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EPISODE 211 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. Today, we are joined by Dr. Jon Zawislak, an Assistant Professor of Apiculture and Urban Entomology in the Department of Entomology and Plant Pathology, University of Arkansas, System Division of Agriculture. Jon, thank you for joining us on today's podcast.

Dr. Jon Zawislak

Thanks for the invitation, Jamie, and it's always good to visit with you. You and I run into each other sometimes at different meetings around the country.

Jamie

I know it's been many years. You and I were talking before we even got on the air. How long has it been? I can't even remember how long ago it was I spoke in Arkansas when we first met.

Dr. Jon Zawislak

I want to say it was probably around 2008 or ‘09.

Jamie

OK, that's about right. It’s been a while.

Dr. Jon Zawislak

Yeah, and I've run into Amy occasionally too. We bee people, we kind of run in the same circles.

Jamie

I know, it's just the way it works. Well, Jon, I'm grateful that you joined us. We brought you on today to talk about your program at the University of Arkansas, as well as specifically the Honey Bee Health book. Before we ever even get there though, Jon, if you don't mind, could you introduce yourself to our audience?

Tell us a little bit about how you got where you are and how you found yourself working with beekeeping and beekeepers.

Dr. Jon Zawislak

Yeah, I probably got into beekeeping completely by accident. When I was a kid, I had some neighbors that had honey bees and they showed them to me one time and I got lit up, got stung 4, 5, 6 times and ran off thinking, man, what demon creatures? I can't believe anybody would willingly subject themselves to that. And who knew it would become a career for me later on. But in college, I studied a lot of different things. But I had a bachelor's degree in botany. And after that, I wasn't sure what I was going to be doing. So, I just answered a random ad for a professor who needed help for the summer in a laboratory. He was in the entomology department. So, we actually worked on spider mites and aphids and cotton pests. But the end of the summer, he asked me if I'd be interested in sticking around and doing some other work. And then after that, he said once you come back next year, and long story short, I worked for him for about 8 years and learned about all kinds of different insects and became really enamored with honey bees in particular. He taught a beekeeping course, and we would catch swarms, and so I had experience with bee hives.

He was an insect pathologist. His name was Dr. Donald Steinkraus. So, he was really interested, actually, in honey bee diseases. So, our apiary inspectors would find abandoned beehives around the state and bring them to him, and he'd put them out here on the experiment station where we worked and he would kind of observe and see what happened to him. So, one of my first introductions is cleaning out nasty old bee hives that nobody had touched in years and putting them back together. So, I kind of got to see the worst side of beekeeping first. But after about 8 years, I had the opportunity to get a master's degree in entomology. And so, I did that, and I decided to work on honey bees and Varroa. Right as I was finishing up, all the headlines about colony collapse disorder started to emerge. Everybody was worried about pollinators and bee health, and what are we going to do? We'll all starve without these bees. And suddenly beekeeping was, you know, really big deal with kind of a sexy thing to study.

Before that, nobody was really terribly interested in bees outside of our industry. You know, honey bees were considered livestock. Kind of like if you were an ornithologist and you chose to study chickens instead of some exotic wild bird, then all of a sudden everybody wanted to study bees. I was getting out of school and everybody else was getting into school looking at bees. And so, I just happened to be at the right place at the right time with just the right credentials and got a job as an Extension Honey Bee Specialist.

After a few years doing that, I got a PhD while I was doing the work. Anyway, I decided to take advantage of that and write it up and get credit for it. So, then they made me a professor. So just an odd series of turns brought me here where I am.

Amy

So, Jon, when we had reached out to you about your extension programs and different publications you have, you had mentioned a book called the Honey Bee Health Book. And what's interesting is when you mentioned it, I realized that I have a copy of that book in my office. I guess I just didn't put two and two together, but it's a great little flip book that you have and it's very popular. The Honey Bee Health Book, this tiny little brown flip book with different things in it. And I was wondering if you could tell our audience a little bit about the book, maybe the background of how you got everything together and the information that beekeepers would expect to find in this book.

Dr. Jon Zawislak

Yeah, that's been a really popular little item. Originally, we had seen the number of cases of European foulbrood going up. And this was kind of after the USDA changed the regulations about antibiotics for livestock and honey bees. So, beekeepers could no longer access antibiotics at their local farm co-op and weren't proactively feeding it to bees. We started to see a kind of resurgence here. So, I wanted to create some little publication on identifying brood diseases, the European foulbrood and American foulbrood and how to tell the difference. And then we decided to add sacbrood and chalkbrood and some other things in there, and it kind of mushroomed from there when you start talking about bee health, and of course there's so many things that are going wrong for bees that it just grew and grew and grew. And we were able to get a nice little grant from the USDA at the time to print these up and give them away. So, that's what we did, and we were able to give them out at a lot of meetings and different places.

So, yeah, they have trickled out all over the country. So, you've even got one at home. So, you're talking about the pocket guide. It's a little 3 by 5-inch spiral bound book and that's the one everybody requests, but we kind of ran out of those. We're going to try to get some more printed, but we also have the same publication available on our website in a regular 8 1/2 by 11 form. But because it's been so popular, we also formatted it for viewing on your smartphone. So, if you go to BeeHealth, it's all one word, BeeHealth.uada.edu, that'll bring up all that same information on your phone in your pocket. And we can update that, of course, anytime there are changes in what's going on.

So, that's been a great little publication, Although, after we printed the initial ones, and you may have one of the first ones, we found a typo in it, embarrassingly enough.

Amy

Of course.

Dr. Jon Zawislak

Of course, it has to do with European foulbrood, the topic that I started writing this for, and a very important word was left out. When you have American foulbrood, then your colonies have to be destroyed. With European foulbrood, they don't need to be destroyed. But the page that talks about European foulbrood, somehow the word not got left out. So, it should say that your hives do not have to be destroyed.

Amy

Oh no.

Jamie

Poor guy.

Dr. Jon Zawislak

And so, it's a horrible embarrassment. If you have that publication, find that paragraph and get yourself a pen and put the word not in there. But we have updated it in all these subsequent issues. So, now it's a collector's item. You know, it's like that postage stamp with the airplane upside down or something like that.

Jamie

Yeah. They call them a misprint. Like a baseball card, those are more valuable.

Dr. Jon Zawislak

Yeah, those are those are the valuable ones.

Jamie

That's right. So, Jon, you've already talked a little bit about updates, but what about, we've got now the yellow-legged hornet, Vespa velutina, here in the US. There's always the threat of Tropilaelaps. It's not here, but people concerned about it, they want to look for it. How do you handle those emerging threats or those new threats with regard to updates of the book.

Dr. Jon Zawislak

Yeah. As we have the digital versions on our website, it's easy to issue those updates. And if we have another emerging threat that really becomes established here, then of course we'll make those changes. As far as the printed versions, probably going to keep handing them out until they're gone and then the next round, we'll change it up.

So, the book that we have, it does mention Tropilaelaps as a potential threat and kind of compares them to Varroa mite. But we don't have a whole lot of information because there just wasn't that much to say about him other than that few years ago, you know, the so-called murder

hornets were all big news. Didn't put that in because they weren't really established yet. And hopefully we've eradicated those, but we'll update things on a kind of an as needed basis.

Amy

So, Jon, I'm going to switch gears a little bit and I really want to talk about the beekeeping industry in Arkansas. Here, I'm the specialized agent in Florida. I know our industry pretty well here, but I'm interested to know, you know, how many beekeepers are in Arkansas? Are they primarily backyard beekeepers, commercial beekeepers? Let's talk about that.

Dr. Jon Zawislak

We have probably a fairly small beekeeping industry compared to Florida. We don't have a lot of real big commercial operations here. We had one, but they actually moved out of state a few years ago. They probably had about 18,000 colonies. But there's just been a lot of changes in the agricultural systems here, particularly with the increased use of herbicides, which seem to be affecting the wild plants, the wildflowers, and what farmers consider weeds, and the removal of all those from the landscape really seem to be impacting the honey production for this particular family. So, they moved their operations to other states.

We have some smaller operations that have anywhere from several hundred to several thousand colonies and they do move them around. They'll go out and pollinate almonds and come back. And we have a lot of agriculture here. So, there's potential to make a decent honey crop when things like soybeans and cotton and things are in bloom. But our state produces a lot of rice. There are corn and things like that that don't really require a lot of honey bees. So, we have beekeepers that benefit from agriculture, but a lot of the crops don't necessarily benefit so much from the bees. But we do have a lot of small acreage, high value fruits and vegetables, melons, peaches, apples, that kind of thing, cucumbers, squash, but it's not nearly the scale that you see in a lot of other states.

Jamie

Now, Jon, you work at a land grant institution, so you would have responsibilities and extension, and you might have even some research projects that you do. So, I'd really like to hear about some of the primary extension programs like, how do you help the beekeepers in your state? You mentioned one of the outputs already, right? You've got this Honey Bee Health Book that you keep updated as needed, but what are other ways that you reach out to beekeepers to address the issues that they have?

Dr. Jon Zawislak

I'm a big believer in the extension mission of land grant universities. I think that that's an amazing resource that this country has to be able to have an organization that addresses public needs and offers resources to them. So, I'm really happy to be part of that. And I'm the first honey

bee specialist that the state of Arkansas has ever had in this kind of position. So, when I started, I was able to kind of create my program from scratch, but at the same time, I had no idea what I was doing. So, it's kind of making it up as I went along. So, when I started, I decided I would just create resources that seem to address the issues that our beekeepers were having. We have a lot of hobbyist beekeepers and some sideliners and a few commercial beekeepers.

But originally, small hive beetles were kind of a new thing here. It was actually the first publication that I wrote was a fact sheet on managing small hive beetles. I think I even have one or two of Jamie's photos in there.

Jamie

Actually, I referenced that document a lot, Jon. So, I send it to people all the time.

Dr. Jon Zawislak

Great. So, yeah, I have kind of a background in journalism and graphic design from earlier in my life, high school and early college and worked on school newspapers. I really enjoy putting information together visually. I'm a real visual person. I think that those skills, which I decided I wasn't going to go into journalism, but I wound up using all of those same skills to be able to put publications like that together, and from there I just did some other ones. We did one on raising queens, which was another topic that we got a lot of questions about. It seems like a very complicated thing when you start looking at the biology, mating biology. I love that book that you and Larry Connor did, Jamie, with the Koeniger's research.

Jamie

Thank you.

Dr. Jon Zawislak

Translated it from German. Yeah, I've read that a couple times, drawn on that a lot. But you know, it's such a complicated thing and there's whole huge books about queen rearing, but I tried to just distill it down into kind of the bare bones. My friend David Burns is the one who taught me how to graft and raise queens. So, I actually asked him to help me out and we wrote that little publication and it turned out to be very popular. You might know about David. He's got a YouTube channel that's very popular. We had a very old publication here when I started and it was really going to be one of the first things I updated. It took me years, but I finally got around to doing that, and we just call it Beekeeping in Arkansas, but it's kind of a basic primer for everything you need to know to get started in beekeeping kind of laid out step by step. That one's also been very popular.

I spent a lot of years traveling all over Arkansas teaching beginning beekeeping classes. It was just one of the most popular programs that we seem to have, and so I wanted to get onto teaching

more advanced topics. But every year we had more and more people interested in beekeeping. So, I ended up teaching the same beginning level classes again and again all over the state and really took up a lot of time. Then, of course, COVID shut down all travel and a lot of in-person meetings. So, we reformatted the class I was teaching into a series of videos. After we were able to get up and get out again, I realized what a blessing in disguise that had been, and it freed up a whole lot of my time to do other things. So that's still available online and we get feedback from people all over the country and really all over the world all the time thanking us for putting that out. So, I've been very pleased. I worked with a great team of people in our communications department who helped to put all that together. But that's also been very popular and that's available to anybody who is interested in getting started with honey bees. It's obviously geared towards getting started in Arkansas in the Mid-South, kind of in our climate, pretty mild winters here. But most of the beekeeping, the bee biology, is the same no matter where you go in the world.

Amy

It's great that it's been able to expand outside of Arkansas and it sounds like it's been very impactful and sounds like you've had great feedback from beekeepers. So, the next question I have is what's next? What's next for you? What do you see as far as some of the programs in the future and what are your plans for your extension programs?

Dr. Jon Zawislak

Well, as an extension specialist, I have 100% extension appointment, so I'm not teaching semester classes and things like that. But my time is split now between apiculture and urban entomology, so I am working a lot in that side of it as well. I have always made myself available to the public, so my e-mail and my phone number are posted on our website. So, I get phone calls and questions from beekeepers all the time, you know, asking me what do I do here? I saw this in my hive, what should I do? These are my plans. So, I'm always happy to visit with people one-on-one. I really enjoy that. And it’s kind of a challenge sometimes to be able to listen to someone describing what they're seeing over the phone and trying to diagnose what their problem might be. Of course, sometimes people say, well, I haven't looked at my hive in three months and now it's dead. What did I do wrong? Well, you know, maybe you should have looked at your hive. It’s always interesting to get questions like that.

But then on the other side of it, with urban entomology, of course, that covers just about any creature, any insect that people would find in or around their home. So, I work a lot with gardeners, Master Gardeners and, and people like that, just homeowners to identify insects. People want to know usually how to get rid of them. But a lot of times we figure out that it's not a problem, it's just a bug that got in your house accidentally.

I work with pesticide applicators. Part of their training is to learn about pollinator safety. We have the Arkansas Monarch Pollinator Partnership here, kind of an effort to enhance pollinator habitat in general more broadly, not just for honey bees, but for butterflies, native bees, also game birds and things like that. We work with Quail Forever and Pheasant Forever and the Arkansas Game and Fish Commission and a bunch of other organizations, with a particular emphasis on providing habitat for the monarch butterfly, which is severely threatened, and just providing the food resources they need for that long term migration. But overall, just trying to improve habitat for that butterfly improves habitat for honey bees and all kinds of other creatures. So, I'm involved with that as well.

Jamie

So, Jon, I really like to ask people who've kind of got boots on the ground and working directly with beekeepers this question, and you've got years of experience, you've seen a lot of the industry nationally. This is an international podcast. We've got beekeepers all over the world listening to us. So, I'm curious, this is that really 30,000-foot view. what are the biggest issues that you think honey bees and beekeeping face in the future? This is you looking forward. What are those big issues that we're going to all have to tackle together?

Dr. Jon Zawislak

I would say probably habitat loss is having a huge impact on all pollinators, but honey bees as well, just the loss of wildflowers as we convert land into urban areas, monoculture agriculture, things like that. We know we cut down forests, which is a very diverse habitat, and then it gets replanted in pine trees every two feet like a cornfield, which is very unnatural. And so just this loss of habitat, loss of diversity, I think, is having a significant impact on honey bees and native bees and really just insects in general, which plays such a key role in our terrestrial ecology.

Anywhere you go, insects are the ones doing all the little dirty jobs. They're recycling nutrients. They're really contributing so much to controlling pests in agriculture and, of course, the pollinators which are so near and dear to my heart in particular.

Amy

So, Jon, I had one last question for you. Earlier, you mentioned something about graphics and design, and I'm also 100% extension and I know the importance of graphics and illustrations and design. I'm just wondering, have you focused a lot of your efforts with graphics and design in your extension programs?

Dr. Jon Zawislak

I've certainly tried to. I think that yes, visuals are such an important part of communicating information. Everybody learns in different ways. I just happen to be a real visual person. And every meeting that you would go to, you know, they would talk about Varroa mites or something,

and you'd see the same life cycle diagrams scanned out of the same journal article or textbook from years ago. So, I decided early on that I was going to try to start producing my own and be a little bit different. And I thought, well, maybe I can improve it and specifically address the details that I wanted. And then, you know, within a couple of years, I would go to some meeting, and I would see someone using my graphics. So, that's pretty flattering in itself. I was being introduced at one meeting by Dewey Caron, and I mentioned to him how much I really liked his book, Honey Bee Biology and Beekeeping. This was the first edition, and he said that he was coming out with a second edition. And so, I just told him that, you know, I do a bit of doodling myself if he was interested. So, I sent some drawings to him and to Larry Connor, and they liked them. Of course, Larry publishes all the beekeeping books through Wicwas Press. So, that started a nice relationship that I still have with Dr. Connor. And since then, I've worked on a number of books for him. Some of his Essential series, did one with his son Andrew Connor, BeeCabulary. Just last year we finished Honey Bee Genetics and Breeding with Robert Page. So that one was interesting. I was even approached by a veterinarian in France who published Honey Bee Veterinary Medicine a few years ago. He asked about some of my work, so I was able to provide some drawings for that as well. So, I've really enjoyed that. And maybe that's where I've kind of made my mark and have been able to stand out, is just being able to provide some visual stuff to go along with all these educational materials.

Jamie

Well, jeez Louise, Jon, I really wish I'd have known this earlier. Amy, how about you? Right? I'm sitting here thinking, going oh my gosh, how many times could I have used someone with knowledge of bees to provide some of the drawings and schematics that we've had over the years. Well, now I know. I appreciate it. Now everybody knows since you're on this podcast. Maybe a lot of people will reach out. Well, Jon, I appreciate the work that you're doing and we're excited to have had you on the podcast. Certainly, you're making significant contributions to honey bee health, beekeepers all around the world, and I really just appreciate you joining us here on this podcast today.

Dr. Jon Zawislak

Well, it's been a pleasure to visit with both of you. Thanks for inviting me, and I'm sure I'll see you around the circuit sooner or later.

Jamie

Thanks, Jon.

Amy

So, Jamie, I love talking to other people who have 100% extension positions because that's my position, and I think that I have the best job in the world. I bet Jon just loves his job. You know,

he was talking to us about this book that he had come up with, but when did you guys meet? Did he say 2008?

Jamie

Yeah, somewhere around there. I spoke in Arkansas like right after I was hired at UF. I was hired in 2006, so it was probably in the first two years I was there, yeah. So, that's when we would have met, and like he said, he and I would have bounced off each other at various meetings throughout the years as we go to the different bee meetings around the country.

Amy

Yeah, that's great. I think, especially for those in the United States, to seek out your extension person because usually, I mean, Jamie, I think there are more 100% extension positions opening up throughout the nation, which I'm kind of excited about. Now, if you can find your extension personnel or whoever it is that's leading workshops and honey bee workshops specifically in your area, I'd be happy to help these individuals find that person as well.

Jamie

Yeah, that's a very important position. Here in the US, we use the term extension. Overseas, they will often use the word extension as well. Sometimes, they call it outreach, but we differentiate between extension and outreach here in the US. But the way it works here, and our listeners have listened to us about this essentially nonstop, is that many of our land grant universities have extension personnel who exist to help beekeepers address beekeeper needs. That can be hive health, it can be production issues, it can be things like helping them know their local rules and regulations regarding honey houses and things like that. And especially new beekeepers can benefit from interacting with these folks around the world, their own extension officers or outreach coordinators, etc., around the world because these people have the local knowledge related to when does bloom happen here? What are the pests and diseases happening here? Of course, Jon spoke specifically from Arkansas. It's great that the Arkansas beekeepers have access to him, but if you're listening to us from somewhere else in the US or somewhere from around the world, find that person who's got that local knowledge. Could be a great resource to you and your beekeeping endeavors.

Stump the Chump

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

Amy

Welcome back to the question-and-answer segment. The questions here that we have today, two of the questions – the first two questions that we have are questions, Jamie, that came from our labs breakfast meeting. You know, I'm always thinking about questions that maybe our audience

would like and maybe they haven't considered. And so I kind of just said it here, thought that we could discuss it as a Q&A and then we can move forward from there. How does that sound?

Jamie

Sounds good to me.

Amy

All right. So, the first question, I remember at breakfast meeting, we were talking about sampling bees and submitting samples for bees. For our listeners out there, there was a report that came out at the beginning of 2025 that said that beekeepers were losing a lot of bees. And so, during that time, we had put a sampling guide together basically letting beekeepers know that they could send samples to us. The question arose, is it better to send in live samples? What about frozen samples? Can you put dead bees in alcohol versus having just dead bees in general? So, I think I know what you're going to say, but let's talk about this on air.

Jamie

Well, we'll see. Hopefully, I don't disappoint. Okay, we as bee educators are often encouraging beekeepers to sample their colonies. And more often than not, when we're saying that, we're usually talking about Varroa sampling, where you do what we would call an alcohol wash, where you put X number of bees in a jar, you throw in some alcohol, you shake the bees, and then you filter out Varroa to determine how many Varroa you have, how many bees you have. And then you can estimate or calculate a Varroa per hundred bees. Using that number, you can make a Varroa management decision. But we as scientists sample bees all the time. And there are different ways that you need to sample. There are different preservatives that you need for fixing the bees for later use, and there are also different areas, and it really varies based on the intent of the project. I will say, if you want to really boil down to like what is the best way to sample bees to make them available for almost anything else that you could consider doing? That would actually be collecting living bees in liquid nitrogen and then storing them at -80°C. And the reason this is so good is when you collect living bees and put them in liquid nitrogen, it freezes them instantly. It stops everything. Liquid nitrogen stops dead bee degradation, it stops everything, gene expression, everything. And when you store them at -80°C, that's the temperature at which DNA won't degrade.

So, if you hold bees at -80, you can keep them really into perpetuity as long as the electricity in the freezer never stops. And the reason you have to freeze them in liquid nitrogen first is because you're probably not going to carry a -80°C with you into the field. These are these really complex freezers. You're not going to carry it with you in the field. And even if you put a bee directly into a -80°C, it's still a slow death that can cause degradation problems. So, freezing in liquid nitrogen stops everything instantly, and then holding them in -80°C preserves them really into perpetuity.

But, of course, that's not what we're going to be asking beekeepers to do. So, often times, with beekeepers, what they do is they'll store them in ethanol. The higher the concentration of ethanol, generally, the better. The lower the concentration of ethanol generally, the worse. You know, bees can still rot in low concentrations of ethanol, for example. So, I keep saying ethanol. Ethanol is the drinking alcohol. That's what's in everybody's liquid that they like to take in, the beers and wines and those kinds of things. But ethanol is not usually available to the general public outside of those things. And the drinking alcohol that one would get usually doesn't have a high enough concentration of ethanol to be very useful. So, we as scientists can purchase near absolute ethanol. So, 200 proof, right? That's like pure ethanol that we can use to store bees. But for the general beekeeper, they might be using isopropyl alcohol. That's the alcohol, that's the rubbing alcohol that you would get at your local pharmacy.

OK, I've really been very technical here. So, freezing is always best if you want to have access to these bees forever. Putting them in ethanol is a really good option for beekeepers. Generally speaking, you want the bees to go into that stuff living because if you are collecting dead bees, the rotting, the degradation has already started, and you may not be able to find the things that you're looking for. Even if you want to do a pesticide residue analysis, you want to freeze those bees quickly because you want to stop the pesticide from further degradation.

Then if you were thinking like, where do I collect bees? Well, if you're wanting to know Varroa loads, you might want to collect bees from the brood nest where Varroa populations tend to be highest. If you want to collect bees for Nosema sampling, you might want to collect bees from the peripheral frames of the nest because those are the older bees in general and they're the ones to have that higher concentration of Nosema. So really, Amy, it all boils down to why are you collecting the sample? And incidentally, we go through that every time we're thinking about collecting samples for research purposes. What is our intent of the use of these bees or the sample? And that will dictate how we collect it, where we collect it, and how we preserve it.

Amy

All right. Thank you for that answer.

Jamie

A lot of nuance, Amy. Was that what you thought was coming your way?

Amy

I know. Yes. There’s so much.

Jamie

Okay, good, good, good, good.

Amy

So, the second question that we have today has to do with viruses and bees. And I think it's hard sometimes to know all the different viruses that bees have. I think that there are so many different viruses that bees have. And sometimes, when you send a sample to a lab, it'll send back either, yes, there is a virus or no, there's not a virus. The presence/absence, right? Then, there's also the different levels of viruses. And so, I wanted to kind of ask you about the differences between the two. You know, obviously there's a difference between whether you have it or not versus how much, but what is the importance of this?

Jamie

This is such an important thing to think through, and I struggle with this myself all the time. So, for example, if a beekeeper's unfamiliar with sampling Varroa, we just talked about sampling. You go collect bees, you put bees in ethanol, you shake them, or soap water or whatever your liquid's going to be, you shake them, you count the Varroa, and there you have it. You've got the dead bees; you can count them. You've got the dead Varroa, you can count them. You can do Varroa per hundred bees super easy. We've got action thresholds. 3 mites per hundred bees means you need to treat. All right. We got all of that. With viruses, we don't have that. With viruses, the best we can tell you is, yes, it's there, no, it's not, the identity of the virus, and if you want to go a little further, we can tell you how much of it's there. But what we don't have is we don't have good thresholds. This amount of virus equals problems in your colony. And beyond that, we don't have treatment recommendations because we don't have treatments for viruses in bees. Now, there are people working on this and they're just around the corner, hopefully. So, a lot of beekeepers say, what benefit is it then to knowing the virus identity or levels at all if there's essentially nothing I can do about it? And I think that's a perfectly valid concern.

I've been a part of lots of surveys and lots of that type of research, especially the post colony collapse disorder years where there was people scrambling to identify viruses and samples and beekeepers were getting these reports that say you've got all of these viruses and they're like, well, you know, it's great, but what am I supposed to do? You know, why is it even important? Well, it is true that for many of the viruses in the honey bee colony there's not a lot one can do, but it's also true for some key viruses there are some things you can do about them.

So, for example, to me, two of those key viruses that pop up into my head are sac brood virus and deformed wing virus. So, sac brood virus is a virus that kills developing bees, you know, the larvae, the pre-pupae, etc. It manifests very similarly to American foulbrood. The clinical signs of both of those diseases are actually quite similar. It's helpful to be able to recognize sac brood and know that it's sac brood because that could keep you from having to burn your colony if you mistakenly identify it as American foulbrood. Also, sac brood is something from which colonies can recover. You can requeen the colony, you can ensure adequate nutrition in the nest, and generally speaking, bees can pull out of sac brood. So, knowing that is quite helpful even if you quote, unquote can't treat for it.

Deformed wing virus is another one of those good examples. Yes, you can't put a treatment in colonies as a control for deformed wing virus. But we all know that Varroa is the key vector of deformed wing virus. So, if you can knock out the vector, you can really impact the manifestation of the problems associated with deformed wing virus. So, if I see a lot of bees with deformed wings in the nest, I know I have high virus titers. If I know I have high virus titers, I know it's because there's lots of Varroa in the nest doing their thing. So, while I can't treat deformed wing virus, I can treat Varroa. Seeing a lot of bees with deformed wings might tell me, hey Jamie, you need to go do something about the Varroa in the nest. So, here are 2 clear examples that knowing that you have the virus in this context actually allows you to do something about it.

But then there's all of these other viruses, right? Israeli acute paralysis virus, Kashmir bee virus, acute bee paralysis virus, chronic bee paralysis virus, Apis filamentous virus, cloudy wing virus, bee virus X, bee virus Y, Lake Sinai Virus. What do you do about all of these things? The truth is, Amy, we don't know because some of these things, acute bee paralysis virus, chronic bee paralysis virus, Israeli acute paralysis virus, we know those things harm bees. We know that if bees have them in appreciable levels, they suffer. Some of these other viruses are kind of mysteries. We know bees get Apis filamentous virus. In fact, we find it a lot. We just don't know what it does to them, right? So, the general recommendations for viruses are to requeen, feed, and control Varroa with a ladder under the guise that hey, we don't know if Varroa are going to spread these things or not but having lots of Varroa in a nest is bad and could make it possible for these other viruses to take hold. So, identification can be helpful. Honestly, there's really two viruses that I feel like I can see manifestations of in the nest and do something about: sac brood and deformed wing virus. All the other ones are very tricky. I get a lot of questions from people who are very confident, I've got chronic bee paralysis virus, or I've got acute bee paralysis virus. What do I do about it? And I always ask them all, how do you know that you've got that? How do you know it's not something else? Illustrating the point that it's so difficult. I know a lot of these virus screening companies will provide these services for beekeepers. The question is what do you do with it? It's always a good recommendation to have good queen stock, manage the nutrition in the nest, and kill Varroa, whether or not you have viruses. But if you think you've got virus problems, then you've got to pay close attention to those.

So, you know, it's tricky. What do you do with the information? But we still do this all the time in our lab, what do we have and how much is there, to inform some of these research decisions that we make.

Amy

Yeah, absolutely. All right. The third question that we have. So, I've been in the beekeeping world for 11 years now and I always hear about Brother Adam. People are talking about Brother Adam, and I know that as a newbie, it's like, who is that? So, the question is, who is Brother Adam and what was his contribution to the beekeeping industry?

Jamie

Yes, if you are in beekeeping any length of time, you're going to hear about Brother Adam. Now, Brother Adam is a Benedictine monk. He was a beekeeper, and he worked at an Abbey called Buckfast Abbey, which is in England, kind of in southwest England. He is a very famous beekeeper monk specifically in that area, but he's written many books. He's deceased now, but he really has a long and a little complex history in the beekeeping world. He's generally viewed very favorably. What he did is he did a lot of breeding efforts for honey bees at Buckfast Abbey and correspondingly produced a line of bees called the Buckfast Bee. He's the originator of this stock of bees. It's a really interesting history.

I've been to Buckfast Abbey twice myself, not when Brother Adam was alive, but I've been able to see all the places that he worked, all the things that he did, things like that. One of the things that he was interested in doing that ultimately resulted in the production of the Buckfast bee is that he was interested in bringing stocks of bees or subspecies of bees, even in his case, of Apis mellifera across it's known distribution that had positive traits, bring them back to Buckfast Abbey, breed them, and create a bee that had positive traits from these different subspecies of Apis mellifera that he encountered in his travels around the world. And he's written books about this and there's plenty of stories about this. And all of this breeding resulted in the production of the Buckfast bee.

He did more than that. He also produced heather honey and created machines that he could use to take heather honey out of the combs. He produced a type of honey liqueur, a honey mead type thing that was kind of known for its medicinal properties in the area. He just was a very interesting and interested in beekeeping individual who has just a very storied past and history. It's really not hard to find out about him. I'm looking even now at a Wikipedia page about Brother Adam, but I know there's books about him, there's books written about him. And it's really worth reading if you're curious about just a really neat story about his history, all the things that he did in his life to produce a better bee and to contribute to the beekeeping industry.

Amy

Interesting. I don't think I've ever read one of his books, so I'll have to do that sometime.

Jamie

Well, they have some at the laboratory.

Amy

Well, I guess I have them available to me.

Jamie

You've got the opportunity just for that.

Amy

All right. Well, thank you everyone for your questions. Don't forget to send us questions through social media. We are on Instagram, Facebook, and X.

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

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