Zest Hive Blog

One of the aims of the Exeter Beekeeper's Association (EBKA) is to provide a forum for Members to learn more about Beekeeping. One of the ways the EBKA apiary achieves this aim is through keeping bees in various different types of bee hives. Recently, apiary members have built a Zest Hive which is principally a top-bar hive but, through its design, the materials used in its construction, and the beekeeping strategy suggested by the Zest hive creator, William Summers, provides an alternative method to traditional keeping. Zest Hives aims to keep bees warm and dry so that they are:

> **Healthy** by providing accommodation whose temperature is easier for the bees to regulate the and promotes increased disease resistance.
>
> **Happy** by reducing the need to work hard to regulate the hive temperature, which costs the bees in energy and stores; and avoids overcrowding by giving bees plenty of room for the colony to grow and slower to swarm (other than supersession).
>
> **Occupied** through the requirement to continually make their own comb (Zest does not use foundation).

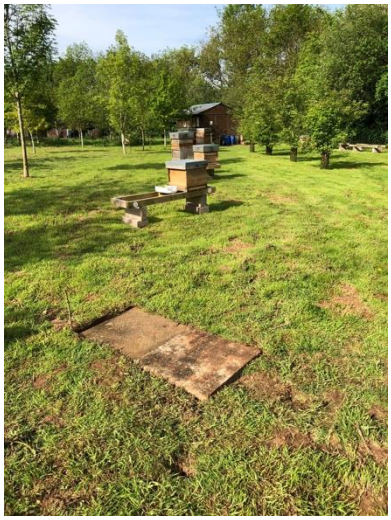
An analogy is that the Zest hive provides the bees with a modern, well insulated, eco house rather than a Victorian-era house with little insulation and potential for damp. More information regarding Zest hive design, construction and management can be found at www.thezesthive.com

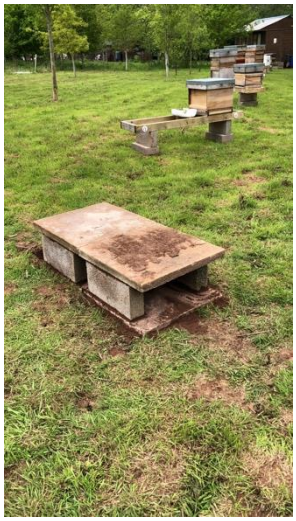
Construction of the Zest Hive

Instructions and videos for construction of a Zest Hive are available on the Zest Hive website. The Zest Hive is primarily a large rectangular cuboid constructed with insulation blocks that sit on a wood, concrete block and slab support. Minimal DIY skills are required to build a Zest, which can be built in less than an hour if you have the materials to hand.

We decided to improve robustness of the apiary hive by cementing components together, although this is not a requirement of the original design. We also substituted wood supports for more concrete slabs.

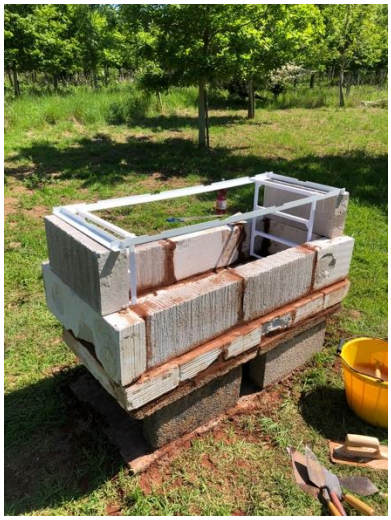
First, we had to decide on where to position and in which direction to orientate the hive. The guidance suggested the hive is orientated North/South so that both sides gets sunlight. Having found our spot, we undertook some ground work to level the ground and laid two 600mm square slabs. Once level, we cemented on four concrete blocks to make two parallel rows of two blocks; atop which we cemented another two slabs. This provided us with our support for the hive.

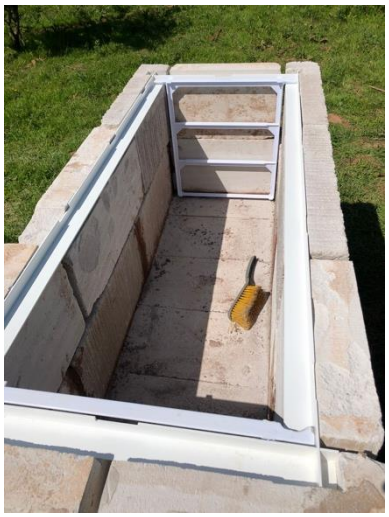




Ground work and support structure

Once the cement was cured we were able to build the hive itself. This comprised a bed of eight longer 660mm insulation bricks atop which we cemented two rows of smaller 440mm bricks. Once cured, we cut channels into the top row of bricks to hold the Zest frame carrier and to allow the bees access. This channeling was required due to our use of cement to increase the robustness of the hive, and had the effect of increasing the hive depth. Without the channels the queen excluders would not reach the bottom of the hive and would be ineffective. We sanded the inside of excess cement before pointing the bricks to close gaps. Thereafter, we placed another eight longer insulation bricks to insulate from above, before placing a sheet of recycled metal roof sheet on top to keep out the rain.





Taking Shape

Finished Product

With the construction of the hive completed, we were able to prepare the inner workings. We drilled some holes in three of the roof bricks to permit roof feeders if required; these being blocked by a variety of gin and whisky stoppers while not in use. We prepared the Zest frames by painting bees wax onto the T-bars which would assist the bees when drawing out their own comb. Finally, we inserted the frame carriers, frames queen excluders and more insulation ready for some bees.

Zest with blue Queen excluders
and partitions

Our first bees

The instructions for Zesting (a new verb?) suggest that you can fill your hive via three ways: drop a swarm into the hive, a shook swarm from a traditional hive or, the Zest preferred option, transition bees from British Standard National frames onto Zest frames. Despite the high numbers of swarms reported this year, we opted against this option as, without a period of quarantine, there was a risk of introducing disease into the apiary from unknown bees. We discounted a shook swarm due to the disadvantage of knocking back the strength of an established colony and, as the apiary colonies were all established and working well, we did not want to move them. Therefore, aided by the really hot June, we opted for something a bit radical. As you can alter the size of the brood area, we reduced the size and used it like a nuc. We inserted a Queen Cell on a frame with brood and a frame of food with attendant workers.

Establish our colony with Zest principles.

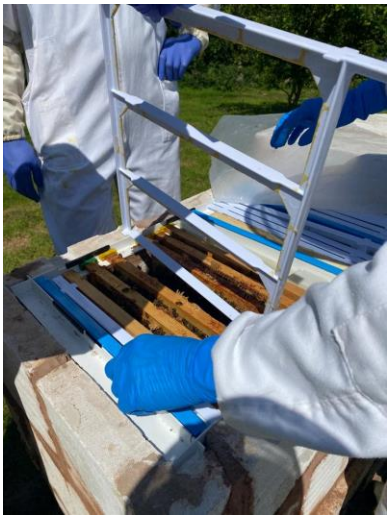
We now had two tasks at hand. The first, and most important, was establishing our little colony. The second was to keep our bees in accordance with Zest principles. We believed we could achieve both. We needed to set the conditions to promote colony growth while utilizing the inherent advantages of the Zest Hive.

Inspection 1. 21 June 2023

On the first inspection, we discovered that the Queen had hatched and saw her running on the frames. This was great news as it was the first step to growth. We took the opportunity to review how we had set-up the hive to ensure we were employing the Zest hive's strengths to ensure the best outcome. The bees were all down one end of the hive, but the first frame was adjacent to bare insulation brick. To aid temperature regulation we inserted an excluder with added insulation.

Inspection 2. 28 June 2023

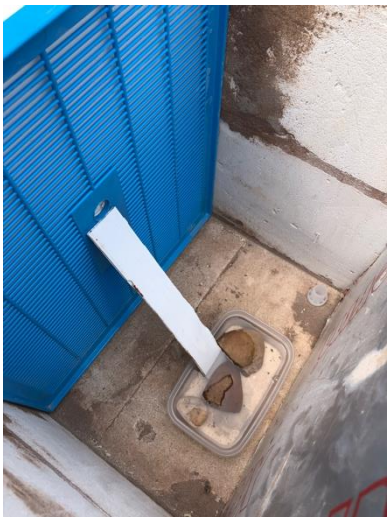
If our bees were following a Zest format, they should start to draw their own comb once the 3 national frames were fully drawn out. Our expectation was that they would first build comb on the bottom of the wooden hives before building new comb onto the Zest frames. Thereafter, we could remove the wooden frames beyond a Queen excluder and replace with new Zest frames and so on until our hive and bees were fully converted to Zest frames.



A Zest frame.

Our second inspection saw the bees settled and looking well; although there was no new comb on the bottom of the wood or on the Zest frames. Our small colony needed feeding to help them draw comb. Zest procedures have evolved from using the roof feeders to an internal feeder beyond a Queen excluder. This was achieved with some syrup in a tub with some stones to allow the bees to feed without drowning. A ramp was placed from a designed hole in a Zest partition down to the syrup. We would wait and see if this would work for our bees.

Having checked the bees out, we were pleased to see the Queen alive and active. We tried to catch her to give her a nice red marking to show she was born this year. She was quite wriggly and even tried to fly across the top of the hive before we were able to pin her down and daub her with her new colours. Afterwards, we tucked them all up with hopes that they would feed and draw comb.



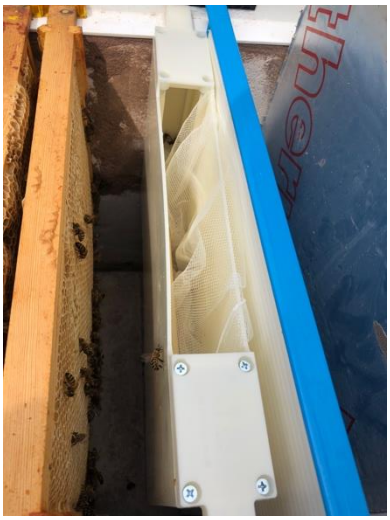
Internal feeder

Inspection 3. 5 July 2023

The Zest hive was starting to stir interest in our wider membership and was a highlight at a members' open day. However, it was noted that the bees could not find the internal feeder, even though it was right next to them (later research into the Zest operating procedures suggests putting comb in the syrup to help the bees find the it and to act as a feeding platform so the bees do not drown in the syrup).

In the meantime, a proposed solution was the purchase and employment of a frame feeder. For those who are unaware, a frame feeder is a plastic vessel, similarly shaped to a standard frame, that you fill with syrup for the bees to feed on.

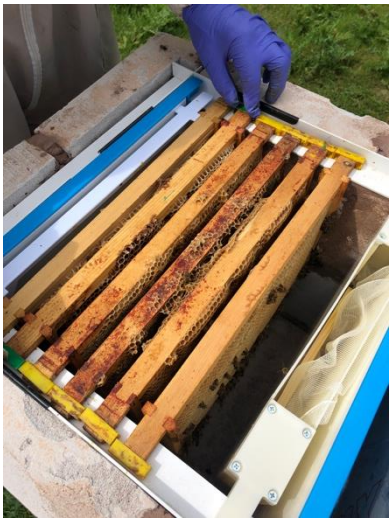
So, on the subsequent inspection we were prepared with a new frame feeder. A top tip is to fill the feeder tank with fine netting such as discarded garden or fishing netting found on the beach (always think reuse, recycle), which acts as a climbing net should the bees fall into the syrup so they do not drown. While we inserted the new frame feeder and removed the redundant internal feeder we identified the queen who, pleasingly, was "Queen Right" and we even saw her laying eggs. However, the hive was still quite small so we reduced the size of the hive area with added insulation to keep the brood nest warm.



Frame feeder

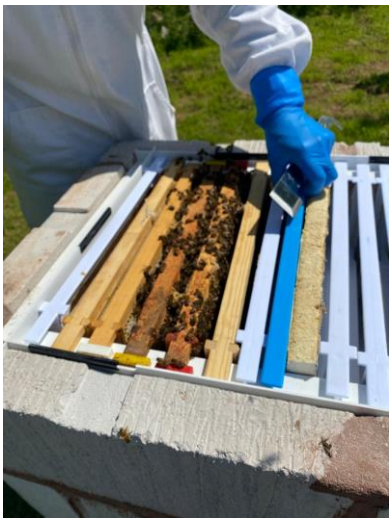
Inspection 4. 12 Jul 23

On our fourth inspection, we discovered that the bees had enjoyed the frame feeder. The contents were reduced by over half and there were no drowned bees evident (the tip about the netting worked). However, there was still no comb beyond the foundation on the wooden frames or on the Zest frames; although there was evidence of drawing-out on the frames in use. We saw the queen and commented that the bees seemed really placid and good natured. On this occasion, we added some additional frames consisting a frame each of brood, stores and pollen from various hives that had been prepared for Basic Exams; and provided another opportunity to bolster our colony.



Colony 1 with (from L to R) an insulating partition, a white Zest frame,
6 national frames, and the frame feeder.

The Zest hive has the ability to house two colonies simultaneously, and on this occasion, a new colony was created on the other half of the Zest hive. The bees and frames came from a nuc that was originally for sale, but the Queen had disappeared. To remedy the Queenless colony, a Queen Cell from hive 3 was transferred to create Zest Colony 2. Having learned from our experiences with the first colony, we reduced the hive volume available and, to minimize temperature differences, we ensured insulation was in place and set the doors to minimal closure. Only one zest frame was placed next to the traditional wooden frames for a slow conversion from wood to Zest. We will monitor Colony 2 to ensure the Queen hatches and mates and that the bees get enough food; we will probably need a second frame feeder.



Colony 2 with (from L to R) white Zest frame 5 national frames, a white Zest frame,
insulating partition, and an insulation block.

Inspection 5. 19 Jul 23

Colony 1 (the original colony). Success!! During today's inspection we discovered that the bees had started to build comb under the National frames. This was exactly what we had been waiting for and meant we could start the transition to Zest frames via nationals. We removed an insulating frame from the outside of the brood nest and replaced it with a Zest frame. Then we inserted a Zest frame in the middle of the 6 wooden frames in situ. We added spacers to the Zest frames so that they would not stick to the wooden frames once comb construction was underway. To help the bees draw more comb, we refilled the frame feeder with syrup at a ratio of 1:1; noting that the addition of the netting into the feeder had provided a means of escape for bees and there was no evidence of inadvertent drowning. Finally, we inspected the frames and saw eggs, larvae at all stages and some stores, with some cells that had hatched now filled with pollen. Next time we hope to see the Zest frames starting to fill with comb. If they are, we can then start to move wooden frames beyond a queen excluder and replace with Zest frames as part of transition as detailed in the Zest guidelines.

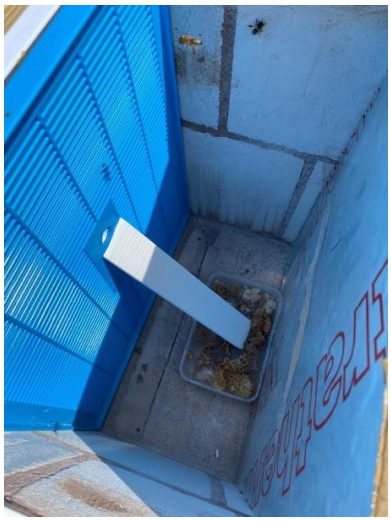
Success – own grown comb

Colony 2. We were expecting to find a hatched Queen Cell and maybe the Virgin Queen. On inspection, the colony seemed quite buoyant, if a little more aggressive than Colony 1; which has always been a relaxed group of bees. We found a hatched Queen Cell so thought half-the-battle was won and that we would just have to look hard for the Queen. However, two more frames into the inspection, we found another Queen Cell; this time unhatched. We are not sure what has happened to the previous occupant of the first Queen Cell; and whether she was in the hive. The existence of a new Queen Cell leads us to believe that maybe the Queen has hatched, but expired. The new Queen Cell will act as insurance and, even if the queen from the first cell is still in the hive, we will end up with a colony that has one Queen once the two have sorted out who's boss. The remaining frames all looked good with stores and some capped and uncapped larvae; a result of them coming from other hives last week.

Hatched Queen Cell

Charged Queen Cell

We did not have another frame feeder for these bees so, learning lessons from previously, we set up an internal feeder, but placed comb in the syrup rather than stones. It was hoped that the smell of the wax would draw the bees to the food and would to stop them drowning by providing a platform to stand on. Finally, we opened the third entrance to this hive; partly because it was there but unused so the hive was not getting the benefit of the ventilation it provides. We set it with enough room for one bee to pass so that it could be guarded; particularly prudent with a prevalence of robbing at present. At the next inspection, we hope to see the Queen Cell has hatched, maybe catch sight of the Virgin Queen, identify if the bees have found the internal feeder, and view evidence of comb being built either under the wooden frame or on a Zest frame.



Internal feeder with comb