

by Jerry Borger

**M**y wife and I moved to a rural area of southwest Virginia in 2004, where we live on the side of a mountain. It's pretty much all woodlands for at least a half mile in every direction. Having planted a dozen young fruit trees on the property a couple years before we moved there, I wondered in late 2005 if there would be any bees around to pollinate the fruit blossoms the trees eventually produced. "Hmm," I thought, "maybe I should get a couple hives of honey bees."

And thus began my sojourn into beekeeping. Knowing absolutely nothing about honey bees, I attended my first beekeepers' association meeting in February 2006. A video on "re-queening" was shown. Who knew "queen" could be a verb?! I seem to remember nine different commercial beekeepers in the video, each one absolutely certain their method of re-queening was the only right one. A couple of them even agreed with each other. I left the meeting skeptical and confused, but impressed with the notion that it's very important to maintain hives with young, healthy queens.

At a meeting a few months later a guest speaker, Bill Whitlow, gave a presentation on how some of his practices differed from mainstream beekeeping. One that caught my eye was how he used a double screen board (see graphic) to, among other things, produce queens without grafting. Understanding little of what he

was saying, I furiously took a page and a half of notes before my eyes rolled back in my head and I gave up.

A year or so later I had the opportunity to hear Bill describe the technique again. This time I was able to follow what he said and took more complete notes. Based on my experiences since then, which includes teaching our association's Beginning Beekeeper's Course for the past eight years, I would not recommend first year beekeepers try this. It's not that it's difficult or overly complicated, but a first year beekeeper is already "drinking from a fire hose," attempting to absorb a huge amount of beekeeping information. So, beginners, read this, make a mental note to revisit it next year, and concentrate on learning to care for your bees this year. The rest of you are about to grab a new fire hose!

What tempted me most to try this procedure is the threefold purpose: to minimize the swarming urge by putting the bulk of the nurse bees "upstairs," away from the queen during a prime part of swarm season; to maximize honey reserves by not having to use as much nectar/honey to feed brood and nurse bees; and to encourage the upstairs bees to start queen cells to keep the line of a good queen going, all without taking a hive out of production. This sounded mighty good to me!

While it borrows aspects from other methods that have been around for quite a while, I haven't read or heard

about this particular means for hobbyists to raise up to a dozen or so queens without grafting, and wanted to share it with readers. It's a bit on the labor-intensive side, but it's relatively cheap and quite effective.

I have distilled the essence of the technique to one written page and two diagrams (see sidebar). It explains how hobbyist beekeepers can harness the emergency queen rearing process to produce a handful of queens without grafting. Okay, maybe it's not crystal clear—it'll probably take a couple of read-throughs—but all the details are there. Best of all it works. I've used this method for many years with excellent results.

#### WHY DOES THIS WORK?

In the spring, when honey bee populations grow rapidly, nurse bees are apt to prepare for swarming by producing queen cells. While not all aspects of swarming are completely understood, I remember reading, although I can't give proper attribution,



*Prevent swarming by harvesting that energy of the bees. .*

that one of the triggers for swarm cell production is the queen's pheromone is too faint. When a colony becomes overcrowded, her pheromone, which is spread bee-to-bee from the queen's attendant retinue to other hive bees, no longer appears strong, as it's spread too thinly among the over-flowing population.

We can harvest this swarm drive, if we start with a strong, well-fed hive during a spring nectar flow. Now to keep them from swarming, we isolate most of the nurse bees away from the queen. Far removed from the queen, these young bees feel queenless and pour their resources into raising large queen cells from young worker brood, providing them with lots of royal jelly.

If you do this procedure using the open brood of a colony with desirable traits, her daughter queens are likely to have some similar traits, though the local drone population naturally influences the new colony's disposition. Remember these are emergency queens, so you need a really populous colony to make sure they are of decent quality.

#### WHAT DO YOU NEED?

In applying this technique, it helps greatly to have a spare hive body and a couple towels or other hive covers on hand. Throughout your frame examinations, look closely for the queen; she **must** be positively identified and carefully placed in the lower hive body. The description below assumes a configuration of two hive bodies with optional honey super(s) above. It can easily be modified for other configurations, though all of your brood frames need to be the same size.

You will need:

- 1 extra hive body of the same depth as your brood frames
- 2-3 extra hive covers or towels to minimize robbing
- A double screen
- A couple of nuc boxes or a queen castle
- The ability to find the queen

#### COLONY SET-UP

Begin by removing any honey supers from your chosen hive and set them aside. Cover them with a towel or other cover to help keep the bees calm. Next, remove the upper hive body and set it beside your spare hive body on a top cover or other flat surface on the ground.



*Several emergency cells can be seen in this photo. Notice how the bees draw them out from a worker cell, rerouting the development into a queen trajectory.*

Examine the frames that are in the upper hive body, retaining any with significant amounts of eggs, larvae, or pollen, and putting those with lots of honey/nectar, capped brood, or empty cells in the spare hive body. (Hint: Frames are often a mix of different aged brood and resources. Put those that clearly do not belong in the upper hive body on one side of the spare hive body, and the questionable ones with mixed resources on the other side. You can decide later when you're finishing out the frames in each hive body where you want those questionable ones to end up.) If the bees get a bit agitated, cover the spare and upper hive bodies with a towel or other hive cover as you continue working.

Next, evaluate frames that are in the lower hive body, retaining any with lots of honey/nectar, capped brood, or empty cells, and putting those with significant amounts of eggs, larvae, or pollen in the upper hive body. Questionable frames can go in the spare hive body.

Finally, transfer appropriate frames from the spare hive body to the upper and lower hive bodies as they best fit. It's very unlikely, particularly at this first session, which I call "week 0," for the frames to be perfectly divided so that exactly 50% of the frames have all the eggs, larvae and pollen, and the other 50% have all the capped brood, empty cells, and honey/nectar. That's OK, lots of frames will contain multiple materials; just give it your best shot based on the predominant contents of each frame. Don't

worry about shaking any bees into one hive body or the other; you'll see why shortly.

If you didn't see the queen, I recommend you go back and look for her; she **must** be positively identified and carefully placed in the lower hive body, or you'll set your efforts back by a week at minimum. Don't forget to look in any honey supers you might have removed.

Now, for hive configuration. Place your lower hive body (the one with frames of predominantly honey/nectar, capped brood, and empty cells) on top of a bottom board. If you have one or more honey supers the bees have been working, put them on next; a queen excluder below the honey supers is optional, but highly recommended as otherwise the queen will often move up into the honey supers. Next put the double screen board on top of the honey supers, if any are present. If not, place the double screen directly above the lower hive body.

Open one of the upper doors in the double screen board, let's arbitrarily say the one on the left. Place the upper hive body (the one with frames of predominantly eggs, larvae and pollen) above the double screen board. Add a hive top feeder, fill with syrup, and replace the top cover. The configuration is complete.

#### NOW WHAT?

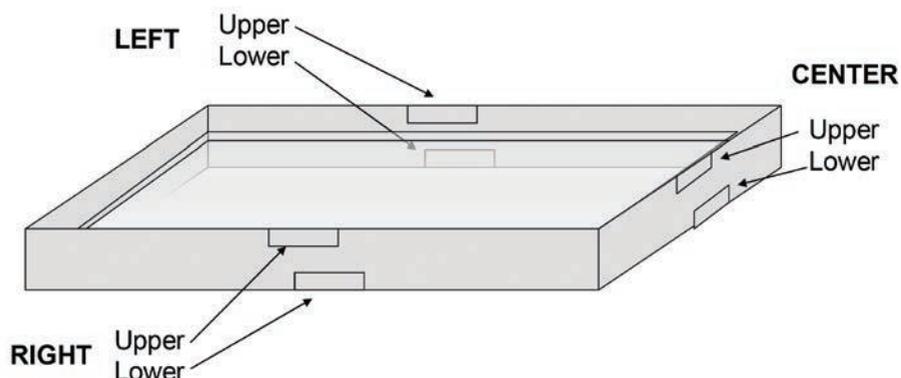
Let's step back and evaluate the results of what you've done. The queen will continue to lay eggs in empty cells in the lower hive body. All the

# HOBBYIST QUEENS USING A DOUBLE SCREEN

## Description:

For use on a strong hive with two hive bodies in the spring or during a nectar flow period. Intent is threefold: to minimize the swarming urge by putting the bulk of the nurse bees “upstairs” away from the queen during a prime part of the swarming season; to maximize honey reserves by not having to use as much nectar/honey to feed brood and nurse bees; and to encourage the upstairs bees to start queen cells to keep the line of a good queen going, all without taking a hive out of production!

## Arbitrarily assign names to Double Screen doors:

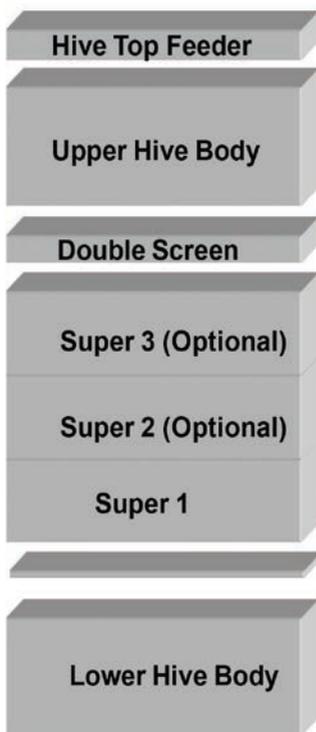


## Procedure:

Separate the upper and lower deeps with a double screen (see figure). Below the double screen and on top of a screened bottom board put the lower hive body. Insert the queen, frames of nectar/honey, empty cells, and capped brood. It's okay to have one or more honey supers above the hive body and below the double screen. I recommend putting a queen excluder below any supers to make it easier to locate the queen on subsequent inspections. Above the double screen put the upper hive body. Insert frames containing all the pollen, larvae, eggs, and nurse bees you can find (it's okay if there is some capped brood on these frames, and it's okay if field bees wind up “upstairs”). Open the left door on the upper half of the double screen for use as an entrance/exit by bees in the upper deep. Close all other double screen doors. You'll need to feed the upper hive body since the population there will shortly have few, if any, forager bees to bring in food.

On a weekly basis, rotate frames of capped brood and empty cells (from where brood has emerged) *without bees* from the upper to lower hive body, and eggs/larvae *plus nurse bees* from the lower to upper hive body (making sure you don't include the queen). Close the open door on the left upper half of the double screen

and open the door immediately below, so that nurse bees who have “graduated” to being forager bees will be re-directed downstairs. Open a new door around the corner on the upper half of the double screen for the next crop of “graduating” nurse bees to exit/enter by. Transfer individual frames containing capped queen cells plus adhering bees to a nuc or queen castle. Replace with frames (and bees if desired) containing honey, pollen, and older brood from other hives. If you backfill with frames of capped brood or drawn but empty comb, put those frames “downstairs” and re-balance frames, as necessary. Repeat next week and continue for as long as you want to produce additional queen cells.



**Start:** Insert frames with eggs, larvae, nurse bees, and pollen (OK if some capped brood mixed in)

**Week 1 and Beyond:** Rotate frames with all capped brood and open cells to lower hive body (no bees)

**Start:** Open left upper door

**Week 1:** Close left upper door, open left lower door; open center upper door

**Week 2:** Close center upper door, open center lower door; open right upper door

**Week 3:** Continue sequence

*As necessary, transfer frames with capped queen cells from upper hive body to a separate box. Replace with anything but eggs or very young larvae from another hive.*

← **Queen Excluder (Optional)**

**Start:** Insert Queen plus frames with capped brood, open cells, and nectar/honey

**Week 1 and Beyond:** Rotate frames with eggs, larvae, and nurse bees to upper hive body

forager bees, even the ones that were relocated “upstairs” will go out foraging and return to the main hive entrance below the lower hive body, because that’s the only entrance they know. With little to no brood to feed, nearly all the nectar the forager bees bring in will be turned into honey reserves in the lower hive body or in the honey supers, if present. The bulk of the nurse bees were on the frames of uncapped brood, which are now in the upper hive body away from the queen. Lots of nurse bees, lots of food resources, lots of uncapped brood in all stages of development, and a dearth of queen pheromone will shortly lead to multiple large, well-fed emergency queen cells.

Initially after reconfiguration you’re unlikely to see any bees returning to the open door on the double screen board. However, after several days some of the older nurse bees in the upper hive body will “graduate” to forager bee status and begin forays for nectar, pollen, water, and propolis. These bees return to the only entrance *they* know, which is the door you opened on the upper side of the double screened board.

#### REPEAT PLEASE

A week after the reconfiguration, “week 1,” you’re going to repeat most of what you did initially. Remove the upper hive body and set it beside your spare hive body on a top cover or other flat surface on the ground. Separate the frames that are in the upper hive body, as you did before, retaining any with significant amounts of uncapped brood and transferring those with predominantly capped brood and/or empty cells, *without bees*, into the spare hive body.

Look carefully for queen cells. If you find any frames with *capped* queen cells, transfer these individual frames plus adhering bees to an empty nucleus hive or queen castle. Supplement the queen cell frame in the nuc or queen castle with frames (and attached bees) containing honey, pollen, and brood from other hives. If a frame has only uncapped queen cells, leave it in the upper hive body another week.

Next, like before, separate frames that are in the lower hive body, retaining any with lots of honey/nectar, capped brood, and empty cells, and putting those with significant amounts of pollen and uncapped brood *plus bees* into the upper hive body. Finally, transfer the frames from



*If you don't know how to graft, but want daughter queens from your good stock, this method will allow you to make higher quality queens than a walk-away split.*

the spare hive body to the lower or upper hive body, balancing them out to get the best combination of the proper number of frames in each hive body.

If you removed frames with queen cells, then as you balance out frames in the upper and lower hive bodies, put the full complement of frames upstairs and insert additional frames with drawn comb or bare foundation (or even frames with capped brood from another hive) downstairs. Again, you **must** positively identify the queen and ensure she stays in the lower hive body.

As you put your hive boxes back together, close the upper door on the double screen board that had been open, and open the door immediately below it. Next open the upper door around the corner; in our example this would be the upper center door of the double screen board.

#### WHY DID WE DO THAT?

Once again, let’s evaluate the results of what you’ve done. No change for the queen—she’ll continue to lay eggs in empty cells in the lower hive body. All the upstairs nurse bees that had graduated to being forager bees will go out foraging and return to the only entrance they know, which was on the left side of the double screen board. However the upper door which led to the upper hive body is now closed. These new forager bees will instead enter the lower double screen board door you just opened less than an inch from their accustomed entrance, which directs them downstairs with the other forager bees.

Meanwhile, upstairs we have the same situation as before: lots of nurse bees, lots of food resources, lots of uncapped brood in all stages of development, and a dearth of queen pheromone which will shortly lead to more large, well-fed queen cells drawn from eggs that initially started out as workers. These are emergency queens, but extremely well fed ones, as we’ve concentrated the nurse bees upstairs.

#### WEEKLY MANIPULATIONS

Repeat for week 2, week 3, etc. until you have harvested all the queen cells you want. When you reach that point, look *very carefully* for additional unwanted queen cells and destroy them, then put everything back in its original, traditional configuration. I strongly recommend closely examining the upper hive body for queen cells again one week later, and then you can revert to your normal inspection schedule. The bees sometimes sneak in a few hard to spot emergency cells.

#### GRAFT FREE QUEENS

While there are no guarantees, if done correctly you’ll likely benefit from quality queens and potentially enhanced honey reserves. An additional benefit is dampening the swarm drive. By separating the nurse bees and allowing them to produce queen cells, and constantly providing the queen below empty space to continue to lay eggs, the bees never felt crowded. The nurse bees can then be reunited with their still strong and productive queen.

That's it! Assuming you already have a hive top feeder, spare hive body, and nuc boxes, the cost is your time and an investment in a double screen board (I found one online from a major bee supplier for about \$23). If you wanted to raise queens, you would have had to make or buy a box or container for each queen anyway, so I won't include that cost as exclusive to this technique. I received a Christmas gift of a deep queen castle (also called a queen rearing hotel and available for about \$45, plus telescoping top cover for about \$24) several years ago. It's basically a hive box with four 2-frame compartments each with an entrance in one of the four faces of the box. A medium version is also available.

I had an absolute ball using the queen castle to raise queens! So much so, that I got a second one the next Christmas and now use both for raising queens in "two-frame mini-nucs" for myself. I also make a few of these available to members of my bee association.

Good luck and I hope this method brings you as much pleasure, and as much bee knowledge, as it has me!

**Jerry Borger** is a Pennsylvanian by birth, spent 28 years in the Air Force, and retired to Virginia in 2004. He began beekeeping in 2006, currently has 11 full-size hives and 10 double-deep nucs, and is a past president of the New River Valley Beekeepers' Association. In addition to raising a few nucs, he also takes honey bees out of buildings, and makes a few beeswax products. Jerry's a big fan of trying new things with his bees, and particularly enjoys "playing" with queen castles.



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