

## Insulated Cover Boards

(By Wally Shaw, Anglesey BKA)

When I started beekeeping in 1987 I had two beekeeping books on the bookshelf. I have no idea where they came from, if I bought them or someone gave them to me. One of these was **Beekeeping** by Frank Vernon and was published in the well-known Teach Yourself series. It was first published in 1976 with a second edition in 1986, which is what I had, so I think I must have bought it in anticipation of starting beekeeping.

Frank Vernon was very keen on providing top-ventilation for wintering bees to prevent moisture building-up in the hive – as happens all too easily on solid floors. He was also insistent that condensation water should not drip from the cover board onto the cluster and, to avoid this happening, top ventilation should be peripheral (round the edge). He recommended that the central hole (or holes) in the cover board should be blocked and matchsticks inserted under the edge of the board to give the required ventilation. This is an old idea that appears in many bee books. He then went on to describe a more elegant solution to the problem which was called the perimeter ventilated inner cover. This piece of equipment had been designed some years before by Capt. J. (Jack) Tredwell who was the county beekeeping instructor for Hampshire – he also designed other innovative equipment. Tredwell called his design the New Standard Cover Board. Well, it never lived up to that name but I think it should have.

At the time I read Vernon's book I was busy making my first set of beekeeping equipment and this design of tray cover board appealed to me so I decided to at least make it my `standard` cover board. Figure 1 shows the Tredwell design. I later reasoned that peripheral ventilation combined with top insulation might give still better conditions for over-wintering bees. So, for the winter only, I covered the four peripheral holes with mesh and inserted a sheet of 25mm expanded polystyrene insulation (`Jablite`) into the tray. The insulation had matching ventilation holes cut in it and the mesh was there just to stop the bees chewing the polystyrene which, left unprotected, they destroy with great enthusiasm.

I successfully over-wintered bees like that for about 10 years then along came Varroa! After 3 years of conventional Varroa control using pyrethroid strips, in 2001 I decided that now was the time to find out about other methods of control, whilst there was still a Plan B (pyrethroids) to turn to if the alternatives did not work well. `Apiguard` (my chosen alternative) needed space in the hives to put the trays of thymol gel so that they could evaporate freely and bees could have access to them. Using the tray cover board upside down with the 25mm space above the frames was a ready-made solution, so that is what I did in the first year.

Then I realised that warmth in the hive was obviously an important factor with `Apiguard`, which is said to work best at an (outside) temperatures of 15°C or over. There are often many days in late August and September when the temperature is lower than this so I reasoned that top insulation might help mitigate any climatic shortcomings. Now it would need to be top insulation with **NO** top ventilation because I wanted to retain the thymol vapour. To achieve this, the tray cover board was kept the right way up, the ventilation holes in the insulation were plugged and I made mini-ekes (25mm spacers) to accommodate the `Apiguard`.

Outside temperature obviously does influence evaporation of `Apiguard` but inside the hive, the number of bees present controls temperature, how active they are, the insulation and the ventilation. The beekeeper can control insulation and ventilation and that will promote activity which will, itself, create heat and raise the temperature. What we cannot easily do is control the number of bees. Colony size with the Northern Dark bee (***Apis mellifera mellifera***) tends to decline quite rapidly in the late summer and autumn as the summer bees die off. In the period from the middle of August to the middle of September the number of bees often halves (naturally). Having a small winter colony is part of Dark bees` thriftiness but it does mean that late use of temperature-sensitive treatment materials, i.e. those that evaporate and work as a vapour, is problematic.

Although I had experimented with open-mesh floors (Varroa floors) prior to 2001, this was the first year that I had them on all hives. Previous experience had already convinced me that the bees came to no harm (and, indeed, were probably better off) on open-mesh floors that were open throughout the winter, i.e. no catch tray in place. However, if you are going to inflict this apparently harsh regime on the bees, good top insulation and no top ventilation is advisable. Catch trays are only in place in my hives during Varroa treatment – to help retain the thymol vapour and estimate the mite fall treatment - and removed at all other times of the year. I do sometimes relent and install a tray for small colonies in the period from January until the weather improves in May – but I am not convinced that it is of any real benefit. Top insulation in the spring gives warmth at the top of the hive encourages a high position for the start of the brood-nest. A brood-nest spreading down is more satisfactory than one spreading up because it minimises the storage of honey in the brood combs – the queen can lay in all the brood combs. Later, with the insulation removed, the peripheral ventilation cover board enables a good convective airflow that helps the bees remove water from the nectar.

The combination of open-mesh floor, mini-eke and insulated tray cover board gives me the complete set of equipment for round the year beekeeping. But us beekeepers are a mean lot and I can hear you all thinking `but I have already got a complete set of cover boards and here is this idiot suggesting I change over to tray cover boards!` No problem, just make a few more mini-ekes, drill a vertical hole in the middle of two sides and screw it to your existing cover board for the winter. This converts the ordinary cover board to a tray in which the insulation can be put. All you have to do for winter is cover any holes so the bees can not chew the insulation and buy, beg, borrow or steal some insulation sheet and cut it to size. `Jablite` is readily available from builder`s merchants and reasonably cheap - which is what I use. Better still, but more expensive, is polyurethane insulation board with aluminium foil facing on both sides – this is more robust and does not need protection from the bees. While we are on this economy theme, the mini-eke also has other uses in beekeeping. Place one on top of your clearer board and the extra space will enhance the efficiency of the Porter escapes – better clearance of bees from your supers. Some contact feeders are just too tall to fit inside a shallow box (they need a deep box) and the mini-eke can be used to provide that vital bit of extra height so the roof fits properly and keeps the feeding box warm.

So what I am really suggesting here is that you make yourself a set of mini-ekes (2 for each hive) and they can be used to:-

- Provide space in the hive for `Apiguard` treatment,
- Convert an ordinary cover board into a tray cover board in which you can place insulation,
- Enhance clearer board performance, and
- Provide extra space to accommodate contact feeders

The rumours about the `unreliability` of `Apiguard` are, I am sure, mostly caused by lack of attention to detail; **NOT** reducing the hive to minimum volume, **NOT** controlling ventilation, **NOT** providing top insulation and **NOT** having provision for putting `Apiguard` in the right place within the hive. Unfortunately, many commercially available open-mesh floors are poorly designed and, even with the catch tray in place, provide too much bottom ventilation during treatment. With a little thought and ingenuity most of these faults can be rectified. Well-made mini-ekes will last you for years so it is worth making some sort of joint at the corners – vertical or horizontal lap joints or, better still, an open mortise – and using a waterproof glue. They are inherently fragile objects and it is no use finding them broken when you need to use them.

## Design of Tray Cover Board

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