EPISODE 200 TRANSCRIPT

Jamie

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.

Hello everyone, and welcome to another episode of Two Bees in a Podcast. I'm giggling because this is going to be new for everybody. We have a very different strategy that we are taking today. We always bring in these bee scientists, beekeepers, bee people from around the US and from around the world, but we often overlook ourselves. Amy and I do a lot more than just Two Bees in a Podcast all day, every day. We actually have our own projects, and every once in a while, we want to highlight some of what we do and how it might be beneficial. So, today, our special guest is actually Miss Amy Vu!

Amy

It's me! I thought you were going to introduce me and say, you know, we normally bring all these bee people, but today we have Amy.

Jamie

Yeah, today we got, womp, womp, Amy Vu.

Amy

Everyone has me today.

Jamie

So, Amy is a state specialized extension agent. You guys know her as one of the two bees in Two Bees in a Podcast. Amy has a lot of things going on. She manages our extension program here at the University of Florida Honey Bee Research and Extension Laboratory. She does an amazing job. You guys know her from the podcast, but Amy and I were talking a few weeks ago, highlighting some of the things that we do as well, because we think some of the things we do are relevant to beekeepers, not just here in the US, but elsewhere. And Amy has one of those projects going. It's just a really good example of the type of things that can be done to help beekeepers. So, Amy, welcome to Two Bees in a Podcast. It's great to have you as a guest.

Amy

Thank you, thank you. Thanks for having me. Do you think people can hear my sarcasm when I'm talking?

Jamie

Do you think they can hear my enthusiasm? So, Amy, in all seriousness, we brought you to talk about an extension program that you have, the title of it is Leveling Up. We're going to get there. But Amy, it's very important to me to treat you like every other guest that we've had on our podcast. And even though I know that people have now heard, I don't know, what is this, by the time this is released, nearly 200 episodes of your voice and my voice, even though people have heard you for years now, could you tell our listeners a little bit about yourself and how you ended up in the beekeeping world anyway?

Amy

Yeah, definitely. I always like to do this minute about myself, even before I give a presentation so people know who I am. But if you've listened to the episodes, I think the last time I really introduced myself, Jamie, was probably at the very beginning of the episodes, like episode one or two. Just a little bit of background for you all. I am from Overland Park, Kansas. I was born and raised in the Midwest, and I received my undergraduate degree from Kansas State University with my degree in agronomy. I focus on soils and environmental science. And so, with agronomy, I was always really interested in food production and where our food came from. This was always a passion of mine, helping people understand where their food came from, food systems and things like that. I ended up receiving my degree at Kansas State and then moving to Virginia Tech to do my master's degree in agricultural extension and leadership community education.

Essentially, I kind of learned formal techniques of working with stakeholders, working with farmers, program planning, and while I was in grad school, I had a group of friends of mine decide we really want a hobby outside of going to classes, going to school, learning about theories and all that good stuff. We decided we should all become beekeepers. We should figure out a way to start two hives. We'll be backyard beekeepers. So, my friends and I came together. We received a grant through the state in Virginia to purchase colonies. It was just a hobby. At the time, I had no idea that I could make a career out of this. It was just for fun. I ended up moving down to Florida after I finished my degree and started working for the University of Florida. I was a county extension agent in Orange County, which is the Orlando area. And so, I worked in that community with gardeners, but also with beekeepers. That's really where my career started with beekeeping. I worked with Mary Bammer. I worked a little bit with you when I was an extension agent there. When the position opened up here, Mary had reached out to me and she said, hey, I think you'd be great in this position, and here we are today. So, I've been here at the Honey Bee Research and Extension Laboratory since 2019. My position has changed a little bit, but I've always done the same thing. I've essentially overseen projects, worked with beekeepers,

identified the needs of beekeepers specifically here in Florida, but also nationwide and internationally. And so, my programs really focus on beekeepers, the stakeholders, and just whatever the need is. It's interesting because every single person who knows me probably has a different version of who I am to them, and I think that probably is what makes an extension agent, just kind of being part of a lot of different projects. But what my job is now is really just being a resource to beekeepers out there and being able to identify what those needs are and then find who I need to find and being able to reach out to who I need to reach out to, to be able to answer some of the questions that these beekeepers have.

Jamie

And Amy, it's obviously very clear that you're a resource to beekeepers, right? We have a lot of people listen to our podcast from all over the world, so they get beekeeping related news and information directly from you. Of course, working at the University of Florida, you have an obligation first to help Florida beekeepers, but you also go beyond that and help national, international beekeepers. You've got a lot of projects we could talk about, the bee colleges, the master beekeeper programs, all sorts of things. But specifically, I'd like to talk with you about a very focused extension program that you have. And of course, listeners outside the US may not be familiar with this term extension, but in this context, it's just partnering with a clientele group, helping them address problems that they identify as priorities so that there are great behavior changes in those clientele groups that lead to condition changes. They make more, their hives are better, etc.

You have one specific project we want to talk about today. This really good project is born out of something called the Beginner Farmer Rancher Development Program. Could you give us a little bit of background about what this project is? You call it Leveling Up. The idea behind it. Just introduce us to where this idea came from and how it links to this thing called the Beginner Farmer Rancher Development Program.

Amy

Yeah, absolutely. So, through the United States Department of Agriculture, there is a National Institute of Food and Agriculture, and within the USDA, that's the US Department of Ag, there are different programs that are provided for farmers and have different focuses on people within the country to help them with all different aspects of Food and Agriculture. So, specifically this program is called the Beginning Farmer and Rancher Development Program, and it is exactly what it says, right It is a program for beginning farmers and ranchers in the United States.

They basically do a call for submission where people can apply for extension programs. And I think historically speaking, a lot of people when they think about research, they think about research funds, they think about the hard sciences, right? They think about the applied research that goes on. But there are programs here in the United States that focus on outreach and

extension, and these extension programs are really just workshops or providing resources, again, to participants that fall under, in this case, beginner farmers. And so, I submitted a grant and received funds. Here in Florida, we have about 5000 registered beekeepers, we have about 3000 hobbyist beekeepers, and that kind of fits under the umbrella of that beginner farmer and rancher. I just thought that this program would be a great program for me to be able to submit a grant to help some of the hobbyist beekeepers out there.

Jamie

That's interesting because I'm thinking, the name of this funding agency, Beginner Farmer and Rancher Development, you've got this funding agency, you could submit this idea too to get funds. And a lot of people out there think, well, gosh, they only give money for research projects just like what you mentioned, but they also give money for extension projects that are aimed specifically at improving the lives of the folks who do this. I know if you're listening around the world, you might have similar types of things. Bringing Amy on to talk about this concept, this idea might inspire you to think of similar strategies to help beekeepers beyond just kind of the hard research where you're trying to find a new Varroa control or a better way to improve nutrition. There are also just other ways to help beekeepers.

So, Amy, as we hone in specifically on your project, can you talk a little bit about the specific objectives of the project? We know the background. What is it that you were wanting to do?

Amy

Yeah, definitely. I'll elaborate a little bit more on what we were talking about as far as the background goes. This program is specific to Florida beekeepers, and I'll talk a bit about how many beekeepers we're actually working with. But a lot of the resources that we have will be available to beekeepers worldwide. So, a lot of the content that we produce, which we'll talk about in a bit, but this is really focused on business planning, which is, again, different than your typical research projects in the honey bee world. So, there aren't that many resources out there for beekeepers that are transitioning from that hobby level to the sideline level and even the sideline level to the commercial level. So, this program is really focused on 4 things.

The first one being business planning. The second one was that I wanted to teach beekeepers how to diversify some of their honey bee value-added products. Then, the third thing that we wanted to look at, especially with where we are today with digital marketing and everything being digital and online, was that we wanted to help those beekeepers with their digital marketing. And then lastly, we wanted to work with teaching them apiary safety. So, just things that you would need to know while you're transitioning and while you're leveling up from wherever you are to the next level that you're trying to get to.

Jamie

I think this is crucial because again, the idea here is that you're not necessarily answering a field-based research question. Beekeepers know how to keep bees, right? So, the job here in this context is you're trying to help them develop new businesses, new strategies, new markets, new whatever. So, the project was funded. You've got this idea. You just outlined your clear objectives. How did you get participants? I mean, did anybody even want to be a part of this program at all? I mean, how did you find these folks?

Amy

Anyone holding workshops will know that either you're going to get 0 people applying for this or you're going to get thousands of people applying. OK, well in this case it was right in between. So, we had about 345 people who applied. What we did was we sent out emails through our listservs. We sent it out through our social media pages. We worked with our Florida Beekeepers Association. We worked with our Department of Agriculture. We essentially did an interview process. So, we went through, made sure that these participants were in it for the program. Just for extension programs, our audience is very targeted and so we decided that we were going to choose 30 participants for this program. They committed to taking part in every single aspect of the program. We had 15 people on the wait list, but we essentially just did a virtual recruitment and then went through and identified 30 participants for this program.

Jamie

I remember you and Mary Bammer, who's helping out with this project, I remember you guys having that difficulty. You could only have 30 participants, but 300+ applied. And I think that's an indication of, honestly, I think it's an indication of need. The whole idea behind extension is you're addressing a need. Well, the need is out there amongst beekeepers who are struggling kind of to this conceptually to get their hobbyist love into this sideline or commercial business. And you know, you guys advertised just here in Florida, and you had so many people want to do it. And imagine if you've done that nationally or internationally. Gosh, it's incredible. So, you clearly hit a very important need, otherwise people wouldn't have wanted to do it. You chose 30 participants. I'm sure that was a difficult process as well. And now you've got 30 people. Walk me through the methods part of this project.

Amy

Yeah, Jamie, we talked a lot about how many people we were going to bring into this cohort. And I know from an outside perspective, 30 people doesn't sound like that much, right? It really doesn't, especially when we have hundreds of people attending some of the other workshops that we have. But with this grant in particular and with these programs and with extension, we look at quality of impacts. So, we don't just look at the number of people who show up. We work one-on-one with these individuals so that they have a personal impact affected from whatever it is they're taking part of.

So, you asked me about the methods and what is required out of this program. So, each of these 30 participants, we've been working with them for two years now, we work with them one-on-one, they all attend monthly Zoom meetings. They are required to take an online course, which I'm really excited to be able to share with everybody at some point. So, after the end of the program, those courses will be available to anybody who wants to take them. We also require them to come to workshops. So, we will bring panels of beekeepers who we feel are setting a great example for the participants in the program, but they basically have a panel to share their own experiences, you know, their successes, their failures, what they've gone through, and then the other things that we've done in workshops. We've just had a lot of fun with the workshops, but the participants will do anything from creating value-added products, that's creating soaps and lip balms and candles and also doing digital marketing. And so, we did a photo shoot with the products that they came up with. And so, these individuals would be able to take these products and use that for their media. So, they take part in workshops. We have multiple workshops. And then the thing that really has taken some time is that one-on-one consultation that I told you about. We work with each and every one of these participants to identify exactly what they're wanting to do with their operation, with their businesses, and then we work with them to try to pull together a business plan, a marketing plan, anything that's going to help them succeed in their own small businesses.

Jamie

Amy, the grant is not over. Nevertheless, I'm curious, are there any notable outcomes that you want to share? Anything that's happened to date that we are seeing? Some really positive trends and that you're able to meet some of those objectives that you outlined early in the project?

Amy

Yeah, absolutely. And I'd love to hear feedback from our listeners to see if any of them have created or have completed any of these things, just to get an idea of participants or people out there who are doing this without a program like ours. But with our workshop, 100% of the participants, 30 people, developed a startup business plan, and we're going to have a comprehensive business plan for every single one of these businesses here.

Another thing that we did was I told you we had the value-added products. Over 90% of them will probably offer a new product for sale, whether they're at a farmers' market, whether they're selling something online, they'll be able to offer something new as a result of this program. We had the digital marketing piece of it, and 70% were able to develop a new marketing product, whether that was a website, whether that was a blog, whether that was a Facebook page. They're able to make and develop new digital marketing products. So, these individuals even took a very intense online course of marketing in a digital era. So, I'm really excited to kind of see what happens from there. As you mentioned, we're still in the process of this program. We still have one more workshop. We're going to work on apiary safety, and so we'll see what the results are

for that. But again, part of the extension program is really highlighting and evaluating the impacts of these programs on the participants as well.

Jamie

Now, I know, Amy, if I was on the outside looking in going, “Oh my gosh, the federal government gave how much money to help 30 people in Florida?” But it's really more than that because I'm very proud of what you and Mary and the other team members have done. You've produced materials that just don't exist. You've produced training opportunities for beekeepers that just don't exist. And so, the question is, you've got all of this stuff, you've trained this cohort of 30 beekeepers to level up, to go from sideline to more of a commercial thought process with value-added hive products, business plans, marketing plans, all of this other stuff. Will any of these great resources that you and Mary and others have created be available to other beekeepers in the US and globally?

Amy

Yes, absolutely. Currently the only thing that is available right now are the value-added product videos. So, that is available on our Honey Bee YouTube channel. If you want to see the very, very basics of creating hive products, there is a whole series of videos that are on there. The other thing I wanted to mention, Jamie, we've talked about this a couple of times, is that a lot of people will think about honey bee research and extension personnel just sharing honey bee research, right? That is part of my job is sharing and connecting beekeepers to scientists and researchers and newest peer reviewed publications.

But then the other part of it is the social piece of it. Beekeepers, yes, absolutely, want the research, but there are other aspects of their operations like that business part, I would say, are equally as important. Again, there haven't been too many resources out there. There have been resources, but we've kind of just condensed and compiled these online courses for beekeepers to be able to have this. So, yes, it will be available. I would say probably at the end of 2025, these short courses will be available to anyone who has access to the Internet.

Jamie

I think that's fantastic. Like you mentioned, the value-added hive product videos are already on our YouTube channel and that's great. It's like, how to make beeswax wraps, how to do this, how to do that, how do you comb honey, chunk honey, liquid honey, all that stuff. You guys have done a very good job. So, that's already internationally available. You can just go to our University of Florida YouTube channel and see those videos. I'm glad that these other resources -- because you guys have done like marketing and business plan development, all these sorts of things and I think beekeepers around the world really want to be able to see and I think that's great. It's really fantastic. And of course, Amy, the way that all of this works, extension and

research, we're doing yesterday's idea, but while we're doing yesterday's idea, we're thinking of tomorrow's project.

So, as you do this project, what are some ideas for follow-up that you have? Where do you think you'll go next? You going to follow this cohort? You going to try to find new cohorts for new enterprise? Are you going to try to spread this program around the country? What are some ideas for follow up you've had?

Amy

So, first of all, yes, I would love to hope that beekeepers that are listening to this podcast do take part in those short courses once they become available. This really was Phase 1 of this project. This was a three-year project. We worked with beekeepers every single month, one-on-one for two years straight. I'm hoping that we'll be able to up the grant and have a phase two. There are a lot of things that we learned from this program. There were a lot of challenges. There were lots of things that we kind of had to change last-minute within the program. I have to give a shout out to all of the other Co-PIs on the project. So, all the other investigators, and all the other specialists that we had on this project. We had Kevin Athern who is a business person. We had John Diaz, who is our evaluation specialist. Of course, Jamie, we had you, we had Cameron and then we had Kimberly Morgan who was kind of our apiary safety management. Without all these people, and of course, Mary Bammer for being the program coordinator on this, we wouldn't have been able to do anything without a great cohort.

But back to some of the challenges that we had, we realized that all the beekeepers had different levels of experience. We wanted to make sure that the beekeepers were able to pull wax, were able to pull honey and had enough for their sales. We weren't focusing on learning how to manage Varroa, things like that. We weren't focusing on that. These beekeepers that came into our program have different specialties, and they're interested in different aspects of our beekeeping industry. So, I think for phase two, what I would love to focus on is maybe providing that technical assistance, so bringing in that research and kind of bringing the beekeeping back into it. So, we'll still have the business planning, we'll still have the marketing, but I would love for these beekeepers to break out into groups. Let's say they want to go into queen production, or they want to go into pollination, or they want to go into managing hives for other people. You know, I think it would be really fun to split that up and really focus on that technical aspect of what they're able to do and really just help them become better beekeepers again with whatever side of the industry they want to take part in.

Jamie

Amy, I just want to thank you so much for being a guest on Two Bees in a Podcast. I guess it sounds funny to say that to you, but I appreciate the time that you spent telling our listeners about this really cool project. I know the listeners out there are like, well, that's so Florida or U-

specific. Well, it's not. It can be motivation for you to find similar funding agencies where you are to do this type of work and develop the resources you need. So, for example, Amy, the budgeting and stuff that you guys would create obviously would be very US-specific because we have our own tax laws, etc. But it could be a good template for others outside the US to do similar things with their own local information. So, it's a good model for how to help beekeepers in a way that maybe we haven't ever considered before when we're usually trying to solve their management issues rather than their business and leveling up issues. So, Amy, do you have any closing thoughts?

Amy

You know, along the lines of what you just said, Jamie, I am happy to share any of my workshops, any of the materials. If you're a club president and you're interested in providing this information to your club, your beekeeping club, if you're a teacher and you're wanting to implement this, I'm happy to share and run ideas with anybody. You can kind of tweak it to whatever works for your own area. So yes, absolutely, this is Florida specific, this program in particular, but the information from it can be used just about anywhere around the world.

Stump the Chump

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

Amy

Welcome back to the question and answer segment. Jamie, the first question is about the Demaree split. And I know that we've had a past Q&A where we did talk about the Demaree split. We had a listener ask, do we recommend that for swarm control? Is it effective? And there are so many questions, but let's start with what is it? And then let's talk about maybe some of the stressors. Do you feel like it's effective or a beekeeper should do this?

Jamie

You know, I've only been asked this question, gosh, in my 20+ years of working with bees and beekeepers, probably only two or three times. So, the Demaree method is a swarm control method that I have never used personally myself. Now, I'm going to give this caveat for saying that I've never used it myself. We almost always do what our mentors taught us to do, and my mentor never taught me to do this. And so, the thing that I do, I feel works pretty well. So, I've never had to do something like the Demaree. The basic premise of the Demaree, if I've read about it correctly, is that imagine a hive that's occupied by a very strong colony, and just for sake of argument, let's just say it's a single deep with a medium super, and there's a queen excluder between the two of those. So, the queen, the brood, everything's downstairs in the single deep. And then there's that queen excluder and the medium super above that excluder is just full of honey for the bees to use year-round. So, the idea of the Demaree is that you would go into your

hive, remove that medium super and set it aside. Now you're in the brood box, that deep box. You take it off of the bottom board and set it aside. Then you put another deep box that's on top of the bottom board and it contains pulled combs. So, no brood, no honey, no pollen, but just pulled combs, like empty combs that have already been pulled. Then you go through the deep that was originally there, find a queen on a frame, take that queen and the frame and put it in that box that you just put on the bottom board of the hive.

So, basically, you're moving the queen to a box full of pulled but empty combs. You're instantly giving her more space to lay eggs. Then, you return the excluder, then you return the medium super, and that original brood box that was on the bottom board originally that had the queen, you now put on top of that medium super, which is all above an excluder. And so, the idea is you've instantly given that queen more space in that bottom box, you've removed that brood chamber from the bottom box to set it on top of the hive, and you allow the bees to emerge out of that top box over the next 25 or so days. It's 24 days for a drone to emerge. So, assuming that last egg that the queen laid was drone right before you remove that box, then waiting 25-26 days should make it where all the brood in that box that you've moved upstairs will have emerged. The idea is that you've given her space, and since restricted space is one of those stimuli that lead to swarming, then you've helped alleviate that swarming tendency.

The other thing you've got to do is, in that upper brood box, you've got to check it at the time that you move it up for queen cells, and you've got to come back seven days later and check it for queen cells. And after that, you know there will be no more queen cells in the upper brood box because the queen's not up there laying eggs. So, you allow that upper brood box to fully emerge. Then you can remove that brood box and maybe do the Demaree method using it on another hive. The premise, again, is you're giving her space. You're cutting queen cells and the brood that you moved upstairs. And doing this should alleviate the swarming tendency. And I know a lot of people who do it. If you go to chat forms online, you see a lot of people talking about it. I'm going to make a dangerous Jamie comment, but it just seems like a lot of work to me when there's other things one can do for swarm control. So, you know, they say, do I recommend it? Well, I don't not recommend it. It's just not something I've ever used and not something I feel like I've had to do. Is it effective? Well, I would argue that people say it is, otherwise they wouldn't do it. It's really just one of those things that you have to try for yourself. To me, it just requires a lot of maintenance, right? You're moving up that brood box, you've got to come back a week later, make sure it's free of queen cells, and then what's to stop that bottom box that you gave the queen from filling up with brood and needing to do it all over again? So, I'm not sure. It's hard for me to wrap my mind around how this would be better than any of the standard swarm control methods.

I know a lot of people are listening to me going, "Well, Jamie, then what do you do?" Swarm control is never easy, Amy. Swarming is one of the strongest drives that honey bees have. Colonies want to swarm. It's colony level reproduction. So, I'm not suggesting that my way is

maintenance-free, but what I typically do is I think about the stimuli that lead to swarming: nest congestion, an older queen, queen cells are kind of that last straw that breaks the camel's back before they swarm, things like that. And I try to alleviate those stimuli, so I ensure that they have adequate space, number one. Number two, I clip my queens. And that's not really swarm control. That's swarm insurance. If you clip your queens and the old queens are the ones that typically swarm, then they can't fly, and you don't lose your swarm. I also go through my production colonies once a week during production season and remove queen cells. I'll go through every frame in the brood box and shake the bees off, look for queen cells, and cut those queens cells off. And if I add space, keep my queens clipped, and remove queen cells every seven to 10 days through honey flow, those are all ways that I use to control swarming. Most of the time, I'm able to do it. Maybe that's not more or less work than the Demaree method. It's just the Demaree method requires extra equipment, special timing, and it's just not something I've ever tried.

I promise, I'm not trying to belittle it. It very well could be everything that people say it is. It just, in my mind, is not the first option I would default to. Of course, a lot of commercial beekeepers just split their colonies. A split is a controlled swarm, and so they try to split their colonies in advance of swarm season to reduce that stimulus.

Amy

So, for the second question that we have today, does feeding too much cause bees to abscond?

Jamie

Yeah, that's an interesting question. I was given that question this past week, and I had to think about what the questioner was meaning about that because they said they heard from someone that if you continuously feed your bees, you'll cause them to abscond. So, what I think they meant or what I think they were told is continuous feeding of bees would cause them to swarm. Let me explain the difference. When a colony absconds, all the bees, queens, drones, workers, all the adult bees leave the nest. It is usually in response to a significant stressor and it's usually not something that you see European-derived honey bee stocks do. I see this commonly amongst African subspecies of honey bees, but less so amongst European subspecies of honey bees.

So, the African subspecies of honey bees, when there's a high, for example, small hive beetle load, they'll just leave, they abscond. They're like, it's better for us to move and find a new nest than to have to put up with this. And I know when we were doing projects with honey bees in South Africa during my PhD days, overworking colonies could cause colonies to abscond. So, the definition of abscond is they're just leaving the nest fully, usually in response to a stressor. Now, some believe that honey bees, especially in Africa, may be migratory, in which case they're these migratory absconding events. But generally speaking, when we talk about absconding, we're talking about leaving the nest in response to a stressor. I don't think overfeeding colonies would cause that. What I suspect the individual talking to the questioner really meant was if you

feed your bees too much, you can cause them to swarm. Unlike absconding, where everybody leaves, a swarm is where only half the colony leaves, right? They're reproducing as a colony, and that swarm goes to try to find a new nest site.

So, how might feeding bees lead to that? Well, one of the stimuli that leads to swarming is available resources in the environment. Bees want to send out swarms when those swarms have the most available resources in the environment, to increase the likelihood that they'll have everything they need to build the wax, to store the honey that they need when they move into this new nest cavity. But if you feed your bees nonstop during winter, they're not going to want to swarm. So, overfeeding really only causes colonies to want to swarm during what one would consider typical swarm season. Maybe spring, maybe summer. You, possibly, can even get it to happen in fall in warmer climates.

Honestly, though, this question has a deeper thought that I have to consider, which is you don't just feed bees to feed bees, you feed bees when they're hungry. I would say there's never a reason to just feed bees all the time anyway. So, really, you're feeding them in response to the lack of food resources or you're trying to get them to do something they otherwise wouldn't do that time of year. So, my point is, if you're feeding heavily, say, in early summer when there's still pollen coming in, yeah, your bees are going to want to swarm. Whereas if you didn't feed them, they wouldn't want to swarm. But they want to swarm in spring anyway, so feeding them doesn't do much then. So, really it seems like a summer/early fall problem. But to me, you should never get to that point because you should only be feeding in response to the need to feed, not just because you think it's time to feed based on some calendar management you typically do.

Amy

So, many of our listeners know that we have breakfast meetings every week and our lab gets together. We talk about research, and we have a student who works with screening for different pests and pathogens here in Florida right now. And one of the things that got brought up was just looking at Nosema and looking at Nosema ceranae versus Nosema apis. I thought it would be fun for us to maybe talk about the differences between the two. So, Jamie, tell us the differences between Nosema ceranae and Nosema apis.

Jamie

That's tough. The reason it's tough is because it's not necessarily something you can see easily, right? The word Nosema in both of their names is the genus name, and then ceranae or apis is the species name. So, the fact that there is a Nosema ceranae and there is a Nosema apis means that someone considers them two different species and there would have been various things, for example, some basic morphometrics, as well as, more importantly, maybe molecular things that differ significantly enough between the two that they would be considered separate species rather than the same species. Now, Nosema is a genus of single-celled fungi that live, in this case, in

honey bee guts for these two species. When I was growing up as a beekeeper, we learned a lot about Nosema apis. And if you read the books that are 20 years old or older, you'll read about Nosema apis, and what you'll commonly hear is that it causes problems for bees, especially coming out of winter. This stuff can build up in their guts. It can compete with bees for nutrition. So, as bees are eating, the Noseema is getting some of the nutrition that the bees are consuming. So, they almost display signs of infection that would be similar to what you might think with starvation. Also, associated with Nosema apis is fecal streaking. At least, people have said that for decades. The idea that this thing is building up in the gut of the bees, it's causing defecation problems. And so, when bees leave their nest, they will defecate the moment they leave the nest, and you'll see these fecal streaks on the face of the hive.

Now, I don't want to chase this rabbit too far, but there's some folks, some scientists who don't believe that fecal streaking is associated with Nosema apis. So, maybe it's never been demonstrated absolutely clearly, but I'm just saying what people have historically said these are the things that you see with Nosema apis. So, colonies that were heavily infected would dwindle for no good reason. It would look like they had food. Everybody else was thriving. There was no good reason for this colony to be dwindling. Again, it typically happened in late winter/early spring. Now contrast that with Nosema ceranae, which is also a single-celled microorganism that lives in the gut of the bee. If you look at apis and ceranae under a microscope, it'd be very difficult to tell the difference between the two without a super powerful microscope.

Nosema ceranae exploded onto the scene, I hate to time it because I forget exactly what year, but in some of those early CCD years when people are going, whoa, this is Nosema, but it's not apis. It's different. It's got a different molecular thumbprint, as it were. And when people started looking, and I can give the US here as an example, they found that it wasn't just a different species, it was the dominant species, so much so that it became more and more prevalent as the Nosema, and Nosema apis became less and less prevalent as the Nosema species that you would see. We just had a master's student here in our lab finish a Florida-wide survey for Nosema ceranae and Nosema apis, and she saw Nosema ceranae in a lot of colonies and Nosena apis, I don't even know if at all, but if at all, it was in very few, but I don't think it was in any. And that just illustrates the point that when Nosema ceranae exploded onto the scene, it really exploded and completely supplanted Nosema apis.

Now, the question is, what does it do? Well, a lot of folks think that it does things to be similar to Nosema apis. The catch is there's groups of scientists who have fed Nosema ceranae to bees in cage studies and don't get a response. And there's groups of scientists, us included, who feed Nosema ceranae to bees and cages, and bees die. There are people who will take it to the next level and feed it the colonies. And look, just because bees have it is not a predictor of bee mortality. Like I said, this master's student here at UF found it in almost every colony. So, every colony should die if it was that bad. So, there's great debate even now in the research literature

how detrimental ceranae is, with some folks saying that it's terrible, some folks saying it's not as bad as you think it is and also struggling to understand the signs of infection.

We do know in both cases, apis and ceranae, when you feed it to bees in the lab, you kill them if it's in high enough numbers. The question is, how does that translate to field level response? So, that was a very quick overview. There's a lot of nuance in that. This is an area of active research given the widespread distribution of Nosema ceranae.

Amy

Sounds good. All right, listeners, if you have questions, you know how to send us your questions. Send it to us on e-mail or one of our social media pages.

Hey everyone, thanks for listening today. We would like to give an extra special thank you to our podcast coordinator, Jeffrey Carmichael. Without his hard work, Two Bees in a Podcast would not be possible.

Jamie

Visit the UF/IFAS Honey Bee Research and Extension Laboratory's website, UFhoneybee.com, for additional information and resources for today's episode. Email any questions that you want answered on air to honeybee@ifas.ufl.edu. You can also submit questions to us on X, Instagram, or Facebook @UFhoneybeelab. Don't forget to follow us while you're visiting our social media sites. Thank you for listening to Two Bees in a Podcast.