

## **SPLITS: Scot McPherson, Michael Weiler and Michael Bush, David Heaf, John Hampshire, etc.**

Probably the better question is "when is the best TIME to do a walk away"? You should do it when there is a flow either on or about to come on (there should already be nectar and pollen available). You should do it when there are plenty of drones. You should do it when the hive is strong enough. That's two ten frame deeps (or three ten frame mediums or four eight frame mediums) full of bees and brood and honey. A strong split will build back up quickly and a strong split will weather the queenless period of raising a queen better.  
Michael

How To Do Splits <http://www.bushfarms.com/beessplits.htm>  
Michael Bush

From: Scot McPherson

Well you can look at it this way....If you are going to loose your bees anyway, which is better? Spend more money and work harder to loose them or spend less money and work less and lose them? Well at least with the initial losses of converting to a more natural system, you have hopes of the bees adapting. If you keep up the chemical ways, and import queens and so forth, you remain at square zero and never move forward toward a balanced adapted system.

So, stop using the chemicals. Practice the art of increase. Split your hives 3:1, and let them localize. Don't import queens or you are doing absolutely nothing for the bees. Let them raise their own queens...if they get nasty, then pinch the queen and let them raise another one again.

When I do splits, first thing I do is evaluate the hives for combining. Don't suffer the weak. A have you combine today has a good chance of being a hive you split out again later in the year. two weak hives will perhaps only just get by without producing anything for you and perhaps will just die away because they fall to some pest like Varroa or SHB or whatever. So do combines first. Then after those have been combined, decide which to split of your strongest colonies (obviously not one of the ones you just combined).

When I perform a split, I take the strong colony and take 3 or 4 frames of various stage brood AND the queen and put them in a new single story deep. If you use mediums then adjust your method, but it's pretty much the same. I let the old colony raise a new queen on it's own. Since the split has the queen, and the parent hive has the majority for the worker they'll both rebound very quickly from the split. If you place empty frames without foundation into the spaces where the old combs came from, they'll fill in with nice straight comb on all their own without any foundation needed. And the bees will do it faster.

Later in the season appropriate to do splits again, evaluate you hives for combines and splits again, and do the same thing. Continue this as long as appropriate for your area, or until you have your target number of beehives. When you have reached that target, start making NUCs for sale. You could sell 3 to 6 NUCs from strong colonies each year. Good strong NUCs can fetch a handsome price, worth more than a colony's honey production sometimes. Plus you will be helping with the dwindling bee supplies.

You MUST practice the art of increase for this work until your bees settle down and adapt. You WILL loose hives. But each year those losses will decrease. Noting of course you are talking about a target 10 hives, so you could potentially loose them all even after adaptation because the you have a smaller population, but even still your chances are far better.

The diversity of genetics you create by letting your bees open mate increases your overall operations chances for survival since you won't have a "stacked queenline" which means the queen may be good for some things, but when something "new" comes about your bees could ALL be wiped out at once.

Anyway, that's the basic gist of it. Here in Iowa where I now operate, I have two split seasons, once right after winter break and there is pollen and more drones about, and in the late summer after the last summer flows start to ebb. This year I performed an average across the board of 5:1 splitting sacrificing my honey crop this year for the increase in numbers for next year, then I will steadily perform the art of increase to keep my numbers stable. Combine the weakest, and then split the strongest in the fashion I outlined above will keep you going, and produce bees for you to sell after you have reached your target bee yard size.

I hope this is helpful.

Scot McPherson, CISSP, MCSA

McPherson Family Farms

Le Claire, IA, USA

ADDED: I do inverse walk away splits....that is, the queen goes with the split, this leaves the parent hive the largest majority of the population for good raising/caring of a new queen. The split has the queen so she'll just keep on laying and building the split right back up. I do full body splits though, I don't do splits of a few frames. Scot McPherson, CISSP, MCSA

### **SPLITS: Scot McPherson, Michael Weiler and Michael Bush**

From: Michael Weiler

Question put to Biodynamic Beekeeping Consultant Michael Weiler

21. What do you do about swarm control?

All beekeepers know when swarming starts in their region. Once it starts you have to monitor your colonies for signs of the swarm process. First you'll find queen cups, later you'll find eggs or larvae in these cups. Now you can be sure that the process has started. The organism can stop this process at any time. The point of no return is when the prime swarm leaves the hive.

We remove any unneeded frames in autumn – maybe 2 or 3 if the brood box is big enough and put in dummy boards. Then in spring when the bees need more space we add empty frames so that on inspection we just need to check the new frame. We can learn to read the form of the newly built combs to see if the swarm process has started. If there are worker cells and a smooth line, all is OK. If it is wavy or there are a lot of drone cells or queen cups then something is going on and you will need to check further.

If we wish to prevent the swarm from flying away or settling in a treetop, the following procedure can be used to hold back the swarming drive. Shortly before the swarm prepares to leave the hive (up to two days before if necessary) we open up the hive, look for the queen and take her out. Then we carefully sweep the bees off the comb in the brood chamber via a funnel into a swarm box until we have at least 1.5Kg of bees. Then we let the queen join them and place the box in a quiet, dark and cool place (like a cellar) for up to three days. The bees must be fed well during this time otherwise they will starve. After about three days the swarm is placed in a new hive with empty frames.

About 30% of colonies will swarm each year on average which is just enough for natural regeneration.

### **SPLITS: Scot McPherson, Michael Weiler and Michael Bush**

From: Michael Bush

How to do Splits

What is the desired outcome?

I would choose my method for doing a split depending on what you want for an outcome.

Reasons for doing a split:

- To get more hives.

- To requeen.
- To get more production.
- To get less production (for people who don't want too many hives or too many bees).
- To raise queens.
- To prevent swarms.

Timing for doing a split:

As soon as commercial queens are available, or as soon as drones are flying depending on if you want to buy or raise queens you CAN do a split. It depends again on what you want for a outcome.

There are an infinite variety of methods for doing a split. Many of these are because of the desired outcome (swarm prevention, maximizing yields, maximizing bees etc.) Some of the variations are also due to buying queens or letting the bees raise queens.

The simple version is to make sure you have some eggs in each of the deeps and put them facing toward the old location. In other words put a bottom board on the left facing the left side of the hive and one on the right facing the right side of the hive and put one deep on each and maybe an empty deep on top of that. Put the tops on and walk away.

There are an infinite number of variations of this.

The concepts of splits are:

You have to make sure that both of the resulting colonies have a queen or the resources to make one (eggs or larvae that just hatched from the egg, drones flying, pollen and honey, plenty of nurse bees).

You have to make sure that both of the resulting colonies get an adequate supply of honey and pollen to feed the brood and themselves.

You have to make sure that you account for drift back to the original site and insure that both resulting colonies have enough population of bees to care for the brood and the hive they have.

You need to respect the natural structure of the brood nest. In other words, brood combs belong together. Drone brood goes on the outside edge of the brood and pollen and honey go outside that.

The old adage is that you can try to raise more bees or more honey. If you want both, then you can try to maximize honey in the old location and bees in the new split. Otherwise most splits are either a small nuc made up from just enough to get it started, or an even split.

Kinds of splits

An even split. You take half of everything and divide it up. Face both of new hives at the sides of the old hive so the returning bees aren't sure which one to come back to. In a week or so, swap places to equalize the drift to the one with the queen.

A walk away split. You take a frame of eggs, two frames of emerging brood and two frames of pollen and honey and put them in a 5 frame nuc, shake in some extra nurse bees (making sure you don't get the queen), put the lid on and walk away. Come back in four weeks and see if the queen is laying.

A typical split. Same as above, but you either introduce a queen you bought or walk away and let them raise their new queen. If you introduce a queen they will be three weeks ahead of the hive that is raising their own, so you will have to put them in a larger box than a nuc to start with.

Swarm control split. Ideally you want to prevent swarming and not have to split. But if there are queen cells I usually put every frame with any queen cells in it's own nuc with a frame of honey and let them rear a queen. This usually relieves the pressure to swarm and gives me very nice queens. But even better, put the old queen in a nuc with a frame of brood and a frame of honey and leave one frame with queen cells at the old hive to simulate a swarm. Many bees are now gone and so is the old queen. Some people do the other kinds of splits (even walk away etc.) in order to prevent swarming. I think it's better to just keep the brood nest open.

A cut down split.

Concepts of a cut down: The concepts of a cut down are that you free up bees to forage because they have no brood to care for, and you crowd the bees up into the supers to maximize them drawing comb and foraging. This is especially useful for comb honey production and more so for cassette comb honey production, but will produce more honey regardless of the kind of honey you wish to produce.

This is very timing critical. It should be done shortly before the main honey flow. The purpose is to maximize the foraging population while minimizing swarming and crowding the bees into the supers.. There are variations on this, but basically the idea is to put almost all the open brood, honey and pollen and the queen in a new hive while leaving all the capped brood, some of the honey and a frame of eggs with the old hive with less brood boxes and more supers. The new hive won't swarm because it doesn't have a workforce (which all returns to the old hive). The old hive won't swarm because it doesn't have a queen or any open brood. It will take at least six weeks or more for them to raise a queen and get a decent brood nest going. Meantime, you still get a lot of production (probably a lot MORE production) from the old hive because they are not busy caring for brood. You get the old hive requeened and you get a split. Another variation is to leave the queen with the old hive and take ALL the open brood out. They won't swarm right away because the open brood is gone.

Confining the queen. Another variation on this is to just confine the queen two weeks before the flow so there is less brood to care for and free up nurse bees to forage. This also helps with Varroa as it skips a brood cycle or two. This is a good choice if you don't want more hives and you like the queen. You can put her in a regular cage or put her in a #5 hardware cloth push in cage to limit where she can lay. They will eventually chew under the hardware cloth cage, but it should set her back for a while.

Cutdown Split/Combine. This is a way to get the same number of hives, new queens and a good crop. You set up two hives right next to each other (touching would be good). Two weeks before the main flow you remove all the open brood and most of the stores from both hives, and the queen from one hive, and put it in a hive at a different location (the same yard is fine, but a different place). Then you combine all the capped brood, the other queen, or a new queen (caged), or no queen and one frame with some eggs and open brood (so they will raise a new one) into one hive in the middle of the old locations so all the returning field bees come back to the one hive.

Frequently Asked Questions about splits

How early can I do a split?

It's very difficult for a split to build up unless it has an adequate number of bees to keep the brood warm and reach critical mass of workers to handle the overhead of a hive. For deeps this is usually five deep frames of bees with three of them brood and two of them honey/pollen in each part of the split. For mediums this is usually eight medium frames of bees with five of them brood and three of them honey/pollen. I'd say you can split as early as you can put together nucs that are this strong. Later in the year when it's not frosting occasionally at night, you could get by with somewhat less, but you'll still do better with this much.

How many times can I split?

Some hives you can't do any splits as they are struggling and never get on their feet. Some hives are such boomers that you can do five splits in a year, although you probably won't get a honey crop.

How late can I do a split?

What you really need to ask yourself is "when is the best time to do a split". By the bee's example that would be sometime before the main flow so they have a flow to get established on. However this tends to cut into your harvest, so you could do them right after the main flow and probably still have time to build up for the fall, if you make them strong enough and give them a mated queen.

I'm in Greenwood, Nebraska. In a year with a good fall flow, I can do a split on the 1st of August that may build up enough to overwinter in one or two eight frame medium boxes. But if the fall flow fails they may not build up at all.

Michael Bush

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### **Split by the box**

If you've got a booming hive you want to split in the spring, don't look for the queen, don't look for brood, just split it by boxes. The bottom two boxes that are seriously occupied by bees probably have brood in them. Of course success is mostly dependent on being able to guess pretty accurately that you have brood and stores in both boxes. If you're wrong, you'll end up with one box empty after only a day or so. But if you are right, you've saved a lot of work. With eight frame mediums (which are half the volume of a ten frame deep) the odds of this working on a hive that is at least four boxes (the equivalent of two ten frame deeps) is twice as good. By going every other box you maximize the odds of getting brood and stores in both resulting colonies. You just deal the boxes like cards. Put a bottom board on each side and do "one for you and one for you" until you're done. Come back in a month and see how they are doing. Michael Bush

### **More on splits:**

This is basically why when I do walk-away splits (almost all of them are in my case), I do make sure the queen is going with the split while the mother hive is left to raise a new queen. The split has what it needs to build up, and the mother-donor hive has the workforce needed to do a good job of raising a replacement queen.

Not only that, but I believe it simulates and satisfies swarming better when the queen and her bees find themselves in a new location and the old location raises a new queen.

Scot McPherson

### **More on splits:**

From: David and Sheri Burns Long, Lane Honey Bee Farms

<http://basicbeekeeping.blogspot.com/2007/11/lesson-fifteen-making-spring-splits.html>

There are several advantages and reasons why you will want to split your hives:

- To increase the number of you hives.
- To prevent swarming.
- To produce nucs.

MAKING SPLITS IN OVERWINTERED HIVES

It is important to realize that splits should only be made from overwintered hives, or what we refer to as second year hives. A first year hive usually will not expand enough to split.

Of course, how soon you start to split your hives will depend upon where you live. You will have to wait until the evening temperature is warm enough so that the transferred brood will not become chilled. It is a gamble for me, here in Central Illinois, to make splits prior to the month of May. A thoroughly populated hive can keep their brood warm on a cold night, but not a small split.

Although there are many variations in making splits, let me give you the simplest explanation, then I will expand upon the variations.

In its simplest form, a split is nothing more than several frames of brood, bees and food sources taken from a strong hive, and placed in an empty hive. You might think of it as a controlled swarm, although a natural swarm only consist of bees and not brood or comb. But, when making a split, we also add brood, nectar and pollen to the split. Thus, making a split can discourage swarming.

When I make splits, I simply pull our 4 or 5 frames of brood in various stages of development, along with the bees on those frames, and place them in an empty box. I also add a frame or two of nectar and pollen from the strong hive. And, I feed my new split 1:1 sugar water as well.

If you know that your transferred brood has eggs that are less than three days old, you do not have to add a queen as the split hive will realize they are queenless and begin to raise their own from the fertilized eggs in the brood. This is preferred when I wish to retain the qualities of the queen from the strong hive.

This is convenient for me, because it doesn't matter to me where the queen is, either in the old hive, or perhaps I moved her over to the new split. As long as both hives have 1-3 day old eggs, the queenless hive will raise their own queen.

#### CHALLENGES IN MAKING SPLITS: ADDING VARIATION TO INCREASE SUCCESS

Since I have lots of hives in small areas, I have found that my stronger hives have a tendency to rob my small splits of their honey. Therefore, if you find this to be a challenge, simply move the split at least 2 miles a way, keeping it there until it can become large enough to defend itself. Then you can bring it back and place it where you want.

Also, sometimes I fail to supply enough bees, especially nurse bees, to care for the amount of brood I have transferred into the new split. Therefore, it is helpful to shake frames of young bees into your split hive. It is best to shake them from the hive the split was made from to prevent fighting.

Another challenge may be that one of the hives may not raise their own queen. In this case, it is important to check within a few days to see if a queen cell is being formed. If not, you will need to call us up and order a queen.

Another slight variation is to add the variation of a screen. In this case, the split is on top of the established hive. The split is placed on top of the hive they were removed from, with only a screen to separate the old hive from the split on top. The heat from the old hive keeps the split warm above. This is successful but the entrance of the split on top should face the opposite direction than that of the hive below. Eventually, the split can be taken off the hive and moved to it's autonomous location.

Some beekeepers claim to make 16 splits from one hive each year. Generally you can always make one split but sometimes 2, 3 even 4!

Make you splits as early as you can, as the split will need time to prepare for winter. There are many who are practicing splits in the fall. This is possible, however, if you live in a region with hard winters, you will have to place the split on top of an established hive, divided by a screen, and the split must be fed or have plenty of nectar and pollen.

I have also made splits with just two frames of brood and bees. So, you'll have to experiment and see what number works for you.

Making splits is really pretty easy! And think of the savings of not having to buy a package or a new queen.

I have fun doing the math with splits, like this. Say you have 2 hives and in 2008 you make a conservative single split from each hive. Now you have 4 hives. In 2009 you get brave and split your 4 hives, but this time you make 2 splits from each hive. Now you have 12 hives.

12 split twice = 36 hives by 2010

36 split twice = 108 hives in 2011

108 split twice = 324 hives in 2012

324 split twice = 972 hives in 2013

In 5 years 2 hives could increase to nearly 1000!

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**David Heaf** Sun Mar 6, 2011 11:35 am

Ernie wrote: "I am planning on doing it this year, unless anyone has horror stories of this method failing for them."

I can speak only from experience of National/National or National/Warré splits. All of them have involved the queen and the field bees remaining on the original site and the brood and house bees going to another position in the apiary. That gives two levels of security regarding the flying bees: 1) they know where home is; 2) they find the queen is still there. With National/National splits, I have provided a third level of security on the old site in the form of a comb of fairly advanced brood. The National/Warré splits have not had that third 'anchor' but they worked nevertheless.

If the queen is in the hive moved elsewhere in the apiary, there's a risk that the field bees will sniff her out and move back in with her. That's why the split is taken well away from the apiary.

The only times I have had artificial swarming fail was with using a Taranov board, something recommended for when swarming is imminent, i.e. there are capped queen cells. It worked fine on two out of four occasions but on the other two the bees all ended up back 'home'. The queen must have been too 'flighty' and probably crossed the gap between the Taranov swarm and the parent hive.

David Heaf North-West Wales, UK

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Also bear in mind what Winston writes (1). "Queen brood survival rate is similar to drones, about 53% from egg to adult (91% eggs, 75% larvae); Lee 1985" ....and later... "The effect of environmental conditions within the colony on brood survival is confirmed by observations of the brood under stressed conditions, when mortality is much higher."

My mentor used to say 3 out of 4 queen losses were down to the beekeeper. Last year, 2 conventional beeks (I know of) performing artificial swarms, with the inevitable queencell culling, reported many instances of queen failure in their colonies.

I prefer to let the colony select the best queen from the batch the bees created.  
John, Hampshire UK April 10, 2011

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Re: Split follow up  
David Heaf North-West Wales, UK Sat Apr 23, 2011 10:31 pm

Bernhart wrote: "Every Comb also hat some scattered capped brood. I dont know if they did not hatch due to a disease or just were not ready for hatching."

It could have been emerging brood, which case the queen, before she was smoked down, may have already laid in the vacated cells.

Bernhart: "1) what signs should I look for in order to decide if the queenless hives are able to raise a new queen? If they still collect pollen?"

I have not yet split a Warré, having so far managed to make increase from swarms. But looking at Gilles Denis video of a split without finding the queen (in the Group's files area) he appears to check for brood in each half of the split by parting combs with the flat of a hive tool. From the way he does it it seems highly unlikely that he is checking for eggs. Presumably he takes the sight of some capped brood as an indication that the queen is laying in that particular box. Note that he advises taking one half of the split 3 km away.

Bernhart: "2) Is there a danger that the queenless hives get honeybound even if they have enough space under the broodnest? We have two weeks of rape (brassica napus) ahead."

If as John M pointed out to Bil, foragers drift back to the queen right half while it is in the same apiary, then that would further reduce the amount of honey deposited.

As you cannot sure there were eggs in the queenless half, you could check sooner rather than later, for emergency queen cells. If there are none you could then reunite and thereby avoid wasting bees.



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Swarms versus splits (was David Heaf's book, swarming, Einraumbente,  
Posted by: "David Heaf" david@dheaf.plus.com davidheaf  
Fri Jun 17, 2011 7:16 pm

Charles wrote: "Still, I don't know that splitting a hive which already has capped swarm cells is really going to be such a disease virulence risk.

I think the argument goes something like this. Colonies normally reproduce by sending off swarms. When a swarm leaves, some pests and pathogens on the bees go with it. This is vertical transmission. If those pests or pathogens kill the colony they generally die out too. There is thus a natural selective pressure on those vectored pests and pathogens not to kill the host. This is selection in the direction of avirulence.

On the other hand, if the colony is reproduced by splitting, some combs and brood go to each of the splits, as well as bees. This is horizontal transmission. Each split has not only the pest/pathogen burden vectored on the bees, but also the burden in the combs and brood. By splitting, we by-pass the selective pressure that is exerted on the vertical line of transmission of disease. Splits become more splits in the following year and so on, and there is less 'incentive' for the pathogens/pests to reduce their virulence. Indeed, quite the opposite. The more progeny they can produce, the more they will pass on along the 'chain reaction' of splits. If they overdo it and the colony fails, that is no great problem as there exist other splits from the colony and anyway the beekeeper may use the combs for another colony.

This is probably written up in a clearer way elsewhere, but this is my current understanding of the process.

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David Heaf North-West Wales, UK  
Warr & 'National' hives at 30 metres OMSL  
Warr beekeeping English web portal:  
<http://warre.biobeas.com/index.html>  
David Heaf's beekeeping pages:  
<http://www.bee-friendly.co.uk>

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Re: Timing Spring Splits  
Posted by: "deknow@netzero.net" deknow@netzero.com deknoww  
Mon Nov 7, 2011 7:08 am (PST)

-Ideally, you find swarm cells, and they are separable from one another, at least enough to do the number of splits you are looking to do. Unfortunately, there is a period of time (days 10-12 after the egg is laid) where the cell is capped, and the queen larvae (well, pupae) is very sensitive to being damaged....if you've shaken the bees off the frame and then found the capped queen cells tucked in the corners (as they often are), you may have damaged her wings, legs, or other development.

-It is much better to be early rather than late...you'd rather split before the ideal time than after they swarm.

-By opening up the brood nest (and honey stores), you can reduce the possibility of swarming \_and\_ produce honey. Essentially, if you don't subscribe to "sugar in, honey out" production practice, this is what a beekeeper does....divert the energy that would go into swarming into honey production. Honey production is not everyone's goal, but swarm prevention is a side effect of producing honey, and should be considered.

-As far as hive strength before splitting goes, that largely depends on your goals. If you want to make the most number of splits possible (either to increase colony numbers or to produce/test more individual queens), you want to wait until the hives you are going to split are at their strongest...figuring the amount of brood can double every 3 weeks as the colony is growing, a hive with 5 frames of brood that you might split in 2 could have 10 frames of brood that you could push and make 5 nucs if you wait 3 weeks....of course this assumes the hive is growing (right time of year, strong enough to grow, not compromised by disease).

-IMHO, walk away splits are great....but there is a lot to be gained by looking at some other options....ie. if you rear queens from your best hives to give to the splits, you can split the hives with the genetics you \_dnt\_ want, and keep your better stock producing honey and producing queens. In any case, when you do a walk away split a queen must be produced (about 3 weeks), emerge/mate/start laying (1 week? 2 weeks?), and only then can her new offspring begin to develop, only emerging in the colony in another 3 weeks...so about 2 months of declining population. If you introduce a ripe cell or virgin queen, you shave a valuable 3 weeks off of this time....especially for those of us with a fairly short season. If you don't have a good number of hives and drawn comb to work with, walk away splits are expensive. It isn't hard to rear a few queens (whether you want to graft or not), and the payoff is huge.

If I understand your thinking, I would recommend trying to produce some honey (and do the opening up/swarm prevention that goes along with it), and keep some equipment prepared for making splits for times when you find queen cells....make your splits then. -deknow

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01/17/20123 - Bernhard H. and Mike B.

If you expand from one to five hives, use swarms. Expansion up to twenty, fifty, hundred hives you do with splits, simply for practical purposes. From what I have seen there is no real difference in health in a swarm or split ( if done bee wise). I know there is horizontal vs. vertical transmission of pathogens. But there is anyway horizontal transmission if you keep more than one hive in an apiary.

Splits per box work very well with Warré hives. Split one hive twice a year. But if you expand to say hundred hives, splits per frame is faster and less costly.

Bernhard

Depends entirely on the provenance of the swarms! Nowadays (with the dominance of the 'medical model' of 'husbandry') most swarms originate in beekeeper-dependent hives. Almost certainly not what you want at all.

I'd say something like: if you have good bees, then make increase from the best, otherwise seek out good genetics from wild swarms and non-treating beekeepers. Whether as swarms or as queens doesn't matter too much - mated queens are better of course.

Mike

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### Nucs and Splits

Nucs or Splits are basically the same thing. Splits you make for yourself, nucs you can purchase from another source or beekeeper.

Nucs. To fully understand the term perhaps a description of what constitutes a nuc would be helpful. A nuc or nucleus to give it its full title should consist of 3 or 5 frames of bees, brood, both open and sealed, honey and pollen stores and a laying queen of the current year. Often supplied in a box, sometimes made of cardboard.

Splits A split is basically a nuc, but is taken from a full sized hive and can be made for two main reasons. It is often used as a starter for another hive, to make an increase in holdings, or can be used as a means of population control, supposedly to prevent swarming. This rarely works in practice, two small hives are not as efficient as one large one and there are better ways to prevent the hive from going 'walk about'. See Swarming for further details. As nucs and splits are the same thing I will just refer to nucs from here on, to avoid confusion.

Nucs can be made at any time of the year, but more often early season to allow time for the nuc to become large enough to manage its first winter. The Book says that nucs should be moved at least 3 miles away from the parent yard to prevent loss of bees after the make up. This has the effect of preventing the one-yard beekeeper from making up increase in this fashion, as they haven't the means of placing them 3 miles away. During this article ways will be discussed that will make that rule defunct. So I think a general discussion of nuc making and placement would help.

The mother hive that is selected for the nuc donation should be strong and in good health, with ample stores and bees, with a strong laying queen. In some cases if the donor hive is large enough, then 2 nucs can be made from the same donor hive. It is quite remarkable how quickly a good hive will replace its donation.

As previously stated a nuc needs at least 3 frames, one of brood, sealed, one of open brood and young larvae, and one of stores, a five frame will have two extra frames of brood and stores, one with emerging bees.

If a queen is to be introduced then the nuc should be made up no more than 24 hours before introduction. This is to prevent queen cells being started. There is the danger that any cells started will be allowed to proceed to completion, the emerging virgin then kills the queen you have just introduced. There is a misconception that introduced mated queens will kill any cells she finds, this is incorrect as mated queens do not make it their first job to remove rivals.

Do not be tempted by older beekeepers that give 'advice' on making up queenless nucs, the advice that states "the bees will make their own queen", we refer to these as poor man's splits. This omits the addition of a queen and forces the bees into making their own emergency queen, not recommended. The end product, because of feeding restrictions, will result in an intercaste queen of little long-term value.

Once it is determined which hive should be the donor, making up the nuc is relatively simple. Any box size will suffice, 3 or 5 frames in a 10 or 11 frame box will work provided the frames are pushed well together towards the hive entrance. The ideal addition would be a follower board. This is simply a piece of plywood that is sized to fit on the outside of the frames; it reduces the extra space left by the small amount of frames and can be moved backwards as more frames are added at a later date.

Nucs can be made up to free stand, or be mounted on top of a full sized hive, with the entrance facing in a different direction to the main hive. If the latter, then ventilation is vital and screened openings would allow heat from the hive below to permeate upwards keeping the nuc warmer. It should be noted that the screens should prevent tongue contact between both sets of bees, otherwise they will obtain queen pheromone from the queen below and the nuc bees will then consider themselves queen right and fail to perform correctly. Incidentally the hive below must be queen right otherwise the bees below will abscond into the nuc above as soon as they are queen right.

To overcome the 3-mile rule is relatively simple, a discussion for the reasons will reinforce why it is necessary. Older bees during their first flights will orientate to return to the hive they were born to and flight bees on returning from foraging are keyed to return back where they came from. So making up a nuc with the wrong aged bees will result, just after their first flight, in them returning to the site you took them from, in effect depleting the nuc of older bees. This has two effects. A general decline in population, which can be devastating to brood that without sufficient bees to keep it warm, becomes chilled and dies. Secondly, without flight bees there is no income, the queen's egg laying will be reduced and the nuc will stagnate, waiting until sufficient bees become old enough to forage. This is why feeding a nuc is absolutely vital to its speedy growth. See Feeding.

With the above reasons in mind it then becomes obvious that small nucs with a minimum of older bees, made up in their own yard, are almost certainly doomed to failure. The answer is fairly simple; make up larger nucs to prevent small populations. Bearing in mind the return of older bees, make up the nuc with bees from the middle of the brood nest, as that is where younger bees are, these are bees which haven't left the hive yet, and so don't know where they live. Also where the queen is likely to be, beware, shake in one or two frames from open brood, leaving the queen behind. Even with the loss of some flight bees this should maintain the overall population and prevent it declining until the new brood starts to emerge.

Screen the entrance for 24 hours to prevent flying which will allow time for the bees to realize that they are queenless and also that they are in a different location. Finally on allowing them to fly, drop brush or grass onto the entrance to confuse the flight bees in to noting they have a different entrance and location.

There are a number of reasons to make up nucs, in addition to the ones already stated; the others, which we find most useful, are mating nucs and queen introduction. In both of these cases a young population is ideal as they will accept a different queen more readily than older bees, this can be useful when changing the strain of the hive. In practice we have found a problem when introducing a different strain of bees to a new queen, for example, from Italian to Russian or Buckfast and vice versa, the queens are frequently rejected or superseded by older bees of full sized hives. So to achieve a population of young bees, encourage the flight bees to return home by eliminating the screen, this will allow the flight bees to fly back quickly before you introduce the cell or new queen, which will be accepted quite easily.

Any nuc made up for queen introduction should be allowed to mature until the new queens offspring are emerging, this will ensure on re-uniting via the newspaper method, the nucs acceptance by the big hive. It should go without saying to remove the queen from the full hive first!

Making nucs and splitting a hive is a fairly simple procedure and I would encourage all to use this method of increase, far easier than waiting for other peoples mistakes and cast offs i.e. Swarms to make an increase.

In other areas of our web site I have stated that I only write up one method of control or manipulation. The rule still holds even with this subject, there are many ways of achieving the same result, but to attempt to write them all up would just add to more confusion.

Warre\_Biobees\_Splits <http://www.warre.biobees.com/splits.htm>

Michael Bush: <http://www.bushfarms.com/beessplits.htm>

Saul Creek Apiary: <http://saulcreekapiary.com/Hive%20Split.htm>

The Bee Works: [http://www.beeworks.com/informationcentre/nucs\\_splits.html](http://www.beeworks.com/informationcentre/nucs_splits.html)

Videos: "Google-videos" splits +bees; example = <http://www.youtube.com/watch?v=fveIcR3arjQ>

<http://www.thewarrestore.com/warreebeekkeeping.htm> - then scroll down to the Splits Section - It has exhaustive information on this subject.

Cheers, Karl Schroede Fairbanks, Alaska

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Splitting a good hive before it gets swarming into its head, is the best plan. I have split bees about every way there is, and yes, it works.

Splitting after cells are started is less certain, they may swarm anyway, but at least you get new queens out of the bargain. Make sure both halves get cells, in case the old queen flies off.

I prefer to take a few brood frames at a time and make nucs with them. This can ease the swarm urge, without knocking the hive back so hard.

Depends on the season. Up here in the Northeast bees really like to swarm, whereas when I lived in San Diego, giving plenty of room was usually enough to keep them at home. - PLB

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I like strong splits, like 10 deep frames of bees and drawn comb with an empty box to expand into (or in my case 16 medium frames). In other words, two full deeps of bees during the spring build up is ready to be split. Four eight frame mediums full of bees is ready to be split. Less will not really have the critical mass to build up quickly and reliably. - Michael Bush <http://www.bushfarms.com/beessplits.htm#earllysplit>