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SPEAKERS

Amy, Jamie, Serra Sowers, Stump The Chump

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 00:48

We are in October, and Jamie, you know what? October in Florida is still pretty warm. I think it's like the end of hurricane season for us. But it's getting pretty chilly in the rest of the world, I think, except for us, just us.

Jamie 01:05

Us and the southern hemisphere. But it's always hot here. It's funny. My family and I just got back from somewhere, and I swear we're from Georgia, and when we crossed the state line into Florida --

Amy 01:18

It got cooler?

Jamie 01:18

It went up 20 degrees. So it got really hot when we got back down here. We're like, "This isn't fair." It's supposed to be fall, but it's just what it is. Right?

Amy 01:27

I know. So let's talk a little bit about just colony and hive apiary maintenance. And so when we're going into October, what do we need to do? What do we need to consider? What are things that we need to look out for? We can start with our favorite pests and diseases. So let's start with Varroa because we haven't done that in every other monthly management. Right?

Jamie 01:48

I keep thinking this is our October monthly management. We probably started talking about Varroa back in March. So it's March, April, May, June, July, August, September.

Amy 01:57

We started in January.

Jamie 01:57

Talking about Varroa, you think?

Amy 02:00

Probably. I don't know. Always.

Jamie 02:02

If we started talking about monitoring and treating for Varroa back in March, it's eight months of you guys hearing us say, Varroa, Varroa, Varroa. So if you've done everything you're supposed to have done by this point, Varroa shouldn't be an issue for you and your colony should be going into winter with low Varroa loads, and therefore, mostly okay. But, if for some reason you have been procrastinating and saying to yourself, well, I'll get to it, I'll get to it, I'll get to it, October is really your last chance to get to it. And I realize that we are speaking to beekeepers from countries all over the world, and October means something so different for you, but where we are in Florida, this is kind of our last chance to address Varroa appropriately. Some of you may have already begun hunkering your hives down for winter. If you're in the coldest regions of the world where your fall started what felt like months ago. But for the rest of you, this is your last chance if you're, especially in the northern hemisphere, if you're heading into winter, November, December, January, then, October is your last chance to get a good handle on Varroa. So monitor the Varroa populations in their colonies. And if they exceed the economic threshold, which is generally believed to be around roughly three mites per 100 adult bees, then you need to do something to knock those Varroa populations back. Amy, you and I are stuck records about this, because we would say if you hit those Varroa numbers, visit the Honey Bee Health Coalition website, look at their tools for Varroa management PDF, their online tool for decision-making and their videos because all of those resources will give you pointers on how to treat Varroa this time of year based on the biological situation that your colony is encountering right now. So monitor for Varroa and if you hit those thresholds, treat, treat treat because your colony may not survive winter if you don't.

Amy 04:12

We always talk about Varroa, and I need to know who out there has actually listened to our podcast and has started monitoring because we've just hit the nail on the head over and over and over. And you know what, Jamie? I think some people feel uncomfortable monitoring or they feel like they don't know how to do that. So I'm putting this out there to the world. If you need help monitoring for Varroa, we have many resources. You can fly me out to come visit you and I will do it for you. I just said that, but now I feel like we probably have to delete that.

Jamie 04:45

You have to go to a fancy restaurant, too, while you're at it.

Amy 04:47

Oh, yeah, of course, of course. But I really feel like there are resources to help people with identifying methods of monitoring for Varroa that they feel comfortable with and so we are here to help you. We have resources. Send us an email if you have questions about that, but monitor Varroa, and treat if you need to. Okay, now I'm gonna get off my tiny stepstool. Let's talk about Nosema. So, Nosema, sometimes I hear about, sometimes I don't hear about. Some beekeepers like to treat colonies for Nosema. What are your thoughts during this time of year?

Jamie 05:22

Amy, my thoughts are complicated with regard to Nosema. When I was just starting to educate beekeepers, years and years ago, it was really kind of formulaic. You treat for Varroa in spring and fall, and you treat for Nosema in spring and fall. And it was just like, you get out fumagillin, it's fall, you just do it, because what you want is you want bees going into winter with low spore loads of Nosema. And Nosema tends to build up over winter because the bees are stuck in their hives and having problems defecating outside the hive and all that kind of stuff. All of these things just really are conducive to growing spore counts of Nosema so that by the time the bees are coming out of late winter, going into early spring, you want to make sure those Nosema counts are low. So you would treat again. It's just formulaic. Spring, fall, spring, fall, spring, fall, spring, fall, just like what we told people for Varroa. Well, it became so much more complicated when a new species of Nosema was identified, *Nosema cerana*, and then very quickly became, at least here in the US, the dominant species of Nosema. And I think many beekeepers around the world would make that similar statement. But the reason my thoughts about this are so complicated is because we're still not sure how bad of a problem *Nosema cerana* is. Some beekeepers and some research papers suggest that it's incredibly bad. If they don't do something about it their bees are going to suffer significantly. Other research projects and beekeepers and scientists suggest, no, it's not really a big deal. And even if it is a big deal, the treatments don't -- the alone treatment doesn't seem to always knock back spore counts. We did two or three Nosema projects when I first got to Florida and couldn't get adequate control of Nosema using one of the available commercial products. So the problem with Nosema is, is it going to be a problem where you are? And even if it is, is the treatment going to be efficacious? Both of those are big, fat question marks. When I first started keeping bees, I was robotic. I treated for Nosema twice a year, which is what I told people to do. Now, we never do it. And I just don't think that we are seeing negative consequences of not doing it. But with that said, there are, especially commercial beekeepers, who will swear that they have to do something or they're going to have big problems. So what do we recommend regarding Nosema in October? If you believe you are getting significant benefits from treating bees for Nosema, then October is a really good time of year to do it because it will help reduce spore loads going into a time of year when colony loss rates are naturally high and Nosema can be a significant problem. So if this is something you do, October is a good time to do it. If you're worried that it's not a value to you or don't know if it's a value to you, just treat half of your colonies this October for Nosema and see what response you get from the treated versus untreated colonies coming out of winter on the other side. But I don't usually make the broad-scale recommendation of, "Just do it." I usually say, "Don't do it unless you believe your spore counts to be really high." And then that opens a whole new can of worms, which is, "Do I have the skill set necessary to determine my spore count and what's a high spore count?" So that's a very wishy-washy recommendation, but it's just not something that I just blatantly say, "You

need to go do it." What I always tell people is if you have reason to believe Nosema is a problem for you, then you should consider treating, and if you do, October is a really good time to get ahead of that.

Amy 09:11

Alright, let's talk about small hive beetles. I think the last time we had a monthly management episode, we talked about small hive beetle and how to kind of monitor and control for them. I got multiple emails from people with pictures of how they controlled small hive beetle. So thank you for sending me pictures of all your dead small hive beetle. That was fantastic and greatly appreciate it.

Jamie 09:32

We love dead small hive beetles here.

Amy 09:34

Yes, we do.

Jamie 09:35

Keep killing them.

Amy 09:36

So what do people need to do if they haven't already monitored and controlled for small hive beetles? What should they do? Or what should they consider doing?

Jamie 09:45

Well, it's interesting. I'm going to speak in an overgeneralization here, but in general, small hive beetle explosions slow down significantly in October, especially if you're in a colder climate, like in the northern part, the North southern half of the northern hemisphere where it gets cool. The small hive beetles are essentially going to be a non-issue for you starting in October. Here in Florida, we're about as bad as it can be for small hive beetles. The conditions are very optimal for the beetle growth and population explosion through September. But even we began to see waning beetle pressures this time of year for us and our bees. And again, I recognize if you're in the southern hemisphere, then you're actually going into spring. But if you're going into spring, then you should probably have low beetle populations anyway. For us in the northern hemisphere, we're going into fall, or at least in October, we're squarely in calendar fall. This time of year, beetle populations just kind of naturally reduce. The likelihood of a colony explosion, I use that term very loosely, meaning that there's just high beetle reproduction, you see larvae everywhere when you go into the colonies, that just really goes down this time of year. But if you're seeing sizable beetle populations when you pop the lid of a colony and you're seeing 20-30 beetles scurry around, then you should consider using beetle traps. There are any number of traps that are available, but I like to have those in my colonies through October if I'm seeing a sizable beetle population because you do want to tax those beetle populations going into winter. But hopefully, you've had those under control through August and September to where it's not much of a big deal for you. So I don't usually worry about beetles as much in October. You do get the occasional population explosion or two. But generally speaking, traps are a good method to keep them low this time of year.

Amy 09:50

So as it starts getting a little cooler outside, we think about the plants and how they start slowing down growth a little bit. When we talk about honey bee nutrition, what do we do about nutrition? Do we need to be feeding and what do we feed with?

Jamie 11:52

Absolutely. So what I would tell you is that October -- the finish line is in sight. If you're in the northern hemisphere, you want your bees to be ready to go into winter by Halloween, October 31. That means their diseases and pests need to be under control. We've just talked about Varroa, Nosema, and small hive beetles. But their nutrition needs to be under control. For most folks, October in the northern hemisphere represents that last pollen and nectar flow that comes from things, at least here where we are, like golden rod. But fall flows are common in a lot of the temperate world. And the issue is they're usually not strong enough to make supers and supers of honey but they're usually just strong enough to give the bees that last push of brood production and that last little bit of weight gain that can carry them a little bit heavier in the winter, which is what you want them to be anyway. But that aside, you cannot rely solely on an October flow to solve all of your feeding woes if your colony is starving. So October is your last month to help those colonies pack on the weight to get ready for winter. And as I say a lot, generally speaking, you want roughly a medium super's worth of honey on every colony for that colony to have enough honey to survive winter. So if you use exclusively shallows, it'd be about a shallow and a half. If you use exclusively deeps, that's roughly two-thirds of a deep. But about a medium super's worth of honey on there. And if you don't have that, you need to feed bees sugar syrup, corn syrup, whatever sugar that you normally feed the bees, most commonly sugar syrup, to get the colonies to pack on that weight. Because once November rolls around, it's often too cold to administer that sugar to bees, and you really want them to be ready for when that cold hits.

Amy 13:53

Alright, so we've talked about pests and diseases, we talked about honey bee nutrition, and the third thing I want to talk about is our queens. So, do we have quality queens at this time? What happens if our colonies kind of crash and we're queenless at this point? Are there ways to get queens at this time? Or what do you recommend?

Jamie 14:12

This is a hard time of year to fix queen problems the two conventional ways, which are allowing bees to make a new queen or to purchase a queen. Why is that the case? Because in most areas in North America, in October, it's not possible for bees to make queens. They've shut down the production of drones, maybe even a couple of months ago, so there are no drones available. So even if they successfully create a queen, the likelihood that she will successfully mate is actually quite small. So you can't usually allow them to make their own queen successfully. So then you have to rely on option number two, which is purchase a queen, and so if your colonies are having a problem producing queens, you can bet queen producers' colonies are having problems producing queens, meaning it's very difficult to buy queens in October. In fact, if you purchase queens in October, they're usually queens that were produced in summer and they've just been held in queen banks, waiting for beekeepers to buy them, which often means just hanging out in queen cages in a functioning colony waiting to be bought. And so it's just difficult to solve queen issues the conventional way, allowing bees to make their own or buying one, in October. So what do you do? Well, I give you two other options, which is, if your colony is queenless and it's on the weaker side, then you just combine it with another

slightly weaker colony, and essentially, cut your losses. You say, "It's more important for me to get those bees through the winter and their combs in the storage than it is for me to allow this kind of weak colony dwindle slowly over winter and potentially lose all the resources and combs and the bees themselves through winter." The second option, which is an option I really like, is to have nucs on hand, nucleus colonies on hand to requeen those queenless full-size colonies. And I have a whole document on that, using nucs in your beekeeping operation, that we can link in the show notes. But essentially, it's you having spare queens on hand yourself in the form of queens that are leading active nucleus colonies. So essentially, you either combine the queenless hive with another one, or you put a queenright nuc into that queenless colony. Those are the two recommendations that I give this time of year with regard to queen management. Now's the time you've got to cut your losses, essentially.

Amy 16:41

So we talked about pests and diseases, we talked about nutrition, we talked about queens. I'm hoping that these monthly managements are actually helping our beekeepers out there. We would love to receive feedback from you about, maybe, what you've heard, and maybe, what you've changed in your operation. So feel free to send us any feedback. If we're missing anything in the monthly managements, let us know. We can always change this and we can always make it work for the beekeepers out there. So any way we can help you with your management practices and helping just foresee the future with your colonies, let us know so that we can help.

Jamie 17:15

Folks, we really love receiving your comments on emails, social media, or even in meetings where we see you guys face-to-face because we do try to make this podcast about you. It's not about me and Amy. We're not getting resources because of this podcast. We're doing this because we want to get information to you so help us know how we can make up things that we haven't talked about or answer questions better. I know, Amy, one of my favorite recent comments about our monthly management segment was actually from a beekeeper in Australia who says, I love the segment, but I'm trying to take your months and make them my months. And that's why I try very hard to shy away from saying things like October and make sure that I say, fall, we're going into fall. So that can translate a little bit better when you meet your fall in the southern hemisphere. So we do our best to try to accommodate beekeepers from all around the world. And it's Amy's pleasure and my pleasure to be able to do this on your behalf.

Stump The Chump 18:14

It's everybody's favorite game show, Stump The Chump.

Amy 18:25

Welcome back to the question and answer segment. Jamie, the first question we have for today, this person is asking about seeds being sown. So basically, seeds being planted over a septic tank drain field. And you're laughing, the person said not to laugh at them.

Jamie 18:42

I'm not laughing at that. I'm laughing because I have a septic tank and know way too much about septic systems as a result of having a septic tank.

Amy 18:51

So we were talking about this earlier. And really, you can't plant tomatoes where the tomatoes would pull anything up and then we would eat it, right? So people are not supposed to consume that type of food that's fertilized with a different type of waste. So what about the seeds that are being sown? Can seeds be planted in a septic tank drain field? Do honey bees, when they forage on these plants, are they taking that back and producing honey with it?

Jamie 19:21

So this is tricky because it's one of those situations where we have more kind of anecdotal information than we do research. I was unable to find any research on this topic. So let me set the stage for the benefit of our listeners, maybe those folks who are not even sure what a septic system is. And so when one lives in a rural area, their house septic system is not usually piped into a shared septic system like what you see in cities. And so we have what we call septic tanks. So I live in a rural area. I'm actually one of these individuals whose waste goes into a septic tank, which is in my particular example, we have a big concrete cube into which our sewer runs from our house and into this tank. It's kind of gross to talk about one's own drain. Nevertheless, it runs from our house and into this tank and it goes around this baffle system where it's supposed to separate out the solids. And then the liquids drain out the other end of the septic tank into what we call a drain field. One of the best management practices for managing drain fields is to not plant anything like trees or shrubs over it or near it because their roots can clog the drain field, which can ultimately lead to a backup in the house, which incidentally, my family experienced years ago after purchasing our house. But the questioner is not really asking about trees or shrubs from the clogging perspective, they're asking about from the general recommendation perspective that folks are told not to plant plants over drain fields, plants that will produce something that we consume, because it can be fertilized with human excrement, right? There's, I guess, some possibility out there that we could be at risk of getting sick from eating fruits or vegetables that are grown, essentially, from fertilization of our own wastes. And so then by extension, is it possible for bees to forage on plants that are grown over a septic field, and that cause a problem for the bees or for the humans? So given that there's no research that I'm aware of on this topic from the pollinator perspective, in fact, when you look on the internet, there are a lot of recommendations to grow wildflowers for pollinators over drain fields because humans can't eat the food grown on drain fields but it would be okay for bees. So in the absence of information, one can only speculate. But I really struggle to imagine a situation that you could grow wildflowers that are pollinator attractants over a drain field and it cause a problem for pollinators at all. So this is one of those things that we certainly need more information about but my knee-jerk reaction is that it's not a problem. I wouldn't overthink it. You can certainly sow some seeds over a drain field and I think it's okay. Now, if you guys are aware of any research out there to the contrary, let me know. But I think even from the human perspective, it's mainly taught as a precaution, rather than, there's a high chance that you're going to get sick. So I think there's an even lower chance when we talk about pollinators. And to extrapolate that even further, especially from a honey bee colony, honey bees need nectar and pollen from huge amounts of flowers over a large area. And so getting it from a small patch on a drain field in your backyard, I mean, I just cannot imagine a scenario where that would pose a big risk to either bees or to us, right?

Amy 22:59

Okay, so the second question we have is, so this person has read that small hive beetles eat bee eggs and larvae and they also puncture cappings to lay eggs in cells with pupating bees. So if that happens,

and one, I guess, does that happen? And then if it does happen, do they become uncapped? And do nurse bees go in and remove the larva? Considering this, is it reasonable to conclude that an infestation of small hive beetles could be the cause behind a spotty brood pattern?

Jamie 23:34

So, yes, yes, yes, yes, yes, yes. All of the questions.

Amy 23:36

Yeah. Like, there's so many questions.

Jamie 23:37

Well, Amy, I'm actually excited about this question because I'm the one who discovered all this stuff. My colleagues and I did when I was a PhD student in South Africa. What I was able to find is that small hive beetle females will bite holes in the cappings of brood cells, they will back up to those holes, and they will stick in their ovipositor. Now, I feel like I have to over explain everything. It's the scientist in me. But essentially, small hive beetles are either male or female, and if you slightly squeeze a small hive beetle, you can sex them. If you squeeze them just right, the females will shoot out a long appendage that is essentially an ovipositor, and that appendage, they can stick into these openings that they bite into the cappings of brood cells, they can stick in this ovipositor and lay eggs within this capped cell. We were able to show through our research, as well, that the females will go into an uncapped empty cell in the brood area. If you think about it, our cells are hexagons. That means a single cell borders six other cells. So a female beetle can go into an empty cell in the brood nest and potentially have access to six cells of brood around her, and she can bite holes in the walls of those cells and lay eggs in six different brood cells beside the developing pupi in that cell. So, my colleagues and I found that, when I was a PhD student, so that led me to take that kind of next logical step, which is, gosh, if they're laying eggs in brood cells, can honey bee workers detect those eggs are the young beetle larvae in those capped brood cells, the same way that they would for Varroa or disease, American foulbrood and infected larvae or chopped brood, infected larvae etc. And so I set up a number of studies, I think two or three, maybe even four, when I was a PhD student, a postdoc looking at, can bees detect beetle eggs in capped brood cells, and open up those cells and abort the developing bees in an attempt to get rid of the eggs and the young beetle larvae? And the answer to that question is yes. We also asked, are there varying levels of response, right? This is just hygienic behavior 101. Are there colonies that are more hygienic towards beetle eggs and larvae than other colonies? And the answer to that was yes, as well. There was another paper my team and I published that showed that we get varying levels of hygienic responses to small hive beetles. So the question then is asking, can hive beetle infestations lead to spotty brood patterns? If bees are detecting eggs, oviposited by small hive beetles amongst these cells? And the answer there is yes. So small hive beetles, in theory, can be one of the contributors to spotty brood patterns. Since worker bees are detecting eggs oviposited in these brood cells and aborting these broods, so yes, the answer to that is yes. Now, I wouldn't say it's a leading cause of spotty brood patterns. I still think that that's probably rooted in other things. Varroa, as an example, but certainly small hive beetle oviposition in capped brood cells can play a role in the production of these spotty brood patterns that we see.

Amy 27:17

That's so interesting. You kind of wonder what the threshold is for nurse bees to detect bees, and is it worth pulling a pupa out versus just leaving it there? Right? I mean, how do they know? How do they determine which ones they actually want to uncap and pull out?

Jamie 27:34

Amy, I think like, is it because they're detecting? Are they capable of detecting one egg or two eggs? Three eggs? Or is it the other way around, in which case it's maybe the pupa producing an, "I'm stressed" scent? So is it the egg or is it the pupa? And what you're asking is what a lot of beekeepers have asked when considering hygienic behavior. Yeah, we can breed bees that are very hygienic to Varroa. But then it just means that our bees or our colonies are producing 50% less brood. So is that really advantageous?

Amy 28:09

Exactly.

Jamie 28:10

So it's an interesting discussion to consider. When I was a postdoc at the University of Georgia in Keith Delaplane's lab, I was very interested in following this hygienic bee as a response to small hive beetle route. When I got hired at Florida, colony losses became kind of the big deal, and I migrated away from small hive beetle work. But it's certainly full of interesting research questions just waiting to be addressed.

Amy 28:36

So let me ask you this. When you were doing your PhD, did you just like pop small hive beetles to see if they were male or female to see if you could get the ovipositor to pop out? I need to try this.

Jamie 28:46

Actually, I did, and I can't take credit for discovering this. There was a gentleman whose last name is Schmolke. And he was doing, I believe, a master's research project at the University of Rhodesia. Rhodesia is the former name for Zimbabwe. He put in his master's thesis, I know he put in his master's thesis a picture that he had drawn of a female small hive beetle and a male small hive beetle when squeezed so that you can see the sex of one or the other. When you work with small hive beetles, you learn very quickly how to sex them because it's important to set up some projects with only females or males or combinations of the two.

Amy 29:32

I mean, obviously, it doesn't kill them if you pop them and the ovipositor comes out. Or does it? I don't know. I have all these questions.

Jamie 29:39

The process of learning how to sex small hive beetles appropriately can lead to the death of small hive beetles. When you are trying to sex the adults, you're usually doing it in a way that you want to keep them alive. But as you can imagine, there's a lot of trial and error and learning how hard is too hard to squeeze beetles when you're trying to determine whether they're males or females. And I always tell people, when you try to sex beetles, one of four things can happen. You squeeze too hard and they

blow up in your hand, you squeeze just right and you find out it's a female, option two, or a male, option three, or you don't squeeze hard enough, in which case, nothing happens at all, and that's option four.

Amy 30:16

And then you have a small hive beetle problem.

Jamie 30:18

Exactly. So if you squeeze too hard, they blow up, if you squeeze just right, male, female, or you don't squeeze hard enough, and you get nothing.

Amy 30:25

There you go. Okay, so for the last question we have, in a past question and answer segment, we talked about how the queen doesn't lay eggs with her stinger. Right? So let's talk a little bit -- this person is basically asking, so how does the queen lay eggs? So can you explain this process?

Jamie 30:43

Yeah, so queen bees have two ovaries, right? The ovaries both have a duct, they each have their own duct that their respective eggs will travel through. So the ovaries are located on the sides of the body. In the science world, this is called, we use the term lateral to explain something that's on the side. So the duct that goes to a given ovary is called a lateral oviduct or lateral or side egg tube, as it were. And these two lateral oviducts, right, so there are two ovaries, so each has its own oviduct. So these two lateral oviducts fuse into a median, a single, central oviduct, we call the median oviduct. It's kind of Y-shaped. If you use your fingers, your pointer and your middle finger to make a Y, those are your two lateral oviducts that fuse into a median oviduct. This median oviduct goes all the way to the end of the queen's abdomen. A lot of people call the end of that median oviduct the vaginal area. So the egg passes through the median oviduct out the vaginal area of the queen. And to the naked eye, it would look a lot like a bird laying an egg. I mean, it would be coming straight out of the vaginal opening at the end of the queen.

Amy 32:11

That's pretty neat. And you know? I think you've discussed this in our master beekeeper program. Isn't there a segment.

Jamie 32:18

Absolutely, there is.

Amy 32:19

Yeah. So I'd encourage all the listeners, if you're interested in knowing a little bit more about honey bee biology in general, sign up for our master beekeeper program. I'm selling the program on this episode, Jamie, because we haven't done that in a while.

Jamie 32:33

Go for it.

Amy 32:35

Alright, so those are our question and answers for today. If you have other questions, feel free to send us an email or send us a message on social media.

Serra Sowers 32:44

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.