Episode 114 Final_mixdown PROOFED

Thu, Sep 08, 2022 9:46AM • 41:59

SUMMARY KEYWORDS

colonies, queens, bees, hive, beekeepers, varroa, small hive beetle, supers, september, swarm, honey, honey bee, sting, combs, honey bees, question, traps, stinger, wax moths, good

SPEAKERS

Jamie, Amy, Stump The Chump, Serra Sowers

Jamie 00:10
Welcome to Two Bees in a Podcast brought to you by the Honey Bee Research Extension Laboratory at the University of Florida's Institute of Food and Agricultural Sciences. It is our goal to advance the understanding of honey bees and beekeeping, grow the beekeeping community and improve the health of honey bees everywhere. In this podcast, you'll hear research updates, beekeeping management practices discussed and advice on beekeeping from our resident experts, beekeepers, scientists and other program guests. Join us for today's program. And thank you for listening to Two Bees in a Podcast.

Amy 00:46
All right, we are in that September monthly management, and Jamie, I honestly can't believe it's September already. Like, where has the year gone?

Jamie 00:54
I know, it's absolutely crazy. We've been doing these monthly management things, and it's just like, every time we meet to record, I feel like eight months passed. So it's crazy.

Amy 01:03
I know. So people have actually been really liking this monthly management series. And I think it just maybe helps beekeepers with identifying what they should consider during this time of year. So I'm happy that we're doing this. But let's go ahead and talk about some of the things that we need to consider in September. So we're going into fall and this is kind of the time of year where the climate changes for everybody, right? So up north, probably in Canada and northern United States and even in the Midwest, the temperature is going to start changing. This is when we start to see fall. So generally speaking, let's kind of talk about the general topics that we should be looking at for monthly management and then we can kind of highlight some of the stuff that beekeepers should really be paying attention to. So let's start with our favorite: Varroa.

Jamie 01:52

Amy, I feel like I'm going to be like a stuck record from July's management all the way through October's management. When you and I were talking about this in pre-show recording, I was like, "Oh, Amy, I don't know if I have anything to talk about because all I'm going to be talking about are the same things I've been talking about the last few months, which are the same things I'll be talking about the next few months, and the first of those is Varroa." July, August, September, and even into October are those critical months for Varroa. Varroa populations are growing, bee populations typically are shrinking, and that kind of creates this scenario where it can be incredibly damaging to your colonies as the colonies begin to make, this new term, these winter bees that need to be strong and healthy. You've got Varroa populations, just huge. You've got the pathogens they spread very prevalent, and you just have to stay on top of Varroa. September's no different. You must monitor for Varroa in September. You've got to treat if you find that you've got three or more Varroa per 100 adult bees. And as you know, we have a strong recommendation that folks look at the Honey Bee Health Coalition website for all that information related to Varroa treatment. And I just want to spend just a second talking specifically about that. A lot of you are listening to us from around the world. And there's this huge continuum of beekeepers listening to us, some of which who don't want to do any type of treatment at all, regardless of what their Varroa population, all the way to the folks on the other end, they'll do whatever it takes to kill Varroa. And what I would argue is the beauty of the Honey Bee Health Coalition is it helps provide answers for all of you across that spectrum. And furthermore, there's that decision support tool, which I think is fantastic. You click on the decision support tool, and you answer questions and it weaves you through, what is your colony doing this time of year? Is it growing? Is it stable? Is it shrinking? Is there brood present? Is there no brood? Are you okay with synthetic acaricides? Would you rather stick to more organic-type options? And it will take your preferences, your colony condition, and your Varroa populations and then feed back to you, through this tree, some options that would really work for you depending on the style of beekeeper you are and the type of approach you want to have. So I don't want to beat this dead horse, right? We talked about Varroa just so much on our podcast over the years, but I'll just say September is no different. You've gotta sample, and if you exceed three mites per 100 bees, you've got to do something about that. And the Honey Bee Health Coalition decision support tool is a really good way to walk you through that decision-making process with regard to treating Varroa.

Amy 04:35
All right, well, I won't make you beat that dead horse. So let's move on to the next.

Jamie 04:40
Good.

Amy 04:40
I was on Facebook the other day and I noticed that there were lots of videos of people just opening their hives and they were full of small hive beetle. And so I did want to talk about that as well. As far as small hive beetle, what are your recommendations?

Jamie 04:54
Yeah, so just like we talked about in July and August about small hive beetles, and we're likely going to talk about in October as well, small hive beetle populations really go up this late summer, early fall. So you can get, in September and October, peak populations of small hive beetles. And I know wherever

you are listening to us around the world, small hive beetles may not be a problem for you. They are a problem in a lot of countries and this is the time of year that they tend to be a big issue. So what we always tell beekeepers is make sure that you are controlling the things that are easier to control, and a lot of you are going to chuckle at me when I say this, but Varroa is slightly easier to control. We have thresholds for Varroa. We know what chemicals we can use, we know how to apply them. So we know Varroa and the viruses that they carry are a significant issue for colonies. So we can address that. So if small hive beetles are much more difficult to control, just making sure that your colonies are strong and healthy is a good major step towards addressing small hive beetles. Why did I mention Varroa? Well, kill Varroa and your colonies are going to be better at managing small hive beetles. Control colony nutrition and make sure they have the resources they need. We'll talk about that in a moment. If colonies are adequately nourished, they're going to be better at controlling small hive beetles. So you really want to address those things that you can address. And then if you see these growing or high small hive beetle populations, you can do things like using any number of the various traps that are available in the market. That happens to be my favorite way to address small hive beetles at the moment, primarily because we don't have good chemical control options for them, and number two, people haven't done a lot with breeding bees for resistance of small hive beetles. So really what's left in our arsenal is just this variety of traps that one has to trap the adult small hive beetles. Like we've talked about in previous management months, and I know we'll talk about even more in October, there are all these traps available. You can put apple cider vinegar in these traps as an attractant, you can put mineral oil or vegetable oil in these traps as killing agents for the small hive beetles, you can put a lot of these traps in colonies. We tend to use traps that kind of hang between two frames at the top of two frames, and we'll put apple cider vinegar and mineral oil in those and we'll have two or more of those traps per box of our hives. So if we have a deep hive body as the brood chamber, we might have two traps there. If we have a medium super as the feed super, two traps there. The colony might have four or more traps. We tend to do that when we're controlling small hive beetles. So to summarize everything I've said, control the things you can control: Varroa, nutrition, queens, all that stuff. And then when you feel like you still have growing or high beetle populations, trap, trap, trap, trap, trap.

Amy 07:49
Yeah, there are sometimes people who use those like Swiffer wipes. I'm not endorsing Swiffer but I don't even know if they're an actual company but Swiffer wipes as wipes. And so what's the idea behind that as far as like small hive beetle go? Because I've seen them like stuck on the wipes but I don't even know what attracts them to it and what happens to them.

Jamie 07:53
They do. Yeah, so those things became really popular a few years ago. And basically what they are is there are various versions of this thing. A lot of them were originally like these little sheets that you'll put in with your clothes in the dryer so that they won't build up static electricity, They make those that don't have a scent, they're not heavily scented. But there are also these kinds of Swiffer duster versions of those type sheets, the kinds of things that you'd use to wipe down surfaces and houses with, also not containing any chemicals or scents. And the idea is you put these little sheets, these little pancake-size sheets into your hive. Usually, they're placed on top of the brood chamber, and the bees, in their efforts to get rid of them, will fluff these things up. And some beekeepers did this 5, 10 years ago now. And they noticed when they would go into their colonies, they would see the small hive beetle stuck in these fibrous fluffed-up sheets and they thought, "Well, the beetles get in there and they get tangled up and

they can't get out." And then there are lots of images circulating on the internet where a lot of people are using these little sheets, these little cleaning cloth or dryer sheets in their hives, and they'll show dozens or hundreds of small hive beetles trapped in those sheets. So there's been a huge push, especially amongst hobbyist beekeepers, to try these out. There's a lot of variety of these sheets available online. If I'm not mistaken, maybe even one or two of the beekeeping equipment companies sell some. But again, it's just got to be chemical-free, it's got to be scent and odor free. If you want to use it, it's a really easy thing to use. There's no good evidence at the moment that honey bees themselves get stuck in it but we know small hive beetles do and they can help tax the beetle population. I stopped short of saying that it rids the colonies of beetles.

Amy 09:52
Right.

Jamie 09:52
But, used in conjunction with traps and all these other things that I've mentioned, any dead beetle is a good beetle, right? So, if you can trap even five or 10 of them, it's better than having those beetles running around in your hives.

Amy 10:06
If they weren't so annoying, I think they were actually kind of cute.

Jamie 10:09
Oh, you listen, my PhD was with small hive beetles, and they have fascinating behaviors. You've heard me talk about bees putting them in prison, the beetles have developed a way to trick bees into feeding them. Biologically, they're really amazing. But of course, they're pesky critters that can overrun weakened colonies. And that's why we have to stay on top of them.

Amy 10:28
Alright, so let's talk about nutrition and feed. This is a question that I've been receiving on emails lately. And so people are basically wondering, should we be feeding? What should we be feeding with? How do we know if we need to feed?

Jamie 10:41
Well, I would argue that, well, let's just start kind of from the top. Really, when we're talking about food with bees, we're talking about carbohydrates, and we're talking about pollen replacements. I would argue, in September, you are less worried about supplementing pollen because this is the time of year when colonies in the northern hemisphere, at least, are starting to prepare for winter. So they are naturally shrinking their brood populations, they're naturally shrinking their overall population, they're not carrying peak population of bees and brood through winter. So providing pollen supplements could inspire, could cause bees to produce, maybe produce copious amounts of brood and bees. And that's not necessarily something you want this time of year. So when we're talking about nutrition management in September, we are primarily talking about carbohydrate management. Of course, the bees see it from the perspective of honey, we see it from the perspective of sugar. So essentially, by the time September rolls around, you're going to have to start determining if colonies have enough food reserves and by food reserves, I mean carbohydrates. So you're going to look in your hive, and you're

going to say, "Do they have enough stored honey?" If they don't, you're going to have to consider feeding this time of year. Usually, there is a small trickle of nectar from many places around the world in September. And that small trickle is enough to get them to survive. We're going to talk a lot about this in October. But October is certainly when you want to make sure they are filled with the food that they need to do winter. So September is kind of that transition month where they're coming out of summer, going into fall. And you're just wanting to make sure that they have ample carbohydrate reserves or reserves to move forward. I'm not saying they have to be fully stored. You don't have to have their complete winner super full of honey by this point. But you're wanting to make sure that there's no complete absence of carbs, in which case, you'll have to feed to do something about that. So I always just go into my colonies this time of year, make sure that they have some stored honey, and note to myself that by the time October rolls around, I'm going to have to make sure they have at least one medium super's worth of stored honey. You don't necessarily need that by September, but you certainly want three, four, or five frames, medium frames of stored honey, just to get them to October, which is when you'll start worrying about having enough food to survive winter.

Amy 13:06
So here in Florida, it's still extremely hot in September. As far as water, we're kind of, I guess we're still in hurricane season here in Florida. But there are other parts of my country, I realized, that don't -- other parts of the world that don't have hurricanes. And so, as far as it being hot and kind of the change in climate, what should we do as far as water to prepare for our bees?

Jamie 13:31
It's funny, you mentioned that. Prior to us pushing the record button on this podcast, you and I were also talking about, in many areas, especially in the northern hemisphere, September represents a cooling-off time. But in Florida, where we live, it's as hot as it's going to be all year throughout the entire month of September. In fact, it's our peak hurricane season in September. It starts June 1, I believe, and goes through November. And September's like when we tend to get our biggest and strongest hurricanes. I know that that's a Florida and East Coast and Gulf-specific thing. And if you're listening to us from around the world, maybe that's not something you have to deal with. But the point that I'm trying to make is it's still incredibly hot for us. So if in September you are living in an area where it's hot, you still have to make sure your bees have good access to clean water. Remember, they collect water, bring it back to the hive, sprinkle droplets of it around the nest, and fan their wings at the nest entrance to evaporate off that water, which helps cool the nest. So you want to make sure that they have access to good clean water, and then they're not having to go to a place you don't want them to go to collect it. That would include your neighbor's pool, bird baths, animal water troughs, things like that. So you may have to provide water to your bees if you otherwise don't live in an area that has access to water. I've done that by filling those entrance feeders, those jars that go on entrance feeders of hives with water and putting it straight on the hives, and that's reduced my bees showing up at my bird feeders or my neighbor's horse watering troughs. A lot of people will set up these tubs in their yard, they'll fill the tubs with rocks, or some floating debris, and then they'll put water in them, and those rocks or that floating debris will allow the bees to have a place to land to collect water and you'll start seeing bees collect water from that. So you've got to make sure that the water they have access to is good, and that it's clean, and again, that it's not an area that you don't want them to go. Just kind of one final note about the clean, if you live in an area that's got heavily polluted water runoff areas like canals or ditches that might collect a lot of pesticides or other environmental contaminants, your bees might end up going to

collect that water and you don't want them to go to that. So you want to make sure that they don't just have access to water, but that it's safe water for them to visit.

Amy 15:54
I always kind of laugh, I chuckle a little bit when people think that they're going to get bees and that they just don't have to do anything, right? Because there's so much maintenance that we have to do.

Jamie 16:04
Oh, it's crazy, yeah.

Amy 16:05
There's so much to consider. And so I'm just cracking up thinking about you talking about just a clean water source and providing them water.

Jamie 16:11
I'll tell you, Amy, when I first moved to where I live in Florida, I've got horse neighbors on both sides of my house. And both of them had water troughs. And I would see, I'd stand at my hives and watch my bees fly straight to their horse watering troughs. And I was like, "Oh, this is a problem." And then we set up a bird bath outside of our kitchen window and we eat kind of in our little dining area, we look out the window and my bees are all over that. And then we've got dogs in the yard and the bees are always visiting their water troughs. So I had, very quickly, to come up with ways to try to keep bees foraging on the water sources I wanted them to forage on rather than the water sources they wanted to go to.

Amy 16:49
Alright, so we've talked about Varroa, we've talked about small hive beetle, we talked about feeding and water. So let's kind of switch gears a little bit to discuss queens and maybe the splitting process. And the reason I bring this up is because I was actually talking to a commercial beekeeper the other day and I asked him to just let me know what his management was for the year. And so I wanted to know his management practices. And he did bring up in September that they split some of their colonies, and so let's talk about this. Should beekeepers be splitting their colonies in September? Is it possible to produce queens at this time of year? What are some of the challenges? And do you recommend this?

Jamie 17:29
So Amy, when I lived up in Georgia, which is for those of you around the world listening outside the United States is actually the state just above Florida where I live and work now. When I lived up in Georgia, I knew commercial beekeepers who would split colonies in September and prepare those colonies to overwinter and be able to sell those splits or be ready to increase their numbers of production colonies by growing those splits. And the reason they wanted to do it in September is because in many areas around the world, you'll get a strong pollen flow in September and October with all of these fall-blooming flowers. You don't usually get a lot of nectar but you can get a lot of pollen, and you can use a lot of that incoming pollen to produce more bees. So, they wanted to make splits for the purpose of being able to get nucleus colonies or nucs to the market early in spring and beat kind of everybody else to the market. So in theory, it is very possible to split colonies this time of year. The catch, and here's the big catch, is whether or not you can get access to queens. Many commercial

queen producers stop producing queens in September, especially if you are in cooler climates around the world. And that's because bee colonies naturally slow down their production of queens, which is very evident because they quit producing drones. It takes drones to mate with queens to produce fertilized eggs, right? And if you don't have drones, that process doesn't work. So while you can often produce queens in September, you can be very limited by the number of drones that are available in your colonies depending on where you live. So for example, here in Florida, we could produce queens, probably, through the month of September, as long as we're ensuring colonies have adequate numbers of drones. But if I were living up in New York, or in Northern Europe, or in Northern Asia, as an example, it might be very difficult to make queens in September; therefore, splitting colonies would be a major no-no because there'd be no way that I could get a queen into those colonies. A lot of folks who I know who split colonies in September might have a queen source from a queen producer who's in a warmer climate so that they can still produce queens and those beekeepers in the cooler climates splitting their colonies in September will purchase those queens from warmer climates. So you can get away with it. But if you're going to do it in your own backyard and your own apiary, you've got to make sure that you've got abundant numbers of drones, otherwise, the whole system might crash on itself. But assuming that you can get a hold of queens, and assuming that you've got an abundant source of drones, then splitting this time of year is something a lot of people like to do. Again, like I said, to beat others to the market in spring, to be able to increase your own colonies going into winter, and, and, and, and. So a lot of folks like to do that this time of year.

Amy 17:45
Sounds good. Alright, so the last thing I wanted to bring up for September monthly management was, we're kind of at the end of the honey flow. And so I know that a lot of beekeepers are harvesting honey right now. They're taking off their supers, do they leave those supers off? Do they add the supers back on? And let's talk a little bit about condensing and really just preparing for fall.

Jamie 20:42
Yes, so Amy, in most of the temperate world, you're going to get that really strong spring honey flow. So if you're in the northern hemisphere, that means you are usually harvesting honey in the month of June. And then in the southern hemisphere, whatever would be that kind of first month of summer for-

Amy 20:59
Don't they get like honey bound, nectar bound?

Jamie 21:01
They can, absolutely, they can fill up with honey. So, what you've got is you got the massive spring flow. That's the time beekeepers will extract that spring flow, usually the month right after it's over for the northern hemisphere, that's June. It would be different in southern hemisphere. Now, usually, you get this kind of dip where there's not much nectar being produced. If you are fortunate to live in an area that you get a summer flow, it is usually, though not always, but usually, the second half of summer, and can bleed into the early part of spring. So the reason we put this in September's monthly management is a lot of you listening to us out there might have had the benefit of having a late summer, marketable honey flow. And the reason I throw that word marketable in there is you can produce some late summer, early fall honey that's just not really good. You just do it for the purpose of feeding bees but you don't have an intention of actually removing and extracting it. Well, some of you

listening out there, when September rolls around, especially early September, you've just gone through a late July, August, early September honey flow that might have been pretty good, maybe not as big as your spring flow, but at least significant enough to where you've made honey that you actually want to extract, bottle, and sell. So if that's the case, usually by the time early September rolls around is when you're taking off of those supers, taking those supers off colonies, and you're starting to extract that honey, and going back to the colony, you're beginning to condense those colonies to get them ready heading into fall. So if you're one of those fortunate beekeepers out there who lives in an area that's full of nectar, kind of in August, early September, then you're going to be dealing with the rewards of that nectar by removing and extracting that honey sometime in September.

Amy 22:50
Do you have recommendations on how to store those frames and supers?

Jamie 22:54
Yeah, so once you extract, I'll tell you what I do. When I extract supers, we call them wet supers. That's what beekeepers call them. When you extract supers, you can't get all the honey off all the comb and off the woodware. You're slinging that stuff around in a centrifuge and it's just kind of flattened honey everywhere. So your supers, your frames, your combs, etc, are what we call wet. You got most of the honey, but there's that little honey residue. I like to put those back on a colony for a day or two because the bees will clean all of that off. And then I will take those now dry supers and put them into storage. More on that in just a second. A second option for wet supers is you can just stack them kind of in a crisscross pattern out in the apiary and the bees from the colonies will come and rob that honey residue off of those combs. The good thing about putting them in the apiary is you don't actually have to open hives and put supers on and then go back and de-bee those supers later. The bad news about putting these wet supers in an apiary is it can cause a robbing frenzy. And furthermore, when bees are kind of robbing the honey from stacked supers in an apiary, a lot of comb can be damaged. Often, when you take those supers up off the pile and you're done, you'll notice piles of wax at the bottom of those supers. So it's cleanest and easiest to do it by putting them onto colonies and letting the colonies clean it up. The downside is you've gotta de-bee them when you put them into storage. So either putting them onto a colony or leaving them out in the open, both of those work but there are pros and cons associated with both of those. Regardless of how you do it, once you have dry supers, they are worth their weight in gold and you want to protect them. So protect them how? Well, you want to protect them from wax moths, and the best way to do that is putting them in a freezer. And I recognize that the vast majority of you, myself included, listening to me out there, we don't have ample freezer space to store our combs. So the next thing a lot of beekeepers will do is they will stack those supers up and try to protect them with some sort of chemical. Here, where we are, that's wax moth crystals. The active ingredient for that is paradichlorobenzene. And you follow the label, you apply it to these supers, and it keeps the wax moths out of those supers as long as the supers are stored kind of tight and those crystals are added when needed throughout the winter months. The final way to protect the supers is wax moths don't like light and significant airflow. So a lot of people will crisscross stack their supers under what I call an open shed. And that would be a shed with a roof, and maybe a side or two that is walled, but that at least two sides are open and so you get good light and airflow under that shed. And that light and airflow can discourage or minimize wax moths in those supers. I will tell you, if you do it that way, you're going to have to check those supers with some regularity to make sure moths aren't moving in and starting damage. And then the second thing about that is if you do that with dark comb, it

doesn't matter if there's lighter airflow, the wax moths are going to take it out so that that kind of crisscross storage pattern under kind of an open shed really only works if you've got white beeswax, not that dark beeswax that has had brood reared in it.

Amy 26:31
Sounds good. All right, so today we talked about Varroa, small hive beetle, feeding, leaving a clean water source, splitting if you want to, but it may be difficult to find queens, and then what to do at the end of your honey nectar flow. Jamie, I've had a couple of people from different states email me asking if they can create their own monthly management calendar. I say, absolutely! Here in Florida, we do have a monthly management calendar that we put out at the beginning of every month. And we have North, Central, and South Florida and basically break it down by region. If you want to work with your local extension office or local state apiarist, or just your local beekeepers association, definitely be sure to pull together a monthly management calendar because I can almost guarantee you many beekeepers will be very thankful for you doing that.

Stump The Chump 27:30
It's everybody's favorite game show, Stump the Chump.

Amy 27:40
Welcome back to the question and answer time. Jamie, the first question that we have, this person has heard that the first emerging queen will sting her unemerged sister. So basically the first queen that comes out, she'll sting the rest of her sisters that are in her cells so she becomes that queen, but then this person is also hearing that queens don't sting. So what does that mean? We have discussed the queen stinger being her ovipositor. But are all these things true? And if they are true, how are they all true?

Jamie 28:13
I love this question. And the reason I love this question is I love it when people get pieces of information, different pieces of information from different sources that are all correct. And then they're like, "Now, wait a minute, these things don't reconcile in my head." And so it gives me this opportunity to say how all of these things can simultaneously be true. So there are basically three questions here. Does a queen sting? Is the stinger her ovipositor? If she doesn't sting, how does she sting her sisters by not stinging? So let's unpack all of that. And I'm going to kind of start at the top. The queen's sting is not her ovipositor. So let me just explain what all of that means. Ovipositior means egg-laying device. All right. Bees, including honey bees belong to an order of insects called Hymenoptera. Hymen is Greek for membrane, Optera is Greek for wings, so it means membranous wing. So Hymenoptera are insects with wings that are like membranes, and in that group are bees, wasps, and ants. Now, this is where it gets tricky. But originally, this group, the females would have had stingers, not for stinging, but for laying eggs. They would poke that stinger into something and lay an egg through that sting shaft. A lot of parasitic wasps still do this. They will sting their prey, not with venom, but sting it and lay an egg inside the body of their prey. But out of that, other things developed in other bees, wasps, and ants, where they no longer needed to oviposit or lay their eggs through their sting shaft, they can lay their eggs in other ways, as their bodies began to change, and the sting became a defense organ. So in honey bees, the sting is a defense organ. It was originally, in the ancestors of honey bees, used to lay eggs, but now in honey bees, it's used to defend themselves and their colonies. So a queen does not

lay eggs through her sting anymore. It is a defense or an offensive weapon for that matter. So it is not her ovipositor anymore. It is derived from an ovipositor, but she does not use it to lay eggs. So, that's the first piece of information you need to know. The second piece of information you need to know is that queens do in fact sting. I have been stung dozens of times by queens by picking up and handling queens so they are very capable of stinging. The key about queens is they don't lose their stinger. If you look at a worker bee stinger under a microscope, their stinger has pronounced barbs so when a worker stings you and pulls away, those barbs stay stuck in your skin, and the worker bee pulls away, because there's this sting shaft stuck in your skin, she pulls away, it pulls out the tissue associated with the sting shaft so what's left behind in you is tissue and the sting shaft. Queens' stingers, when you look at them under a microscope, are also barbed, contrary to popular myth that says they're not barbed. It's just that those barbs are very reduced, which means when a queen stings you, the barbs don't hang in your skin. She can pull that stinger out a lot more like a yellow jacket or another wasp than a worker honey bee. So a queen can sting you multiple times. And queens use their stingers all the time when they are first born. And that's to kill their developing sisters in the cells. They'll bite holes in the walls of the cells, they'll stick their abdomen in there and sting their developing sisters to death, and they can remove those stingers right out of their developing sisters because of the small, reduced barbs. So it's not her ovipositor. She can sting, and she does use that sting to defend herself from other queens, but also to kill her developing sisters when she first emerges from cell.

Amy 30:09
Wait, so why don't we get stung by queens more often?

Jamie 32:28
Because they are very reluctant to sting. That's actually a very good question. So I've handled, oh gosh, at this point in my career, thousands and thousands of queens, and probably only been stung by 20 to 30.

Amy 32:40
Yeah.

Jamie 32:42
They're just very reluctant to sting. As a defense mechanism, they don't use sting that much. Now, as an offensive mechanism, they use them a fair amount. What's the difference between the two? Well, the queens, when I pick them up, do not usually try to defend themselves, but they will use them on the offensive when they're born because they use it to go kill their sisters before their sisters even have a chance to do anything in return. But from a defensive perspective, queens don't use their stingers very much.

Amy 33:12
All right, so the second question, so this beekeeper has purchased a sensor to basically examine temperature and humidity in the colony. You could probably explain this a little bit better than I can, Jamie. But basically, if a temperature spikes in the colony, that means that there's a swarm that's about to happen, or it's already happened, or is going to happen, I don't know. And so when this person was going through and saw that there was a temperature spike, they assumed that there was a swarm that happened, but when they went into their colony, it looked exactly the same and the old queen was in

there. So I guess, let's talk a little bit about the sensor, first of all, and what that actually means, and should beekeepers be using that? And then, at the same time, is it possible that a new virgin queen swarmed and left the old queen behind? Lots of questions.

Jamie 34:11
I'm only giggling because I'm almost overwhelmed by the amount of questions that are in that question.

Amy 34:17
I'm like, I don't even know how to ask the question. How to start? Ok.

Jamie 34:20
I feel like I'm about to run a marathon. So let me try to start from the top. And if for some reason if I forget or miss something, Amy, feel free to jump in and remind me.

Amy 34:28
That's fine.

Jamie 34:28
But I'll start from the top.

Amy 34:29
Okay.

Jamie 34:30
There is a growing use of technology in the honey bee world. I'll start with that statement. And at its base, this is just a very simple idea, that we can put sensors of various types in our hive to assess environmental conditions and make predictions about what the colony is going through at any given moment. So the lowest hanging fruit of all of that is just being able to measure temperature and humidity in a hive. And there's research that has correlated temperature spikes with swarming, right? Prior to colonies swarming, the temperature will go up in the nest, and there's just a real simple biological explanation for that. A large number of bees that are otherwise not ready to fly have to increase their flight muscle temperature in order to be able to fly. And so you get this temperature spike right before a colony swarms. So the beekeeper is saying, "Hey, I was looking at this sensor data, saw a temperature spike, assumed that my colony swarmed, so I'll run out to the apiary to look. And yeah, maybe there are slightly fewer bees. But the the old queen's there and I know that because she's clipped and marked. So did they swarm with a virgin?" And my answer to that is they didn't swarm at all. You just got a false positive probably on your sensor. There are lots of things that can cause temperature spikes. Now, let's just assume for a second that, in fact, it did indicate that the colony was trying to swarm and that even tried, they even flew out. So how can you have found what you found when you went back to the nest? Well, a couple of things that I need to discuss here. First, you had your queen clipped. That is a good insurance policy against swarming. It doesn't stop them from trying to swarm, but it stops them from swarming successfully, so your colony could have tried to swarm. In that case, they would have flown out, your queen would have come out with them, she would have launched into the air as if she was going to fly away. But having been clipped, she'd be unable to fly, she'd hit the ground, and if that's the case, she could have crawled up the hive stand back into the hive

and the bees returned to the nest, and you wouldn't have noticed anything different except that temperature spike on your sensor. So I see this happen all the time because I clip and mark my queens. They'll try to swarm, but they won't, and usually, the first time or two they try to swarm, she will often make it back into the nest. So if you go back hours later, it looks like nothing happened. However, with a clipped queen, a second scenario can happen, which is where she tries to fly out, the bees try to fly out with her, she hits the ground, and she crawls back underneath the hive. And all the bees that were in the swarm flying around in the air, will go back and cluster underneath the hive with her, in which case the parental colony in the original hive says, "Hey, we've swarmed. Let's continue with the process of making a queen," where you've got this swarm with the old queen underneath your hive. And so you explain that you saw the old queen back in the nest, what's the likelihood that they swarmed with a virgin, it's a very low likelihood that they swarm with a virgin when you've got the old queen still in the nest. It's far more likely that either they didn't try to swarm at all and you got a false positive, or this is one of the first one or two times where the queen might have made it back into the hive, in which case they're likely to try to swarm again tomorrow, or the next day, or the next day. So there's a lot to unpack there. But my guess, first, is that it was a false positive, which I think is the strongest of all the explanations, or second, the queen that tried to swarm made it back into the hive, which means she's going to try again tomorrow, or the next day or the next day, which by the time this this question is aired, you will have probably already figured that out because you either would have seen them swarm --

Amy 38:43
Right.

Jamie 38:43
Or the queen would be lost altogether.

Amy 38:44
Well, I was going to say if the listener's out there and hears this episode, be sure to send us a follow-up because I'd love to hear what happened. Thanks for answering that, Jamie. I feel like, as a podcast host, and the question asker, I really failed at asking a question. There was a lot going on with it.

Jamie 39:00
There's so much, you're okay.

Amy 39:02
I have one job.

Jamie 39:05
There was a lot going on in there. That's why I'm saying, it's like well, now we got to talk about swarm biology. And now we got to talk about swarming and now we got to talk about sensors that can detect these things. And so there was a lot there. That's a great question because I don't get asked to talk about technology in colonies and these budding technologies. It could be good, actually, for you and I to have some folks on in the future who have these kinds of bio-sensor backgrounds to be able to tell the beekeepers what's coming their way in the future.

Amy 39:31
Absolutely. So the last question that we have, this beekeeper basically had a dead out and they were putting their frames in the freezer. So after the dead out, they put their frames in the freezer to reuse later on. They pulled those frames out, put them in a colony, put them in a hive, and when they reused those frames, those colonies later got really bad small hive beetle. And this person is basically wondering, is it possible for the small hive beetle eggs to survive through that freezer time? And so is it a possibility? Was this just a huge coincidence? Can we reuse frames after they've been frozen for a couple of weeks?

Jamie 40:13
100% pure coincidence, that's what it is. Freezing frames for a couple of weeks will absolutely kill the small hive beetle eggs in those combs. It wouldn't be a problem to reuse those combs at all. And I think what you're seeing is just a pure coincidence. Storing frames this way, first of all, is a good way to do things, right? You want to make sure and kill small hive beetles or wax moths, and I think they even mentioned wax moths at the end. So absolutely the right thing to do, and you can reuse those combs later. Not a problem at all. That's why I think it's just 100% coincidence that you got small hive beetle in those hives. Frankly, if small hive beetle is in an area, they're going to get into every colony anyway. So it's just one of those things that was probably inevitable, and I would argue had no link at all to your combs being frozen and returned back a hive. I'd keep doing what you're doing and not worry about that part at all.

Amy 41:08
Sounds good. All right, listeners. If you have other questions, feel free to reach out to us. Email is the best way to contact us. So feel free to email us with your questions and hopefully, we can answer them on air.

Serra Sowers 41:21
Thank you for listening to Two Bees in a Podcast. For more information and resources on today's episode, check out the Honey Bee Research Lab website at UFhoneybee.com. If you have questions you want answered on air, email them to us at honeybee@ifas.ufl.edu or message us on social media at UF honey bee lab on Instagram, Facebook and Twitter. This episode was hosted by Jamie Ellis and Amy Vu. This podcast is produced and edited by Amy Vu and Serra Sowers. Thanks for listening and see you next week.