare brood box complete with foundation for each colony to which you would like to add new comb.

- Once at the apiary, open the colony and place the original brood box with its brood to one side and put the spare

box with foundation on the original floorboard.

- Remove one frame of foundation from the middle of the new brood box.
 - Inspect the original box and find the queen. Place her and the frame she is on in the centre of the new box, removing any queen cells that are on that frame.
 - Put a queen excluder on top of the new box plus any supers which were on the original brood box.
 - Place an additional queen excluder over the supers.
 - Returning to the original box, inspect the remaining combs, removing any queen cells you find to deter the colony from swarming. Move the combs to one side of the box and place the frame of foundation which was removed from the new box in to fill the gap. This box now goes on top of the second queen excluder.
 - Close the hive and the job's a gooden!
 - Repeat for all other hives as required.
- On your next inspection, a

week later, it is then important to destroy any additional queen cells found in the top box, or the colony may swarm. Alternatively, you could cut out the queen cells and use them in nuclei. Remember to add more supers as and when required to help minimise the chances of swarming!

This is a versatile method which can be used to increase colony numbers, for swarm control and for comb changing. Once the brood hatches from the top box, dispose of the old comb by burning. When executed properly, the Demaree method will yield very strong colonies and, as a result, requires a bit of experience before trying it out! I would not recommend it for beginners, or if you wish to try it, seek advice from an experienced beekeeper.

Bailey Comb Change

One of the simplest and most popular methods of changing comb is the Bailey comb change. As well as changing out old comb, this method allows you to convert from a National brood box to 14x12 or Commercial and vice versa.



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As with the Demaree method, prepare a box of foundation and simply place it above the current brood box. If there is no nectar flow, feed the colony with thick sugar syrup, ie, 1 kg of sugar to 650 ml of water, to encourage the bees to draw out the foundation.

Place the queen in the top box containing the fresh comb and put a queen excluder between the boxes containing the old and new comb.

Continue to feed if necessary.

Place a queen excluder on top of the new brood box and add supers.

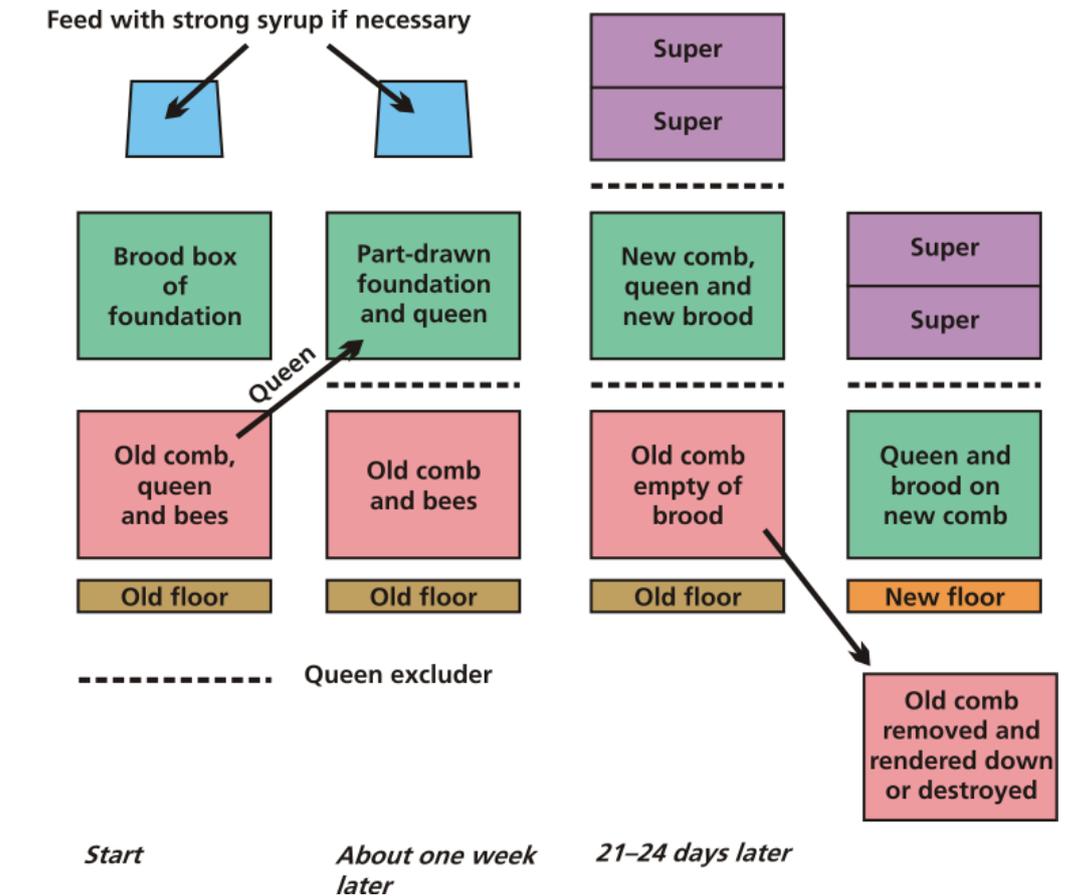
After three weeks, once the brood has hatched from the bottom box, remove it and burn the old comb. At this point you can replace the old floor and crownboard with a clean set.

There is more information on BeeBase (see References).

Replacing Comb in Stages

You may simply want to replace three or four combs per year. You can do this by removing the outer combs from each side of the brood nest or super and replacing them with frames containing clean foundation. When using this method, I find it useful to mark the date on the top bars so that I can track how old the comb is (although colouration of the brood comb can also give an indication). You may want to use spacers of the queen colour code for the year on the end of frame lugs for SN or DN 1 frames. As the colony expands, the bees will draw out the new comb and use it for their nest. The old comb that has been removed can be burnt.

You may have noticed that I have not given the option of rendering down the brood comb. If you wish, this can



The steps in the Bailey comb change procedure

be done, providing it hasn't come from a diseased colony. However, you are likely to find that you are left with a lot of brown or black gunk (old shellac) and not a lot of wax. The little wax you do get then needs to be cleaned several times in order to make it suitable to use for candle, cosmetic or polish making. In my opinion, this isn't worth the time!

Sign up to BeeBase!

As ever, it is important that you are signed up to BeeBase. Although not compulsory, it is important to register so that we can help protect your colonies. By registering your e-mail address, you will receive alerts about pest and disease incidences in your area, enabling you to take extra precautions when inspecting your colonies.

If we don't know where apiaries are then, in the event of a foul brood or an exotic

pest outbreak, we will not know where to send our Bee Inspectors and our eradication and containment efforts will be seriously jeopardised.

You can register on BeeBase at <http://www.nationalbeeunit.com/index.cfm> ☞

References

Pettis, JS, et al (2013). Crop pollination exposes honey bees to pesticides which alters their susceptibility to the gut pathogen *Nosema ceranae*. *PLoS ONE*, **8**(7), e70182.

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NBU Fact Sheet 'Replacing Old Brood Comb' (<http://www.nationalbeeunit.com/index.cfm?pageid=167>).

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