

“In the Beekeeper’s Work Shop”

10 Minute Projects: Queen Introduction Cage

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Queen Introduction Cage

One of the first skill required by new beekeepers is how to introduce a queen to a colony of honey bees. If you start with a package of bees, then you will face this job up front. If you start with a captured swarm, then you will probably be advised at some point to requeen. Even in established colonies, you will most likely have to requeen sooner or later.

Strategies for requeening range from benign neglect (letting the bees take care of the requeening issue themselves) to something a bit more purposeful (removing the old and introducing a new queen).

For those who take the more deliberate route there are two basic requirements that must be met in order to successfully requeen a colony. First, conditions within the hive must be such that the colony recognizes the need for a new queen. Second, the new queen must be introduced in a manner such that the colony will accept her as the queen for their colony. Today’s project in the beekeeper’s work shop is making a simple introduction cage that can be used to address this second task.

The queen introduction cage, sometimes called a push in cage, is a simple, small rectangular wire mesh box that is pushed into the comb in order to confine the queen (Figure 1). By confining the queen to a small section on a frame, you give the colony the opportunity to get used to the distinctive odor (chemical signatures) of the new queen. In an introduction cage, the new queen has a bit of space to run around in and the workers have the opportunity to feed the queen through the screen (trophallaxis). This transfer of food from the work-

ers to the queen is how the queen passes on her mandibular gland secretions (pheromones) to the workers and establishes her “queenship” of the colony.

Using An Introduction Cage

An introduction cage can be used to introduce either a mated or virgin queen. With a mated queen, the cage is usually pushed into a section a comb that has open cells immediately adjacent to an active brood area. This gives the new queen the opportunity to start laying eggs and when that happens the colony will invariably accept the new queen.

With a virgin queen, the introduction cage can be pushed into a section that has about to emerge brood. The new brood, of course, will accept the queen since she is the only queen they have known. Also, the nurse bees will be busy feeding the hatching brood and increases their contact with the new queen. This also promotes acceptance.

If introducing a grafted queen (a queen that is still in the queen cell and not yet emerged), put the cell inside an introduction cage a day or two before emergence. This gives you the opportunity to remove the old queen and establish the “queenless” condition that the colony needs in order to accept the about-to-hatch new queen. Once the new queen is out and about, release her. The virgin queen will mate and about 10 days later (maybe a few days more) you should start to see evidence of a successfully introduced queen (eggs and young larva).

An introduction cage can also be used to protect a natu-



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rally produced queen cell when the colony is superceding the old queen. Simply push in the cage around the sealed queen cell(s). If you do this for a couple of queen cells in the same colony, you can prevent the first emerging queen going around and killing her yet-to-emerge rivals. That way, you can harvest the extra queen(s) for use elsewhere.

Tip: You might find pushing in the cage a bit hard, particularly on old darkened brood comb that has been stiffened up by layers of larval skin. Simply use the flat end of your hive tool, or a pocket knife, to pre-cut the comb along the edges of the cage. The cage will then push in quite easily.

Basic Construction

The push-in style queen introduction cage is simplicity itself. All you need is a small rectangular piece of #8 hardware cloth (Figure 2). The size is not crucial; a finished size of 3 inches square works quite well. The sides of the cage should be somewhere in the 5/8 to 3/4 inch range. This gives you

enough wire to work with when pushing the cage into drawn comb. You need at least 3/8 inch space inside the comb for the queen to move about and 1/2 may be even better.

You will bend the tab from one side of the wire mesh around to form the corner. To keep the corners from coming undone, use a very small piece of soft wire to hold the tab in place. These plans call for a bit of solder on the corner tabs to seal the deal. A soldered corner is a bit more elegant.

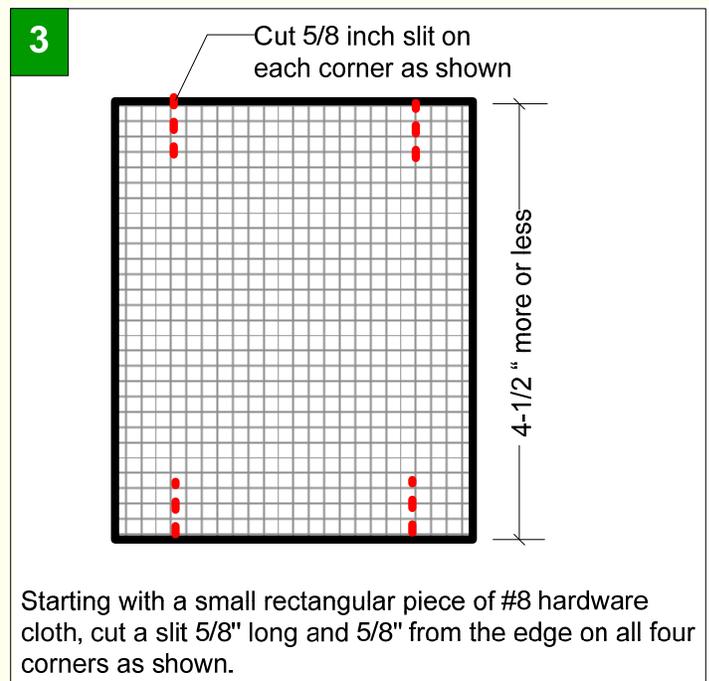
Construction Details

Step 1. Cut the Hardware Cloth to Size

Cut a rectangular piece from #8 hardware cloth (Figure 3). The size is not particularly important; a 4 inch by 4 inch square is a good size.

The sides of the introduction cage need to be big enough so that about 3/8 inch of the cage is above the wax comb after you have it pushed in. You might start with sides 5/8 inch wide which will give you about 1/4 inch pushed into the comb.

For a 5/8 inch side cut the hardware cloth 5/8 inch from the corner and 5/8 inch long (this is 5 squares in and 5 squares long). Make four such cuts as shown in Figure 3.



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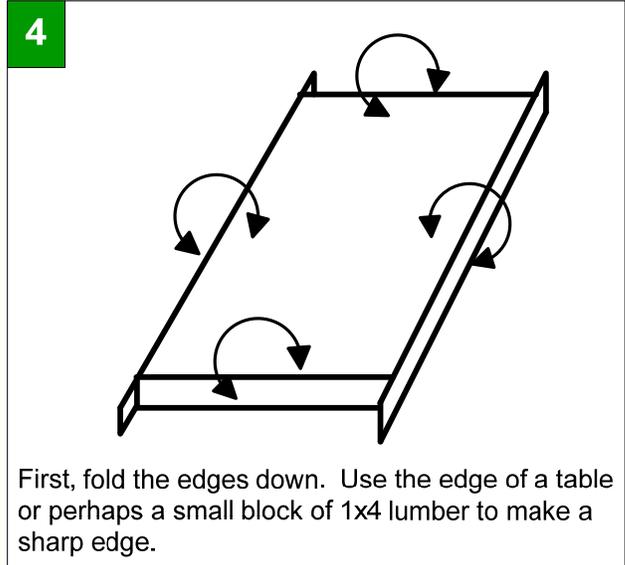
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Construction Details

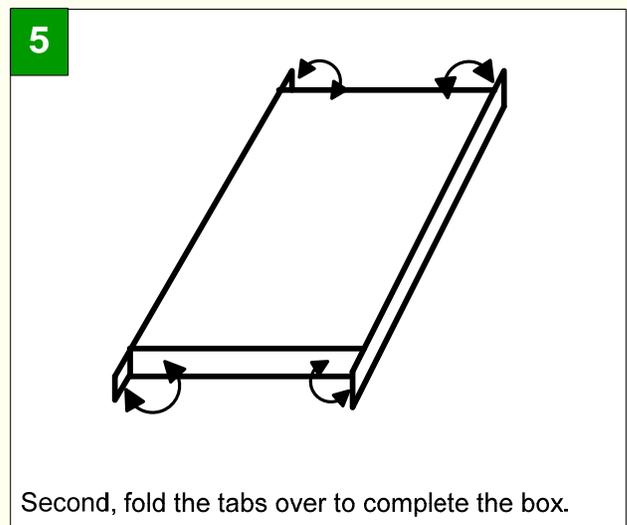
Step 2. Bend the Four Edges to Form Cage

Bend the edge of the mesh over to make the four sides (Figure 4). You want a good, sharp bend. Use the edge of your workbench, a hand seamer (see photo gallery) or perhaps a small block of 1x4 wood to make the bends.



Step 3. Bend the Tabs to Complete Cage

To complete the cage, bend the tab on each corner as shown (Figure 5).



Apiary Tip

To install the introduction cage, it sometimes helps to cut the comb (using a pocket knife or your hive tool) along the edges of the cage. This is particularly the case with older darker comb. The cage can then be pushed into the comb with minimal damage to adjacent comb or the cage.

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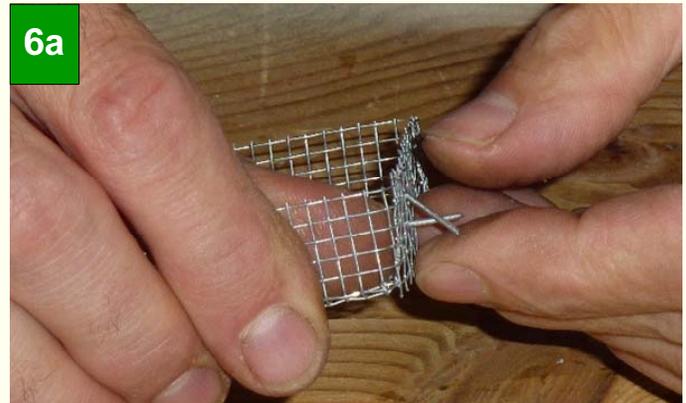
Step 4. Wire or Solder Tabs Securely

Use a short piece of light wire to keep the corners together (Figure 6a). 18 gauge aluminum wire works well since it is soft and easy to work with. You can also use an office paper stapler.

I prefer to use a small dab of solder on each corner in addition to the wire. The solder binds the overlaying wire mesh together and is quite strong.

Use leadless solder (available in any hardware store). Before soldering, put a dab of flux on the spot to be soldered (Figure 6b). The flux will draw the solder into the mesh and bind the layers together. Without flux, the solder will bead up on the top and not bind the mesh. Some solder has a flux core so you don't have to apply flux separately.

The trick with soldering is to allow your soldering iron to get good and hot. Touch the coil of solder to the iron to pick up a small drop of solder - it doesn't take much - and then touch the cage mesh where you have the flux (Figure 6c). The solder should flow into the wires of the mesh. Check the inside of the cage to make sure that you have soldered both sides of the mesh together.



Resources

A video of this project can be found on Youtube at...
www.youtube.com/user/beekeepersworkshop

"Building a Bee Hive" series. Published on-line at
www.michiganbees.org/beekeeping/in-the-beekeeper's-workshop. For other beekeeper's workshop project plans, search for "workshop".

Other plans in the "10 Minute Projects" series include...

- * Queen Cell Protector Cage
- * Queen Introduction Cage
- * Queen Marking Cup
- * Hive Ventilation Screen

These plans can be found on the michiganbees.org web site referenced above.

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List of Materials: Queen Introduction Cage

HARDWARE

#8 hardware cloth (size not important, at least a 4" x 4" piece)
fine wire (18 gauge aluminum)
solder and soldering flux

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Photo Gallery...



Photo Captions:

1. Using a hand seamer to bend cage edge.
2. Using a wood block to bend cage edge. The wood block can be used for edges too small to use hand seamer.
3. Bending tabs to complete cage.
4. Three cages and the tools used to make them.
5. Two introduction cages (for comparison) installed on a medium frame from a bee hive.