

Beginner to Beginner Queen Rearing

November 7th, 2011 by david laferney [Leave a reply »](#)



You can learn to produce your own queens using this small, but scalable system.

I originally wrote this article in 2011, since then I have continued to keep bees and rear some queens every year. I have tried most of the other popular methods, but this one is still my favorite for the size of my apiary and my needs. As I have learned new things I have incorporated those into this article. So, on with it...

I'm a beginner. This has been my second year raising queens – my third year keeping honey bees. So I am in no way pretending to be any kind of an expert – not only have I made many mistakes, but I expect to make many more next year. As one beginner to another – I think I might have some useful insights into getting started in queen rearing.

I'm going to give several beginner-to-beginner tips in this article. Things that might not be all that helpful to old hands but have really helped me. Here's the first – and I think, best:

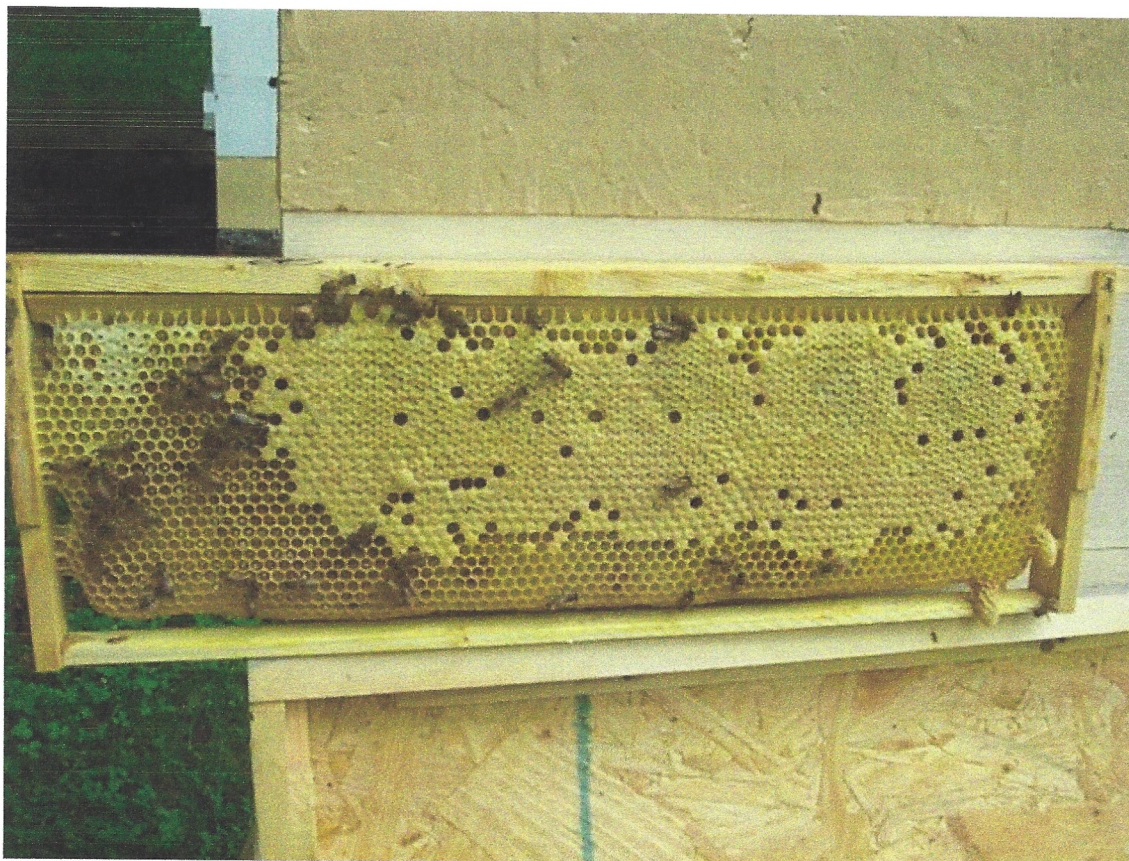
Plan to practice rearing queens when it's easiest – during the main flow/swarm season, that is – late April/Early June in Mid TN – when the bees **want** to reproduce. It can be done earlier and later, but it's a lot more difficult.

The Basic Principle of Honey Bee Queen Rearing

Any queenless hive of honey bees will try to make a new queen if it has the resources to do so. The required resources being 1) larva of an appropriate age 2) food 3) A sufficient number of worker bees 4) Drones – male

bees – that the new queen can mate with. Most of the time such a hive will be successful in requeening itself. The reason this is possible is that the **only** difference between a worker bee and a queen bee is the amount and type of food that they eat during the first few days after hatching from an egg.

So if you want to raise a new queen, all you really have to do is create a hive without a queen which has eggs or very young larva, and let the bees do the rest. This is called a split and it is a fine way to increase the number of hives that you have. And it's exactly what I (mostly) did to go from 1 to 10 hives during my first 2 years.



A frame of foundationless brood with “emergency” queen cells on it. Ever heard that foundationless brood always has lots of drone brood on it? Not when it's drawn in a queen-right mating nuc.

The problem with making a split is that even though your queenless hive will probably make several queen cells only one of them will get a chance to fly out and mate – because the first one to emerge will kill the rest. **And** there is a significant chance that one won't make it home either – many get eaten by predators, lost, or caught in bad weather. So after committing a strong queenless hive to the project for about a month at best you only get one queen – and there's a fair chance that you won't even get one.

Also high quality queens must be fully fed, and immaculately cared for from the time they hatch from the egg – any queenless hive will do what they can with what they have, but you want your queens to be raised under the very best of conditions. And that takes a **lot** of well fed nurse bees – hundreds per each queen.

Queen Rearing – is a process whereby one strong queenless hive produces many well fed/well grown queen cells at the same time, and then before they emerge and kill one another they are each given their own “mating nucleus” hive to emerge into and head up until they are fully mature. Worker cells lay horizontally in the hive –

queen cells hang down vertically in the hive. When nurse bees encounter larva in cells that hang down they tend to treat them as queen cells. This concept is central to most queen rearing methods.

Using such a process one "Mother Queen" with desirable properties can produce many – in some cases thousands – of high quality daughter queens. Or you can use a similar system to produce a dozen or so good queens for your own use. At \$20-\$40 each plus shipping for "store bought" queens you don't need to produce very many for it to make sense. I would like to point out though, that after rearing queens myself a few times I understand why they are so expensive. There is nothing all that hard about it, but there are several steps, and some of them absolutely must be done on a specific schedule.

A few Queen Rearing terms you should know:

Grafting – moving very young worker larva into artificial cell cups. There **are** some graftless ways of producing queens but you will probably want to learn to graft sooner or later, and the thing is – it's way easier than you probably think. It just takes practice. Grafting is pretty much the only way the pros use to produce large numbers of queens.

Cell Starter – An extremely populous – usually queenless – hive that will begin the process of turning worker larva into queen larva.

Cell Finisher – After about 24 hours in the **cell starter** the cells are move into a **finisher** – Another populous (usually queenright) hive which will finish feeding/building the queen cells.

Starter/Finisher – One hive that combines the functions of the starter and finisher. The Joseph Clemens System uses a starter/finisher as does the Cloake system.

Mating Nuc – 10 days after grafting, the cells are removed from the finisher hive and each is put into their own queenless hives – mating nucs – which they will emerge into, and fly out from to mate. After mating the new queen will stay in the mating nuc **at least** until she is laying eggs and fully mature – 3 weeks more or less.

The Joseph Clemens Starter/Finisher System

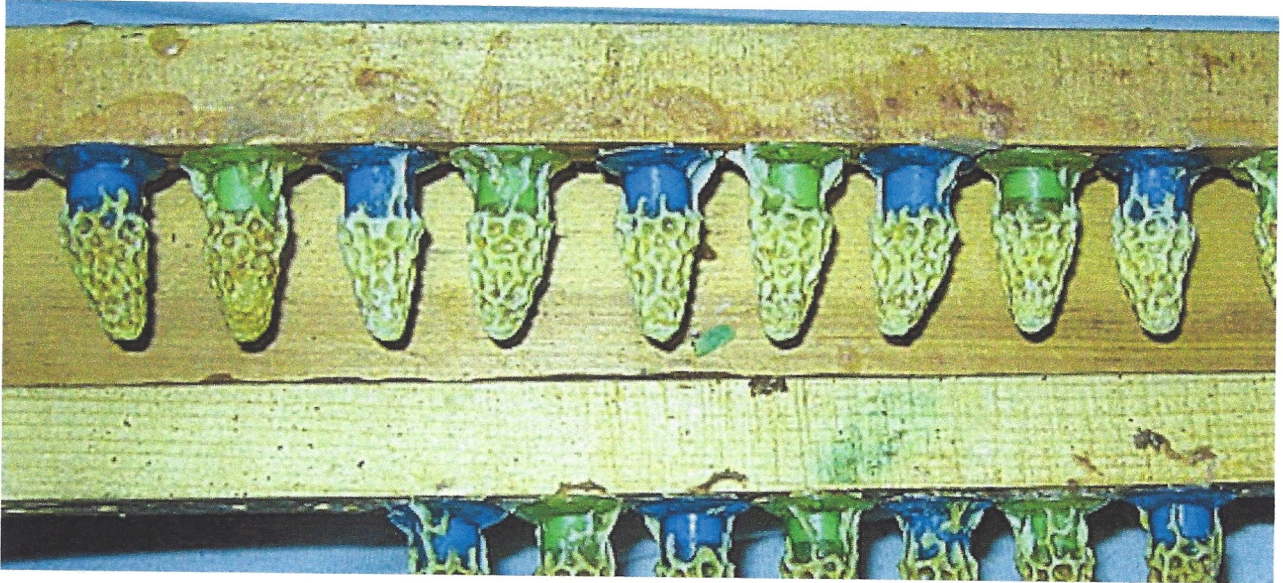
The system that I've been using is what I call the [Joseph Clemens System](#) – because that is where I heard about it from, and because Joseph Clemens has **proven** that it works by producing very large, high quality cells and queens using this system. I have found that it is very well suited for me to produce a fair number of queens while learning skills that can be scaled up to higher production later if desired. It's fun, affordable, and you can use it even if you only have a few hives.

You can use this system over and over throughout the season without having to repopulate the starter/finisher hives, and you can use it just about any time that you want without having to do a lot of prep work – once you get it going. This system also avoids the problem of having to manage a hive that is on the verge of swarming by being Queenless – no matter how strong it is, a hive won't swarm without a queen. When I first read about it, I thought that it sounded like such a hive would develop laying workers or some other problem because of being queenless for an indefinite time. But, because you give it fresh brood about once a week none of those problems crop up – it just gets really strong and stays that way all season long.

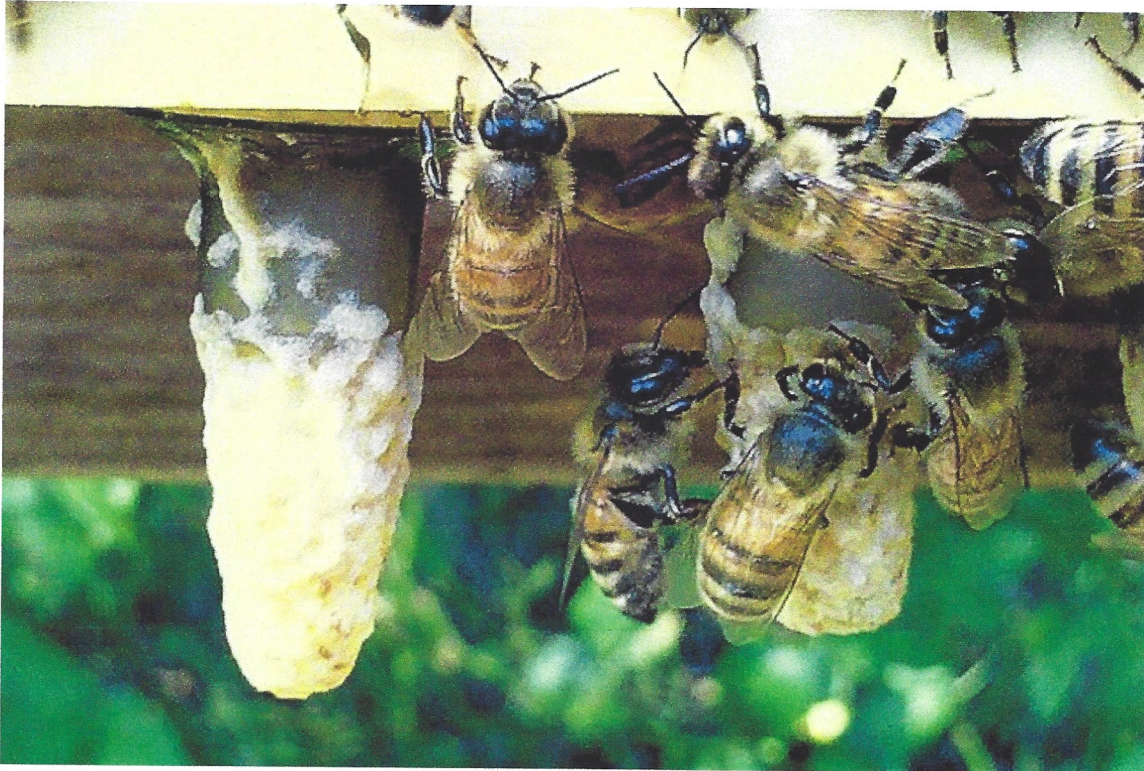
This is not a system that is usually used by bulk queen producers. High volume producers usually use a five gallon bucket full of bees in a specialized swarm box as a cell starter, and another big strong queenright hive that is on the verge of swarming as a finisher – to produce hundreds of cells at a time. Those commercial starters and finishers have to be rebuilt very often. And then once they've produced all those cells they have to put them into an equally large number of mating nucs. The Joseph Clemens method uses a **queenless** five frame nucleus with 4

medium frames of bees and a cell bar as a combined Starter/Finisher and produces 10-20 cells (more or less) at a time – and it can be used all season without having to be rebuilt. As you can imagine this is much more manageable for hobbyists than the way the commercial guys do it.

But, I've seen it written that you can't really produce good cells in such a setup. I present exhibit A:



Joseph Clemons "nice" regular sized cells produced with this method.



One of my best batch of cells using this method. I'm still learning, but next year these will be my "regular" sized cells instead of just the best ones. I hope.



A nice queen – just starting to lay – that I produced this past summer.

As previously mentioned the heart of this system is a five frame nucleus hive (nuc) – which you probably already have. Joseph uses a deep hive body with medium frames, and I've been using a medium hive body with a slatted rack under it – but they probably amount to **about** the same thing. Both of us protect the entrance with a piece of queen excluder to keep rogue queens from taking over the hive.



So, I changed to this setup – from the bottom – Screened bottom board, queen excluder, 5 frame medium hive body. As you can see, this is an extremely populous hive. It's all screwed together so that it can be easily picked up and moved if desired. Once the bees went back in it got the same inner cover, feed shim, and tele cover as in the previous picture. BTW, such a populous hive isn't usually bothered much by robber bees, or Hive Beetles.

You can start raising queens any time that you have drones, but it will be much easier to get good results – and easier period – during the main spring nectar flow/swarm season. In my area of **middle Tennessee Swarm season started hot and heavy during the first week of April** this past spring so counting back from that date I **set up my starter/finisher hive about March 15** (if I remember correctly) and **grafted for the first time around March 20**. The truth is, that the weather this April was very unsettled, and not the best for queen mating flights, but the early start allowed me to get a little practice in before the **prime queen production season – the month of May through early June**. Think about that when you order a commercial queen for early spring delivery – what was the weather like when that queen was trying to mate? Another reason to raise your own.

Setting up the Cell Builder Hive

The two outer frames are capped/emerging brood, the next two contain stores – honey and pollen, maybe some empty space for them to draw comb and store incoming food. The center position is where you will be putting your cell bar after you graft.

You want this hive to be very populous, so either shake in lots of nurse bees, or you can do what I did and set it up in a spot from which I just removed a strong full sized hive. That way most of the foragers from the big hive that was there before all crowd into the new cell builder – but make sure it also has plenty of nurse bees too. **Don't accidentally shake a queen in there** along with the nurse bees. After the initial setup the cell builder will stay strong – even get stronger – from the frames of brood that you swap in every week.

Once a week (more or less) when you are working your other hives swap in a fresh frame of capped/emerging brood. The open brood on those frames along with the grafts and other open brood that you add to the cell



This is the setup I started the season with – the top box houses a quart jar feeder. Before long I realized that the entrance through the slatted rack was too small for such a populous hive, and that the ventilation was not adequate.



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builder keep it strong and stable. When you swap in new brood, you also have to check for queen cells in the starter/finisher, and on any frames that you take out – you will find wild cells pretty much every time. But since it's only a 5 frame hive, and it doesn't have a queen you can shake the bees off, and thoroughly inspect every frame in just a few minutes. Usually there is no need to even look at every frame – 2 of them will be pollen/honey, and one will be the cell bar. It's pretty quick and easy maintenance, but it does have to be done at least once a week while the hive is being used.

How I (and you can) Finally produce Big Cells

I tried fruitlessly almost all of this year to produce big cells like others that I had seen on the internet. I packed my cell builder with bees which I fed copiously, I tried double grafting, priming with royal jelly, placing fewer grafts – but no matter how hard I tried my best cells were “OK” at best – until I found this [tip by Ray Marler](#): **4 days before you graft** put a frame of hatching eggs/young open larva in the cell builder. That will insure that your nurse bees get into feeding mode by the time you add your grafts. My experience is that if I skip this step I get **much** smaller cells. Joseph Clemens produces nice big cells without this step, because he is continuously using his cell builder – so the bees stay in feeding nurse bee mode – while I was only adding grafts to my cell builder every week or two.

When you swap in the cell bar with grafts on it there will almost certainly be queen cells started on the “primer” frame of open brood that you will have to deal with – whatever you do don't just put it back into a queenright hive or it is likely to be superceded by a queen from one of the cells. At that time also check the other frames for queen cells. If you ever let one emerge it will ruin any cells that are currently in the hive – and you might have a hard time finding a virgin lose in such a crowded hive.



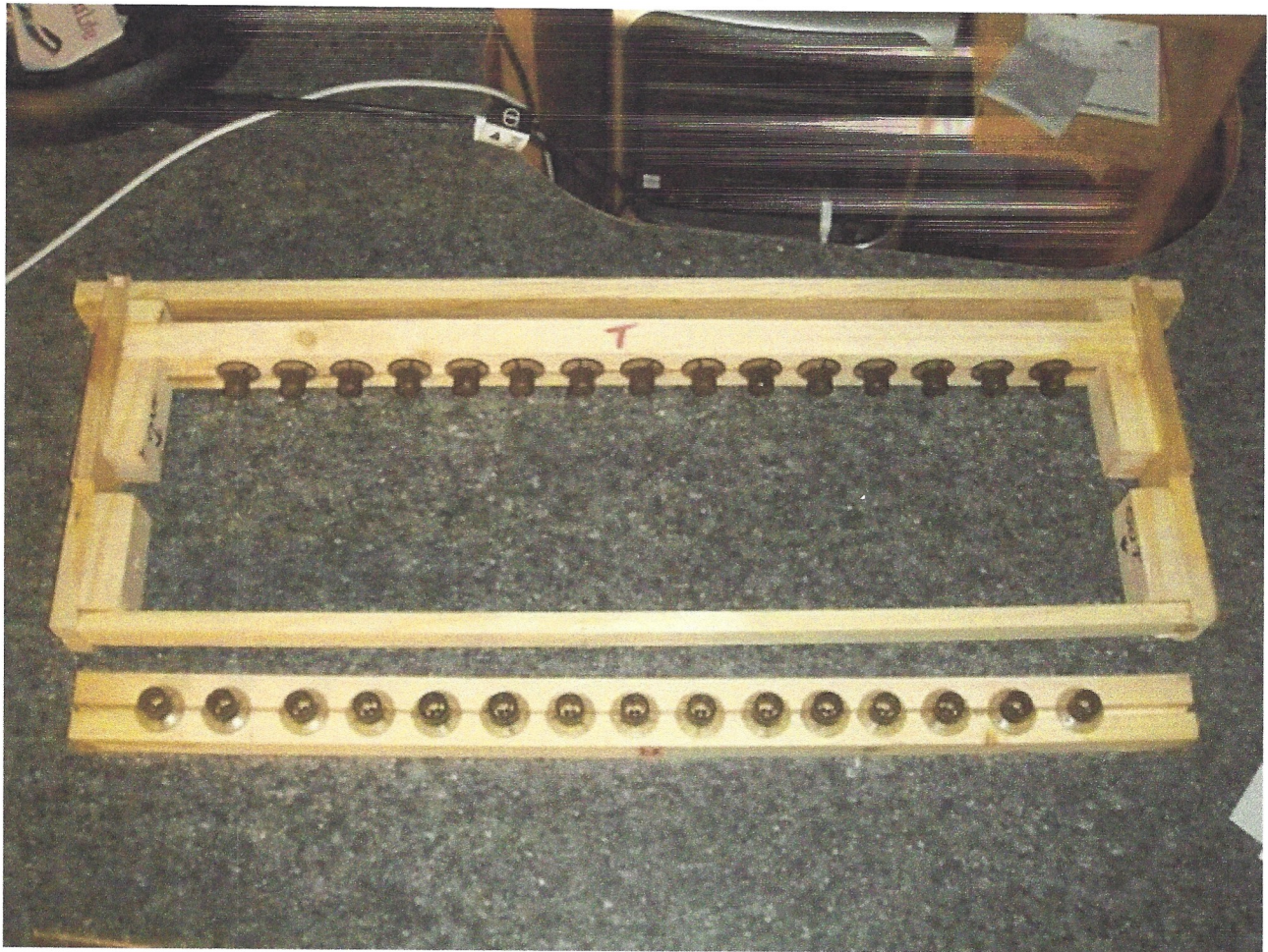
I feed my cell builder hive continuously – 1 to 1 sugar syrup from an inverted quart jar, and under the jar lid...



...Pollen substitute. I just spoon it in through the hole, and cover it with the jar lid. This is 8% protein mega bee mix with enough syrup to make a paste that is thick enough to not fall through the frames. The bees love it.

Grafting

Once you have your cell builder set up, fed, and it has had a frame of eggs and open brood in the center for 4 days it is time to prepare your grafts. I use a [Stainless Grafting Needle](#), but the Chinese tools are probably more popular among hobbyists. Really experienced hands can do it with a paper clip or toothpick – some favor a very small artists paint brush – there are lots of options available.



Home made cell bar frame with JZBZs cells installed – ready for grafts. Note – if you use a modified self spacing Hoffman style frame like the one in the picture after your cells are built and capped the bees will almost always build lots of burr comb on and around your cells, and nothing that you do will make much of a difference. It's not a disaster – your cells will be fine, you just want to carefully pick the wax away from the tip of the cell so that the queen can get out. But who needs that? The cure is to make a narrow frame ($5/8'' - 3/4''$) to hold your cells. The wide frame violates bee space, and the narrow one doesn't. It works like a charm.

Required Grafting Supplies

- Some kind of grafting tool
- Cell bar frame – Narrow ($3/4''$ wide) if possible.
- Cups to graft into

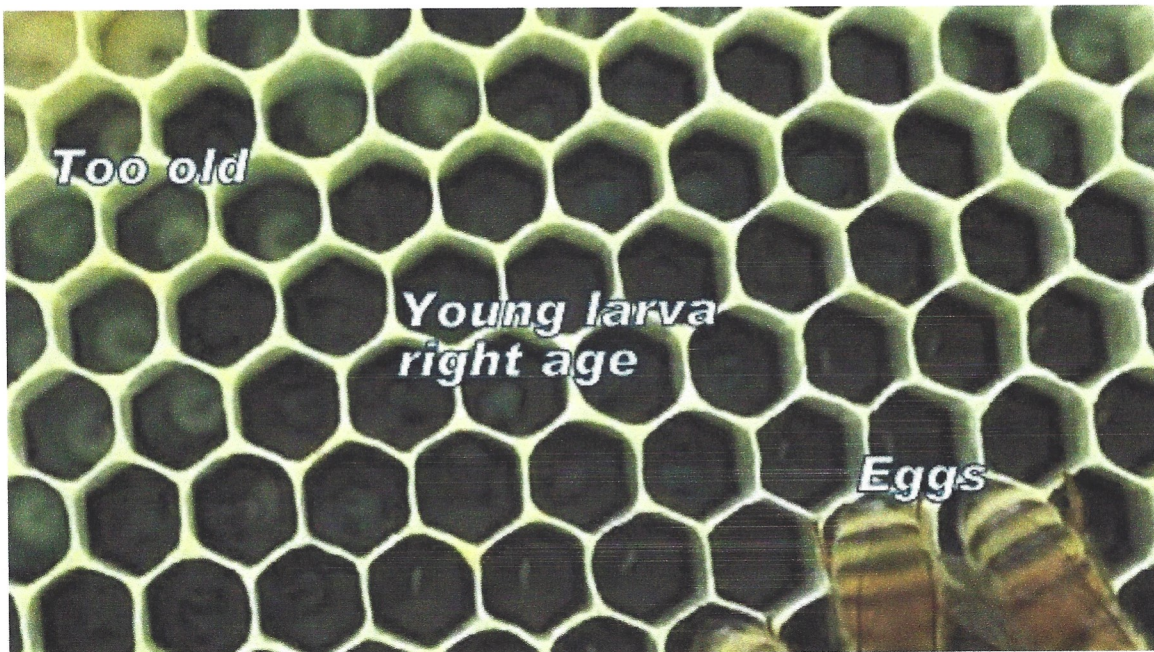
The experienced pros are very skilled and fast, and can get the job done with nothing more.

Optional Grafting supplies

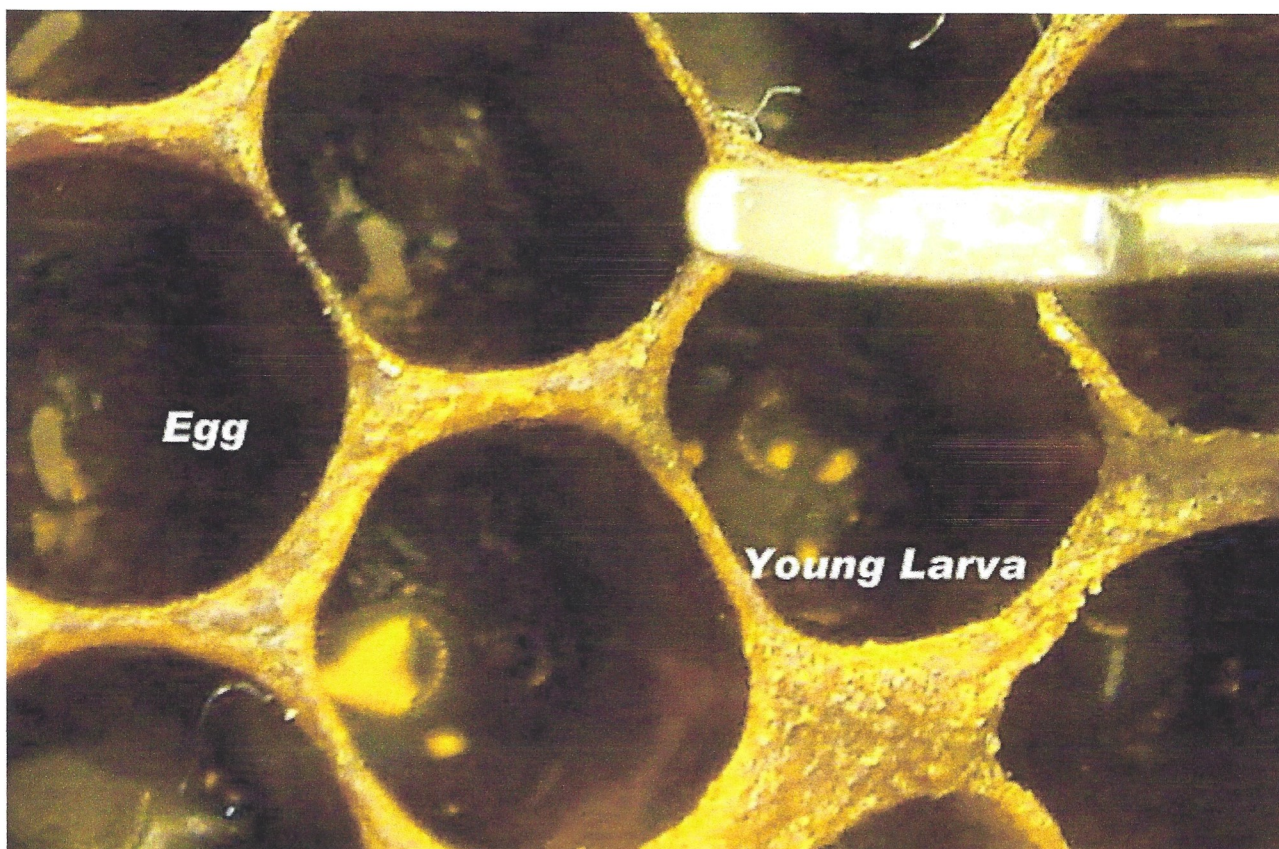
- Magnification – I have used dime store reading glasses, and a lighted desk magnifier (works pretty good but requires power) – but I very much favor a lighted Donegan optics Optivisor (jewelers visor) in 2.5 x power – it makes a huge difference for me (about \$50 from Amazon)
- Damp paper towels or equivalent to keep your grafts covered so they don't dry out

- Some liquid to “prime” (moisten) the cell cups with – water, sugar water, honey water, royal jelly, yogurt (did not work well for me), etc
- Hypodermic needle to apply the priming liquid
- Damp bath towel to wrap the frame of larva that you are using
- Auxiliary lighting (my lighted jewelers visor)
- Work surface
- Spring clamp to keep your cell bar from falling over
- Water to drink
- All of these are optional, but they also all improve my chances of success, and I keep them all together in a an old brief case that I use as a grafting kit.

Also of course you will need a frame of brood with appropriately young larva to graft from.



As you can see in this great photo by Jeff LaSorsa You will most easily find the best larva for grafting by looking at the ones between unhatched eggs and larva that are too old.



The larva that you want to graft are the ones that look like milky smudges of royal jelly – **as young as possible after they have hatched**. If you look really closely you can see them in there – not much bigger than an egg, but larva have segments. You shouldn't graft unhatched eggs, but other than that they can't be too young – if you see jelly it has hatched, the bees don't feed eggs.

Unless your eyesight is really excellent you can probably benefit from some supplemental light and magnification. At least choose a place to work that has good light. That is the tip of my grafting tool BTW.

Grafting Tips

- Put the frame that you will grafting from into the cell builder hive a day or two before you plan to graft – this helps 2 ways – 1) On Grafting Day you won't have to spend any time at all searching for material to work with. 2) Your cell builder hive will have the larva stocked with lots of jelly which makes grafting way way easier. Just make sure that the frame you choose has eggs/larva that will be ready when you do your grafting. (from – [AstroBee](#) via Beesource.com)
- Use a sharp knife with a curved belly in the blade to cut the comb down in the area you will be grafting from. The comb may tear some instead of cutting cleanly but it will still work. This makes it much easier to see what you are doing and to get to the larva with your tool. The bees will fix up the damage when you return the frame. This will really speed up your grafting and subsequently make it more successful.
- If it isn't warm – shirt sleeves weather – you need a place to graft where it is. Inside your car for example – if nowhere else is handy.
- **Before you start** open up the space for the cell bar in your cell builder hive by removing the frame of open brood from the center – leaving all the bees in the hive – so that you can get your grafts in there as quickly as possible.

- While you have the cell builder open check for any wild queen cells – they need to be removed, and you can harvest the royal jelly from them to prime your cell cups if you want.
- Everyone wants to use the youngest smallest larvae possible for grafts, but the truth is that as long as they are less than 36 hours or so old they are fine, and the slightly larger ones are much easier and faster for a beginner to work with. Slightly larger.
- It is easier to take grafts off of black plastic foundation – the plastic is stronger and you won't accidentally punch holes in it with your tool, and the black color makes it easier to see the larva. Much easier. Second best is old dark colored brood comb.
- In the spring you can take a partially drawn frame from a honey super and put it in the middle of the brood chamber and in about 5-7 days it will be full of perfect larva for grafting.
- Once you find the frame you want to graft from, and get all of the bees off of it keep it wrapped in a warm, damp bath towel except for the area you are grafting from.
- Don't shake your frame of larva too vigorously – brush the bees off of it.
- Don't try to do too many grafts the first time 8-12 maybe. You aren't going to be very fast, and also fewer grafts will get better attention from the bees. And let's be honest – you probably aren't going to produce prize winning queens on the very first try. Soon maybe, if you stick with it.
- It is easier to pick up a larva if your tool comes at it from the back of the "C" not into the open side of it – at least it is easier for me.
- Try to get as much royal jelly as possible along with the larva.
- When you pick up a larva on your grafting tool it is best if it is kind of hanging off of the tip – that way you can more easily deposit it in the cell cup.
- If you flip one, have to take several tries at it, or for any reason think it didn't go well – abandon that one and try again.
- It sometimes helps if you break out the side of the cell you are grafting from (right side if you are right handed) so that you have more room to manipulate your tool – the bees will repair it.
- The idea is to scoop up the puddle of royal jelly with the larva in it then deposit it into the cell cup – with little or no direct contact to the actual larva.
- It is easier to pick up larva that have a good bit of royal jelly – so feed the mother Queen's hive unless there is a good flow on.
- It makes it much easier to get the larva off into the cell cup if it is primed with the tiniest possible drop of priming liquid – royal jelly works best, but plain water is pretty close.
- As soon as you deposit a graft into a cup, cover it with your damp towel to keep it from drying out.
- As soon as you are finished get the grafts into the cell builder, and the brood frame back where it came from.
- JJBZs very popular plastic grafting cups can be used right out of the bag – many other brands recommend that you put theirs in a hive for a day to be cleaned and polished.
- Try different grafting tools. Finding the right style for you might make a big difference.

In 24 hours the ones that "take" will look like this:



24 hour old queen cells in JZBZs wide based cell cups – notice the royal jelly in the bottom of the cells.

It wouldn't be at all surprising if you have 60% or more success on the first try, but if you don't get at least 3-4 you might want to go ahead and try again immediately – no need to start over with a frame of brood in the cell builder, just take the first set out and regraft into new cell cups. It isn't unusual for the nurse bees to start a cell and then clean it back out in a few days if it has anything at all wrong with it, or if the hive is under stress. Don't be disappointed if your take is poor on the first try – you will improve quickly if you keep at it.



2 day old grafts



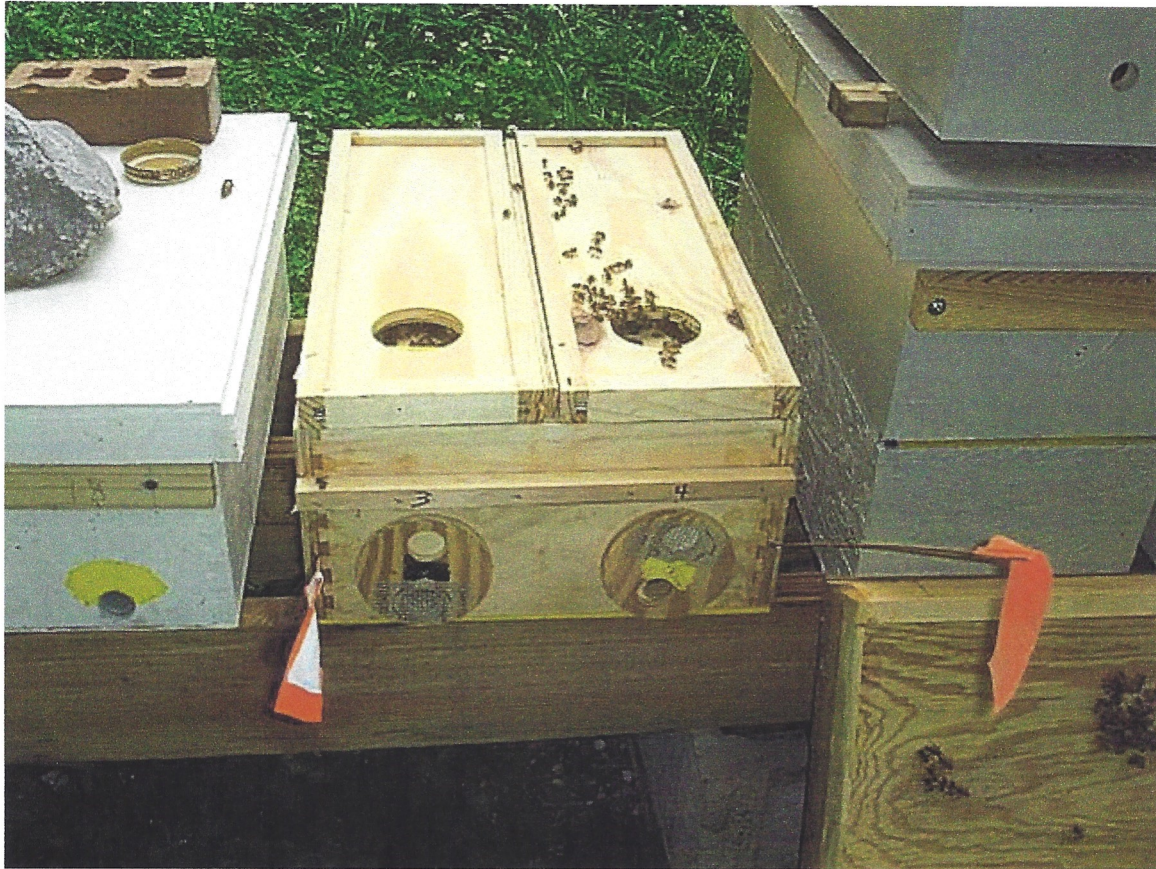
3 day old grafts



After the cells are capped on day 5 the larva starts consuming the stored royal jelly. Hopefully she won't run out until she is finished developing – that is why the cell builders need to have lots of well fed nurse bees. These are some of my “OK” cells that I mentioned. Cell size doesn't really seem to matter very much BTW – full sized, well formed, great performing queens can come out of smaller cells.

Once the cells are capped it will help to prevent the bees from building burr comb all over them if you take out a frame of food and give them a frame of foundation – or even better barely drawn foundation – to build wax on. You can also curtail feeding as long as there is a flow on.

After the cells are capped the developing queens are very fragile and you need to leave them alone until you remove them on the 10th day after grafting to move them into mating nucs.



An 8 frame medium hive body converted into 2 four frame mating nucs – The bottom is flat, and this design uses a standard telescoping cover as a lid. It works fine, but the bee space on the bottom isn't correct, which causes several issues. Also this particular design is more complicated to make than it needs to be.

Mating Nucs

Ten days after you graft you have to move your queen cells into (already prepared) queenless mating nucs – as previously mentioned if they are still all together when they start emerging then the first one out will kill all the rest of them. This is one of those steps which you must do on schedule – I don't even recommend that you wait too late on the tenth day to do it – I lost a batch like that during hot weather. Warm temperatures can accelerate the maturation process a bit.

Mating nucs are the most resource expensive part of queen rearing. If you have 2 good 20 frame hives to work with you could conceivably produce hundreds of good queen cells, but it would take everything you have to make up 20 full frame mating nucs using 2 frames each – if you had a perfect balance of brood and food frames. You probably would not want to do that. That's another reason why there is no need to do 40 grafts on your first try – growing into it as you learn helps to keep it more manageable anyway.



3 frame mating nucs in the apiary – I am feeding them using inverted mason jars through holes in the covers – the coffee cans keep the sun from heating up the syrup and forcing it out into the hives. I like this stand alone design – it's simple to make, is economical of materials and it works quite well. I've decided that I personally favor similar stand alone 4 frame nucs though. My current version is made so that 2 of them can winter together on top of a strong hive.

Baby nucs / Mini nucs – Some queen producers use tiny little nucleus hives that they can start with only a cup full of nurse bees – but that seems to me to be a more advanced method, and I have never tried it yet. I have only used mating nucs that use full sized medium frames. All of my frames are mediums BTW, which is very convenient when making up mating nucs.

Full sized Hives as Mating Nucs – You really don't have to have special nucleus hives to use as mating nucs – full sized hive setups will work fine – that is what I did the first time. If you are raising queens to increase your apiary that may be the best way to do it – that way you never have to move the queens once they are mated. However, I believe that nucleus hives do better in general when they are a little bit crowded in smaller boxes – it seems to me that they can defend and control the environment better. Nonetheless, for apiary expansion full sized setups work fine, and won't require much extra management at all once they are queen right.

Specialized full frame Mating Nucs – If you are interested in queen rearing for more than just expanding your own hive count you will probably want to use some kind of specialized mating nucs – full frame mating nuc boxes can be made to contain from 1-5 frames. There are advantages and disadvantages to any of them.

The trade offs between small nucs and big ones: Smaller nucs take fewer resources to start, and when it comes time to find the new queen it is an easier task with fewer/smaller frames to look at – A bigger deal than you might think. But the bigger the nuc is the more self sufficient and easy to manage it will be. During the main flow any nuc will grow and fill up – especially once they have a laying queen – and you will have to remove bees and resources from them to keep them from swarming.

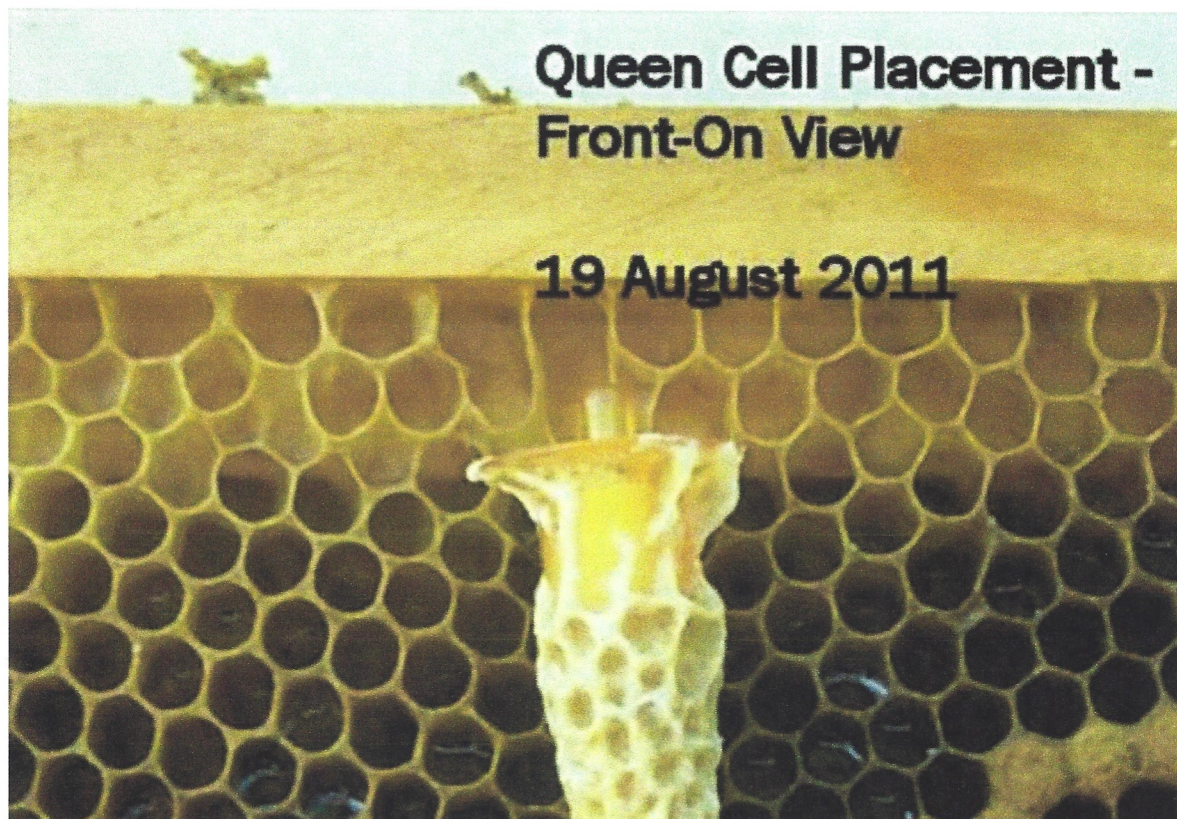
During the main flow full frame mating nucs produce valuable resources – drawn comb, brood, stores, bees – that can be used anywhere in your operation. Last spring I was using mostly 4 frame nucs, and I could take a frame of bees and brood from each of them about once a week – resources that I used to start new mating nucs. Later in the season I tried 3, 4, and 5 frame nucs, and at this time I think I prefer 4 framers as being a good balance between being big enough to be self sufficient, and yet small enough to be practical as mating nucs. When a 4 frame nuc gets too strong and needs a frame or two removed the part that is left is still a pretty strong little hive – more so than when you steal a frame or two from a 3 framer – just my experience. Nonetheless, I'll reuse all of them next year – they all work.

Setting Up Mating Nucs – Whatever size box you use you can set up good full frame mating nucs with just two frames of resources – one frame of brood, and one frame of food – and of course the bees that are clinging to them. You should always fill the remaining space with something – frames of empty foundation, foundationless frames, drawn comb, whatever – if you leave it empty, before you know it the bees will build wild comb from the inside of the cover – making a wasteful mess. Also a frame of foundation right next to the tiny colony of bees will shelter them a bit and make it easier for them to control the temperature around their nest area.

There is a need to be enough bees to cover and take care of the brood – if in doubt shake in some more. Keep in mind that any foragers will return to the hive that they came from – so shake bees off of brood frames in the middle of the day (when most of the foragers are out) if possible so as to get as many nurse bees as possible. There is no need to close up the nucs or move them to a remote location – they will start foraging in a few days. The frames and bees can come from multiple hives. **Needless to say, you need to be sure to not accidentally put a queen in one – if you do she will probably be killed by the virgin which emerges from the cell** – Newly emerged virgins are queen killing machines.

Prepare mating nucs the day before you will be installing cells.

On the next round all you have to do to prepare these same nucs for another cell is to remove the resident queen from the mating nuc the day before or at the time you give the hive a new cell – unless it fails to make a laying queen, but I'll get to that later.



A ripe queen cell installed in a mating nuc – all you have to do is push the cell into the comb like this – preferably near brood. That’s the kind of cell we all want to produce.

On the tenth day after making grafts – Placing the Queen cells is almost anticlimactic – just stick the cells to the brood frames as in the picture above. If you are not using plastic cell cups, just use your finger to make a depressed spot on the comb and gently stick the cell to it. The cell needs to be near brood if at all possible and in the center of the nest area. At all points handle the cells as carefully as possible. Close up the mating nuc and wait for nature to take its course. The queen will emerge within a day or two, and after a few days of hanging out in the hive – hardening up and being cared for by the resident house bees – she will fly out to mate. You may be able to detect eggs in 10-12 days, but unless you have a rather good eye for eggs it is probably best to wait about 3 weeks after placing the cell – at which time you should be able to easily see large open brood – or even capped brood. Waiting a bit longer also gives the queen more time to fully developed without being pestered. Some experts say that this is very important, some don’t. It certainly makes it much easier to make the call as to if you have a laying queen or not. However after 3 weeks, any nucs that are still queenless, will need immediate intervention – fresh brood, and a new cell – or they will soon decline and/or develop laying worker.

Mating Nuc Management – If it is during the main flow, and you make up your nucs on the day before installing a cell as I have outlined – with a good frame of brood, and a good frame of food, and plenty of bees – the hive will get stronger over the next couple of weeks as the brood emerges. If it is successful in making a queen, then it will develop quite nicely with little intervention. Since it started with a food reserve, and forage is plentiful during the flow, you shouldn’t need to feed it at all. Also during the spring flow, there shouldn’t be much if any issues of robbing, hive beetles, or wax moths. It’s really pretty easy to take care of your mating nucs under such conditions. Mostly you will just need to keep an eye on them to keep them from getting so strong that they swarm – as mentioned before you may need to remove brood frames with bees on them almost once a week during the peak season. And of course, you will have to remove the resident queen before you can put another cell in it.

Robber Screens – I highly recommend that you fit all of your mating nucs (or any nuc for that matter) with [robber screens](#). They are cheap, simple and easy to make, and they work – especially if installed right when the colony is first established. After much experimentation, I can state without reservation that queens have no problem flying out and returning from mating nucs with robber screens. The numbers actually are better with them, because of the reduced stress from robbing.

However, if a nuc doesn't make a queen for any reason it can start to go downhill quite quickly without intervention. You need to inspect all mating nucs about once a week to make sure they aren't raising their own queen cells (unless you want them to) and to assess their condition. Any that are queenless need to either get a new cell or be combined back with a queenright hive. Before a queenless nuc gets a new cell it is probably best to give it a new frame of brood as well – you may not need to give it any more bees because it should already have a workforce.

Actually, the location will have a workforce. If you move a hive – any hive – to a new location, the foragers will all go back to the old spot. If there isn't a hive there they will still go to that spot and hang around in complete confusion for a few days. And then they will beg into a nearby hive. You can use this behavior to your advantage at times by swapping locations of strong and weak hives to equalize the populations.

It doesn't take very much time or work to go through and care for a 3 or 4 frame mating nuc. But when you do it every week, and multiply it by 10 mating nucs (or 20, or 30) it may be a bigger job than you think. Another reason to start small.

Summer Queen Rearing – Everything gets harder after the spring flow ends. After the flow you have to feed because forage is scarce, the stronger hives rob the mating nucs, even the strong mating nucs rob the weak ones – heat, wax moths, and hive beetles become issues – it's also harder to get your cell builder to perform. All of those things can be managed of course. The point is, if you want to learn to raise queens you should plan to do it when it's easier (and better) whether or not you plan to continue during the hard times of high summer.

Until now I haven't mentioned genetics, drones, or breeding selection. Those are important aspects of queen rearing of course, and well before you get to the point of producing hundreds of queens per year you will of course need to learn a thing or two about those matters. However if you are only learning or dabbling, or just want to raise a few good queens for yourself – you surely will take grafts from what you believe to be a worthy queen, and chances are there will be enough drones available during the Spring season to properly mate a dozen or so queens at a time. But since each queen needs to mate with 12 – 20 drones a little math shows that it might become an issue sooner than you think. So read.

Parasites and Disease – It should go without saying that every hive that donates resources to your queen rearing effort needs to be healthy. Mating nucs made up with mite ridden brood are not going to get you the results you want. The same goes for European Foul Brood and other diseases. Learn to recognize the symptoms of common honey bee maladies and only use resources from healthy hives.

[The Numbers](#)

Other than my very first try I have always had at least 50% success rate at grafting and getting them built into cells. Before too many times I started averaging about 80%. Usually there are at least a few of those that are smaller and really shouldn't be used – so call it 60% success rate at grafting. You might do better.

My first few years once I placed cells in mating nucs only about 50% of them ended up becoming laying queens – I know that most of them emerged because of the condition of the empty cells, but from the beginning of the season all the way through August it was consistently about 50%. I was never very happy with that. Since then I have been able to improve that to more like 80% by moving my mating nucs to an out yard where they aren't

raided by nearby strong hives, using robber screens (which I now think makes a bigger improvement than anything else) on all mating nucs (queens get mated and return just fine even with robber screens in place) and by arranging the nucs in star-shaped groups of up to 4 nucs with the entrances all facing out from the middle. Even if you don't have access to an out yard I suspect your numbers will be improved by the other tactics mentioned.

- A honey bee egg hatches about 3 days after being laid.
- A larva is fit for grafting and making a queen for only about 36 hours – younger is better.
- A cell is capped on about the 5th day after grafting.
- Between capping and emerging the developing queen is extremely delicate at times and the cell shouldn't be handled except when necessary – and carefully then. Although at 10 days the cell is relatively robust.
- A virgin queen will emerge from the cell about 13 days after grafting. Warm weather speeds this up.
- By as soon as 4 days after emerging from the cell a virgin queen will be ready to mate.
- She will mate with as many as 25-30 (Supposedly an average of 15 or so) drones over the course of several days.
- Once mated she may start laying eggs in 3-4 days.
- A Queen will continue to develop and mature for several weeks, and it is generally suggested that for best results she not be banked or caged for about 3 weeks after planting the cell in the mating nuc.

Update...

I wrote this article several years ago now and every year it gets revisited and I think it has helped several people get started in queen rearing. Since then I have tried other methods to raise queens but this one works best for me and I use it at some scale every year. And needless to say, I've learned a thing or two...

The original article is pretty specific about how to arrange the hive, but the system will work no matter how you have the hive arranged as long as there are tons of well-fed nurse bees. I got the technique from Joseph Clemmons originally so I followed his lead and that is how he said he arranged things, but I've experimented a fair bit with it since then and the system is pretty forgiving as long as you have plenty of those well-fed nurse bees. The original way is probably as good as any and better than most, but don't get too hung up on it as long as the hive has all of the required resources in it.

You can get good results with this system on the first cycle, but the real advantage to it emerges when you use the same cell builder several times without having to rebuild it – and it actually gets better for several cycles as its population of foragers build up to keep it very well fed on its own – I still feed continuously though just for good measure.

Just by doing some fairly simple maintenance on schedule you can produce up to a dozen or so high-quality queens (or as few as you want) every 11 days – more or less depending on the particulars of how you manage it.

Here's the routine I've been using lately once the first cycle is started...

On day 5 when the current cells are capped I check the hive for wild cells on the brood frames. Most of the brood on those frames is now capped and a good bit has emerged and the cells back filled with honey (or syrup) and pollen – those stay in the hive until nearly all of the brood has emerged. Brood frames from the previous cycle have almost or completely emerged and are now solid honey/pollen – I replace those with frames of open brood and eggs to get the nurse bees primed for the next batch of cells.

On day 10 when I pull the current cells to put them in mating nucs I inspect for wild cells again and replace the cell bar with the frame I want to graft from. By now most of the open brood on the brood frames has been capped so the bees will be able to give my grafts plenty of attention. I arrange the hive so that there is plenty of fresh pollen next to where the grafts will go.

They ALWAYS build lots of burr comb around the cells between capping and day 10 – but it just does not hurt anything so I don't try to stop it – I've tried, but nothing really works for me – Just cut/pick off enough of it to expose the cell tip when you place them.

On Day 11 – grafting day for the next batch – the larva are well fed and stocked with royal jelly. After grafting I return that frame to the queen mother hive and replace it in the cell builder with my cell bar frame.

5 days later – Repeat. If this sounds like a lot of time-consuming work – it's not really – once the cell builder and 2 sets of mating nucs are all set up you can easily do everything but grafting in 10-20 minutes (grafting too if you are fast – which I am not) but it does require you to keep on schedule for the most part. The only time you can slack off for a day or two is between pulling finished cells and grafting the next batch.

This routine uses 2 sets of mating nucs for continuous production and the queens stay in the nucs for 22 days before you use them which is just about perfect. By the time you need to place the 3rd set of grafts in mating nucs the first set of queens is ready to use or sell – making the first set of mating nucs available to receive the new cells. After that, you can harvest queens every 11 days for the rest of the reproduction season if you keep it up.

To make this system of queen rearing economical you really need to use 2 sets of mating nucs (although it could be as few as 4-6 total mating nucs) to keep the cell builder in use, and you need to produce at least 2-3 queens per mating nuc. Otherwise, if you count the cost of honey, brood, and feed that it takes to set everything up – and what that costs you in honey production – you would be just as well off financially to just buy queens – or to produce queens by splitting or some other simpler method. However, you may very well produce better queens than you can buy – so there is that.

A word to the wise – queen rearing (or any kind of increase) is all much easier during the spring flows / peak swarm season, and gets harder as hot dry summer weather emerges. So get out there and do it! You will learn a lot and you can make increase and requeen all of your production hives without spending \$20-30 each for queens – and when you have more than you need I almost guarantee you can find homes for them if you are in a club.

There are other ways to go about it but this routine has been working quite well for me, and with 2 sets of mating nucs you can keep it up as long as you have something to do with the 22 day old queens.

Other Resources

[Moving from OK Queens to Great Queens](#) – Discussion on Beesource Queen rearing forum.

Graftless Methods of Queen Rearing – If you have really bad eyesight or unsteady hands, any of these methods can produce high quality queens.

- [Oldtimer's – queen rearing without grafting](#),
- [The Cell Punch method](#)
- [Michael Bush's A Few Good Queens Method](#) – Michael Bush also has many public domain books about bee keeping and queen rearing on his website, and has also authored his own book "[The Practical Bee Keeper](#)".
- [Previous Entry: How to build strong bee hives for honey production](#) – Ed Holcombe