

## **BUILDING OPEN MESH FLOORS – by Graham White**

At a recent workshop of Alnwick Beekeepers led by a North of England Bee Inspector we were strongly advised to adopt about **Open Mesh Floors** (OMFs). The reason was simple: there is a natural varroa-drop in any hive which can reduce varroa populations considerably over a season. If you have open mesh floors, the mites fall through the mesh and die. If you have solid wooden floors, the fallen mites just wait a while then hitch a ride on a passing bee back up into the brood nest.

I have five National 14" by 12" hives and one Dartington Long Deep Hive; of these, only the Dartington Hive was designed and constructed with an integral open mesh floor. This hive has consistently been the most vigorous and productive; it has always come through the winter with the most brood in Spring. It has never suffered mouldy-pollen combs in winter or chalk-brood in Spring, while the National hives with wooden floors have. I am convinced that this is due to the better ventilation, temperature and humidity control which results from open mesh floors. Hive debris, waste-pollen and varroa mites tend to drop straight through the floor, making for a cleaner hive. Dead bees are dragged out through the 8mm entrance slot. My experience over 3 years is that bees do not suffer in any way from using open mesh floors all year round. Winter survival has been far better; Spring build up-has been very good and honey crop has been best of all my hives.

If you would like to see how I built my Dartington Long Deep Hive go to the website at: <http://www.dartingtonhive.co.uk/>

### **Improved Ventilation and Humidity Control**

All of my National Hives had varroa-floor inserts above solid wood floors, but these restrict ventilation far more than an open mesh floor. An open-mesh-floor could have a ventilation-area of 18" by 18" , totalling 324 square inches; in practice it will be less - about 250 square inches allowing for struts and battens. By contrast, a varroa floor insert above a wooden floor will only allow air through the hive entrance – which is ½" high by 18 inches wide – a mere 9 square inches. That is a huge difference in air supply and humidity flow.

I decided to construct open mesh floors for my four National hives. Buying these commercially would cost anything from £18 - £40 each. Using DIY the total cost was less than £30 for four floors – a unit cost of about £7.

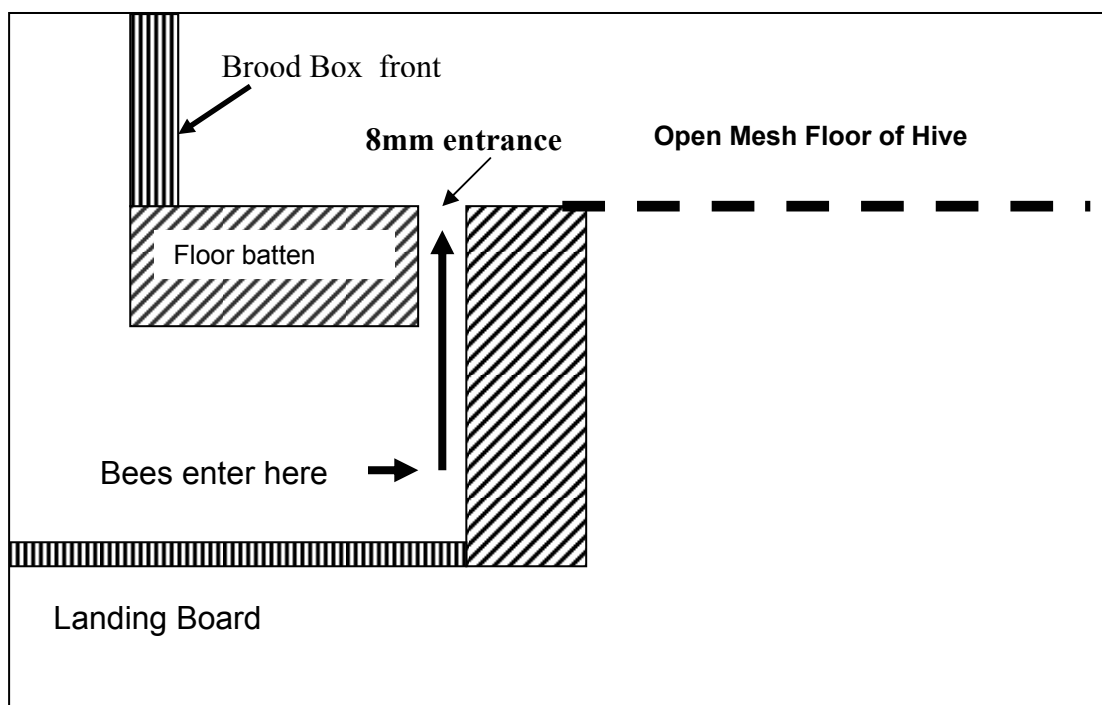
A local building supplier offers planed, external timber and I bought two 4.2 metre lengths of 3.5" x 1.5" timber and two lengths of 2.5" x 1.5" timber for just £14 including VAT. Metal floor mesh from bee equipment suppliers can cost up to £5 per hive; but I was able to get some galvanized metal mesh off-cuts from Stamfordham Ltd in Northumberland for a couple of pounds each. The mesh for four hives cost me £8. The entire cost to build four national-hive floors was about £6 each.

### **'DARTINGTON – INSPIRED' UNDERFLOOR ENTRANCE**

I was impressed by the under-floor entrance used in the Dartington design, and built my mesh floors on this principle. Under-floor entrances are not a new idea; this design was widely used up to the 1950s but a slot in a solid wooden floor can easily be blocked by wax debris and dead bees. In the Dartington mesh-floor-design the under-floor entrance gives the bees access at about frame three- and the bees keep it completely clear of debris. In contrast, even if I left my National hive entrances wide-open in winter, I usually found mouldy pollen, wax debris and damp floors on first spring-inspection. This never happens with an open mesh floor and an under floor entrance.

## HOW DOES AN UNDERFLOOR ENTRANCE WORK?

The bees fly into a recessed vestibule which is a sheltered space about four inches deep and three inches high, running the full width of the hive. They walk across the landing board and climb the rear vestibule wall to enter the hive through an 8mm wide vertical slot that runs the full width of the mesh floor between frames two and three.



The advantages of this are that:

- No wind, draughts or rain can blow directly into the hive front
- No mouse-guard is needed; mice cannot climb through the narrow 8mm slot
- Wasps and robber-bees have a hard time getting in; they have to pass the guard-bees on the landing board and more guards above the vertical slot entrance.
- A simple wooden block closes the hive completely for moving or robbing-control
- No ventilation screen is needed when moving the beehive.

## MAKING THE FLOOR.

Use fine handsaw or tablesaw to cut:

2 Side pieces: 18" (460mm) lengths of 3.5" x 1.5" wood

1 Front floor batten: 15" x 3.5" x 1.5"

1 Front Under floor support/ entrance batten: 15" x 2.5" x 1.5"

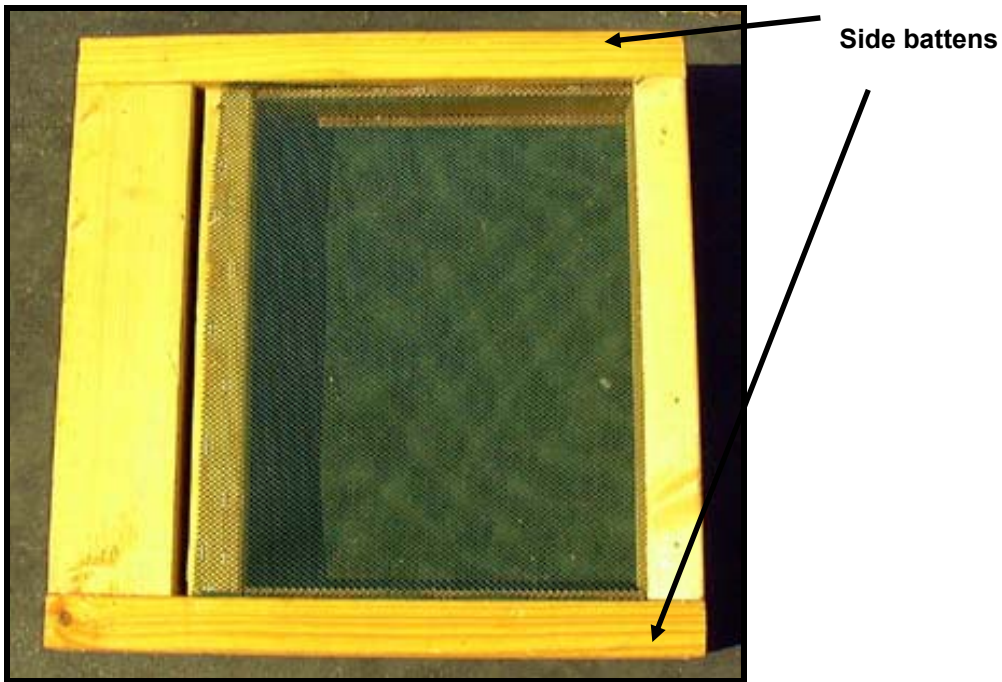
1 Rear floor batten 15" x 2.5" x 1.5"

Expanded metal mesh cut to size and stapled.

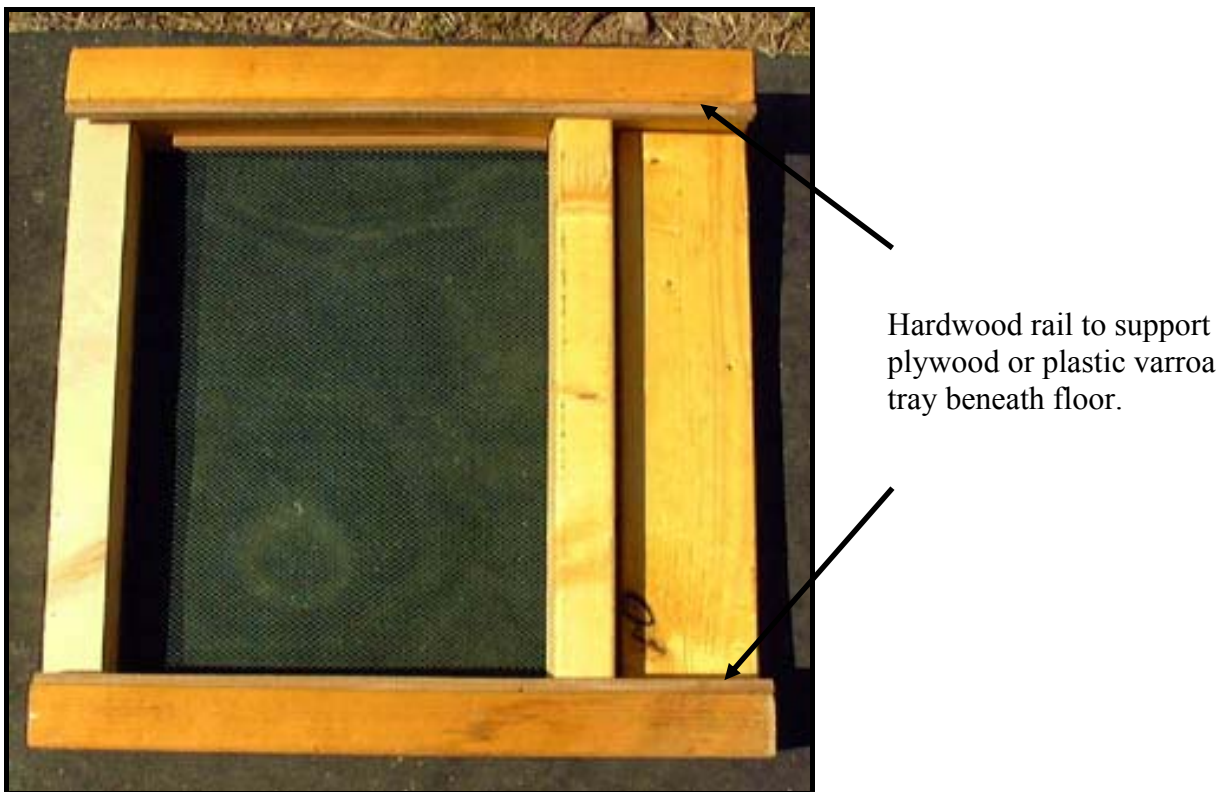
Two small wooden rails – about 3/8 x 18" long – rails for varroa monitoring tray

I used an electric drill to bore nail holes and then glued and nailed the pieces together. Gave all exposed surfaces two coats of **Cuprinol Clear Timber Preserver** – which contains Zinc Acetepac as fungicide, but has no insecticides and is safe for bees.

**PHOTOGRAPHS:**



**Figure 1: Open Mesh National Floor Top View**



**Figure 2: Open Mesh Floor Bottom View**

You can just see two hardwood rails which allow a monitoring tray to be inserted under the mesh floor when checking for



**Figure 3: Entrance lobby with landing board**



**Figure 4: 8mm wide entrance slot: seen from above**

Here you can see the view from 'inside' the hive if you were looking down through the frames onto the floor. Bees climb up through the 8mm wide slot visible in this picture and enter the hive at about the frame 3 position.

## **CONCLUSION**

Transferring the bees from the old floors to the new took just a few minutes for each hive and within ten minutes they had adjusted to the new entrance. We have had very hot weather over that week with temperatures reaching 30 degrees C and combs were distinctly soft when examined. As soon as the mesh floors were in place it was evident that the temperature and humidity within each hive dropped considerably and the bees could control temperature with far less effort and stress. It is a simple matter to slide varroa monitoring trays under the hive whenever they are needed; however, they will not be left in place during the summer. I may leave them in place during the winter to minimise draughts, though this has not been necessary with the Dartington Long Deep Hive.

## **POSTSCRIPT – MAKING VARROA MONITORING TRAYS**

I could not decide whether to make varroa trays from plywood or some other material. Then I recalled that graphic arts companies make interpretation signboards from rigid or semi rigid plastic sheets that would not suffer from rain or damp. I visited a local company and they showed me samples of a 5mm thick plastic exhibition board called **FOAMEX**. This is widely used by any company that makes signboards and is 'industry standard'. It is a tough but flexible board available in various thicknesses. It is impervious to water, stiff but bendable and easily cut with a Stanley knife or craft knife. They had a large bin full of offcuts which they happily gave me for free. So total cost of five varroa monitoring trays was – a couple of jars of honey.

For further information contact:

Graham White  
3 Oxenrig Farm Cottages  
Coldstream  
TD12 4EY  
01890 882 713  
[gw@broxmouth.freeserve.co.uk](mailto:gw@broxmouth.freeserve.co.uk)