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SPEAKERS

Guest 2, Stump The Chump, Jamie, Amy, Serra Sowers, Guest

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. Hello, everyone, and welcome to another segment of Two Bees in a Podcast. Today, we are talking about something that is very near and dear to me, and that is the Bee Informed Partnership yearly colony loss survey. My team and I spent a lot of time making decisions, research decisions, giving talks to beekeepers all centered around the information that we derive from this colony loss survey. So it's a very important thing that happens here in the US every year, and we are very fortunate to be joined by two individuals who are intimately involved with this survey. The first of those is Dr. Selina Bruckner, who is a Postdoctoral Associate in the Entomology and Plant Pathology Department at Auburn University, and the second is Dr. Nathalie Steinhauer who's the Science Coordinator for the Bee Informed Partnership. Selina and Natalie, thank you so much for joining us on Two Bees in a Podcast.

Guest 01:35
Thank you.

Jamie 01:37
Amy and I are super excited to be able to talk to you guys about this today. The survey is live, and we want to make sure that as many beekeepers as possible go online to complete the survey. But before we get kind of into the weeds of the survey, and what the Bee Informed Partnership does for beekeepers, really not only here in the US, but around the world, Nathalie and Selina, we want to ask you guys a little bit about yourself. So our listeners love to meet the individuals we're interviewing. And so could you tell us a little bit about how you got where you are, how you got involved with bees, and how you ended up involved with the colony loss survey?

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Guest 02:10
Absolutely. So you can probably tell by my accent that I'm not originally from the United States. I actually come from Belgium, and I studied biology there. And I was really looking to find -- I knew I wanted to go in science, I wanted to do a PhD, and at the time I got into beekeeping in my local organization in Brussels. And so yeah, I was very lucky to be able to find a program where I could study bees and honey bee health at the Department of Entomology at University of Maryland. And that's where I did my PhD with Dr. Dennis vanEngelsdorp. And at the time, he was President for Bee Informed Partnership. And yeah, he was working on the survey. So I got to to be able to work on the survey data as part of my PhD.

Guest 2 02:58
And from my side, well, similar to Nathalie, my accent probably also reveals that I'm not American. So I am originally from Switzerland. And I don't really have much of a beekeeping or didn't have much of a beekeeping background, before I got went to university where we had to do a thesis for our undergrad as well. And for me, it was really important to do something applied, something that kind of connects like nature and people. Ultimately, I wanted to save the world. And so I joined the Institute for Bee Health at the University of Bern through my undergrad and then also continued on for my masters, and like most of us, fell in love with bees. And funnily enough, Jeff Williams, who is currently my supervisor, he was actually my supervisor in Switzerland as well, so whenever he got his professor or like his Assistant Professor position in Auburn, he basically invited me to do his my PhD with him. And that's how I ended up in Auburn, Alabama. And Jeff was involved with some research with Dennis vanEngelsdorp before. That's the connection that we had with the Bee Informed Partnership. And I was really happy that I was able to work on the survey for my PhD with Nathalie and the team as well.

Amy 04:29
Very cool. So I think that most of our listeners, I would say that if you've listened to, I don't know, one or two or three episodes, we always talk about the Bee Informed Partnership. So we're always talking about the results from previous Bee Informed Partnership surveys. And so we wanted to bring you on to really highlight and discuss a survey that's just recently come out for this year, so for 2023. Before we get to that, Nathalie, we've had you on the podcast before. We had you on in 2020. Some of our listeners listen from the very beginning, some of our listeners just kind of pick and choose what episodes they want to listen to. So would you be able to tell everyone just a little bit about the Bee Informed Partnership? So what is the Bee Informed Partnership? And what do you all do?

Guest 05:13
Yeah, of course. So the Bee Informed Partnership, we are describing ourselves as a national collaboration effort. We're trying to relate leading research lab at university in agricultural science to really better understand honey bee health questions. So our mission is to improve honey bee health by really supporting beekeepers to make better decisions about their management, using data coming from the beekeepers to inform the beekeepers. And so yeah, we became a nonprofit organization in 2014 thanks to a grant that supported us in our infancy. We were supported by the Department of Agriculture and National Institute of Food and Agriculture, so NIFA grants. And so at the end of that grant, we made the jump and became a nonprofit.

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Amy 06:05
Nathalie, you all are a nonprofit organization. And today we're talking about the survey. But BIP also offers other services, don't they? So can you elaborate a little bit more on the other services that BIP also provides?

Guest 06:17
Yeah, thank you for asking. So there are several programs that we're running, and we really are trying to answer beekeepers needs. So we have a dedicated program that tried to address the needs of commercial beekeepers and the one there that is probably the oldest program that we have along with the loss management survey, it's the Tech Transfer Team Program. So the old Tech Transfer Team is a series of what we call our field specialists. And we have field specialists in all of the big agricultural beekeeper hubs in the country. So everywhere where you have extra variation of commercial beekeepers, you can usually find a Tech Transfer Team. So the Tech Transfer Teams are working in the field with commercial beekeepers to try to help them to monitor their bee health and provide them with relevant information compared to what they see in other operation nearby. So it's all about providing them with a reference of regional information to help beekeepers make decisions based on the health of their colonies. And then other services that we provide, such as, for example, the Sentinel Apiary Program, which is a little more aimed towards smaller scale beekeepers, but also bee clubs and bew organization, and that is also about trying to facilitate the work of beekeepers and convincing them and helping them to monitor their colonies regularly, giving them all of the tools and information that they need to be more confident about their monitoring for pests and disease and to just become better stewards of their colonies. So, Nathalie, let's get a little bit closer to this survey discussion. You guys put out a yearly survey and you collect information from beekeepers, you do a lot of statistical analysis on the results and present really to the US and to other folks around the world a picture of what's going on in our colony loss paradigm here in the US. So as we think about this survey, what are some of the questions, the types of questions that this survey includes?

Amy 08:18
I think that's great. I think that survey fatigue is definitely a thing. And of course, anyone working with people and us, specifically with beekeepers, we don't want to overwhelm them with just providing survey after survey after survey. And so I think that's absolutely fantastic. You mentioned that the beekeepers can complete the survey. So backyard beekeepers, sideliners, and commercial beekeepers can complete the survey. And so I'm wondering, can you explain why it is important for beekeepers to complete the survey?

Guest 08:18
So the Loss and Management Survey, as the name states, it's really divided into two sections. And we tried to keep it as to that. So the last section is really the core of the survey. And it has been really consistent over the years, we've been doing the last survey from 2011. So this is the longest standing effort that we have. And the idea here is to really continue to answer the same questions every year so that we can have this long-term study on estimating the turnover rate of colonies every year, which we call the loss rate. It's really akin to a mortality rate for colonies. That is the first section of the survey, and we're trying to make sure that the questions are really clarified from one year to the next. There might be some changes, but it's really the same core questions. And recently, we've also added some

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more flexibility, in particular for commercial beekeepers about the start of their beekeeping season. So there were some concerns that the April survey was right in the middle of their splits. They were a little uncertain about how to answer questions about splits. So we clarified all of that and provided that flexibility for commercial beekeepers. So the first section of the loss survey is all about colony numbers. What number of colonies do you have a different times of the year? How many splits have you made? How many colonies did you combine? Those type of various numeric questions so that we can estimate the turnover rate of colonies. We also ask other questions in that section such as, "What do you think was the most important cause of colony loss over the winter or summer?" Just to try to get an idea as to what beekeepers consider the leading factors of trust in their in their operation. And then the second section of the survey, the management section is something that we've actually worked a lot in the last three years in collaboration with Auburn University. In the past, we used to have a very comprehensive survey questionnaire where we would ask questions about all different types of management practices, treatment, queens, environments, you name it, we had quite a comprehensive survey. And in order to facilitate the job for beekeepers to take our survey so that it wouldn't take them as long as every year, we decided to actually split it into sections and really have a focus survey that we change the topic of the focus survey every year in rotation, so that we will come back to the same topic every couple of years to try to shorten the survey every given year. So in 2021, we ask question about queens and new colonies. In 2022, we ask questions about environment, nutrition, pollination and weather. And in this year, in 2023, we are focusing most importantly, we are focusing mostly on pests and disease. So everything from prevention to monitoring to intervention itself. So that is going to be the main focus of the management section of the survey this year.

Guest 2 11:54
Yeah, I can. I will answer that question. Part of it, I guess, well, apart from us being super interested in the answers, is being just part of basically, a bigger project. So it's also kind of about ownership a little bit because the survey definitely wouldn't be anything without the beekeepers answering the questions that we have. And as Nathalie mentioned before, I mean, the Bee Informed Partnership Loss and Management Survey is really one of the longest standing monitoring efforts, not only in North America, but actually pretty much around the world. So with this data set, we are kind of able to look at trends and have both colony numbers, but also, how management practices change over time, or how they kind of fluctuate. And we can also detect shifts in those things. Many beekeepers commonly say, "Well, Varroa really changed the way we keep our bees." And by doing such a long-standing monitoring survey, we can actually also detect things like that, where we can see how maybe certain management practices shift depending on what's going on. And yeah, every year that we get answers, we can add more data to this data set and make better and more informed kind of statements about the data. So the more answers we get, the more kind of accurately we can also make statements about basically the beekeeping industry in the US, and that it's definitely good for researchers, because that kind of also informs us as researchers, what's very important to beekeepers, but it can also kind of help beekeepers themselves to understand what's going on in different regions, probably, of the US as well, and just give their input as well, in terms of what research should be conducted in terms of beekeeping. Many labs do more what we call basic research. So they're really interested in like bee biology and whatnot, which is super important. But then there's also very many labs that are more looking into applied research. They're really trying to gear their focus to basically support the beekeepers pretty much practically. The survey really helps to inform about those kinds of needs as well. And finally, I guess the data is really

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also valuable because it kind of works as a barometer, I think that's the correct word, of colony losses across the country. So we just kind of like numerically see how those numbers fluctuate, which is just really interesting and can be tied back to several other factors as well. I think one of the unique things about the BIP survey is also that the data is available publicly on the Bee Informed Partnership website. So I mean, it's anonymous, but everybody can basically go look at the national loss numbers. And there's also a visual summary of the data, which is pretty unique to this survey, which is basically just to help understand, instead of just showing the numbers. There's also like a picture or a visual that helps to describe the results of the survey as well. With every beekeeper that answers, the survey basically puts a little pixel of color on the US map, in terms of data. And I guess that's just part of ownership as well.

Jamie 16:03
So when is the deadline for completion of the survey?

Guest 16:07
The survey is live now from April 1 to April 30. You just need to go to BeeInformed.org and on the front page of the survey, you will have a link that will say, "Click here to take the survey," and it will lead you to the very first page of our survey. So one thing to know is that our survey is what we call retrospective. So that's a fancy word to say that we're covering questions from last April to this April. So when you go and take the survey, you might need to think back about what you did last year. And if you're like me, it might be hard, because I can't even remember what I did last month. But if you keep records, obviously, that will be easiest for you. But you can also see a preview of the questions if you want to prepare a little bit and see those questions in advance before taking the survey.

Amy 16:54
Yeah, and with this podcast episode, we'll be sure to link the BIP survey and the Bee Informed Partnership website. And so anyone who's listening into this podcast can find the website on our additional notes on our website as well. So I wanted to go back real quickly. Selina, I know you kind of answered it with why it's important for beekeepers to complete the survey, but can you elaborate a little bit more on how the information collected from the survey actually is used?

Guest 2 17:24
Yeah, thinking back, I do also think that I already actually kind of touched on several of those things. But I think one very important thing in research is definitely that the data, especially the perception of losses in the United States is really one of the data points that is like, very frequently used to basically justify research. So basically to get funding from different levels, like federal states and universities to actually get money to further investigate honey bee health questions. It's a very well-cited data platform to accumulate money to do actual honey bee research. And, again, I know I did touch on that before, but the survey really also helps to keep challenges that beekeepers face in a public conversation as well. So the Loss and Management Survey is frequently cited also in the news. We release a press release once the survey is closed. And so it really kind of also puts basically the struggles that beekeepers face into the public as well, just to kind of raise awareness as well of that. And definitely, we're also using the answers especially, but Nathalie mentioned before, when we asked about the perception of what beekeepers perceive as a threat to their colonies, that can really drive decision-

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making of researchers to basically allocate their resources to topics that are important to beekeepers. So we really try to gear our research towards the needs that beekeepers might have or concerns that they may might have in terms of their colony health. And there are quite a few, I guess, pathways also to use this data to associate it with other large datasets, which is super cool, such as landscape patterns, or even climate patterns. Those are all really big data sets that also need like big data sets to basically kind of pair them with. Since the BIP Management and Loss Survey has so many years of data available, we can actually also use that to associate with other large data sets and come up with some predictions. Modeling and whatnot are very, very fancy things that other people have to do. And we definitely use the visual data from the surveys regularly in presentations when we go to both academic but also more beekeeping gear targeted, I guess, conferences. So I really think that the visual data or the visualization of the data is probably the most frequently used, I guess, piece of the survey to be honest, because we use it all the time.

Jamie 20:54
So you guys had mentioned that you are modifying the surveys a little bit every year. Could you talk a little bit about what beekeepers can expect from this year's survey?

Guest 21:02
Yeah. So we always try to clarify questions. The idea is really to try to make the interpretation of questions easier for beekeepers. And we always are constantly learning about different ways that beekeepers can sometimes misinterpret a question. So we have definitely learned over the 10+ years that we've organized the survey to try to reduce the noise in our data and to really try to get to the most important and condensed information we can. So the idea is to try to keep the survey as consistent as possible so we can compare through the years, but also to simplify the work for the beekeepers to make it easier for them to answer the questions. And so as I said earlier, this year, again, I think this is the third year in a row where we actually have two different versions of the survey, small-scale version, if you have less than 50 colonies on October 1, that's kind of our definition of small-scale operations. Or if you are what we call the large-scale operator, so if you have more than 50 colonies on October 1, we have a separate version of the survey. And we actually are gathering pretty much the same information but phrasing of the questions and sometimes specific questions that are more relevant for small-scale beekeepers or for large-scale, commercial beekeepers. So there were two versions of the survey, that is decided on the very first question that you will see which, decides whether you could go on the small-scale version or the commercial version. And then past that, after the loss questions themselves, you will go into the management section, which as we said, this year, is going to be mostly focused on pests and diseases. So we will cover topics such as prevention, monitoring treatments, the reason why beekeepers are using one or the other methods. We tried to really understand what is stopping beekeepers from using one method over another because we really realized that in agriculture, there is this notion of IPM, integrated pest management. And even though the science of IPM is not recent in agriculture, it is still in a pretty naive state in beekeeping in some regards. And so we really want to try to identify areas of weakness that future work really needs to dig into and to try to promote IPM. So we want to understand the limitations of why beekeepers are not adopting some practices that have been identified as good practices, try to really understand what's driving those decisions, and how we can help to promote integrated pest management. So that's why we decided to focus on this topic this year.

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Amy 21:03
Yeah, I think that's fantastic. I really appreciate the fact that you're working with the beekeepers, and always changing the survey just a little bit, not major changes, but just a little bit so that it just makes more sense to everybody, and you're constantly working on it. So I think that's really great. I know, Selina and Natalie, both of you have talked about how this survey and information can be used for research to help with identifying some of the needs that the beekeepers have, whether they're small-scale or large-scale, and I'm wondering if you can go into what you've learned from the survey in past years?

Guest 2 24:42
Yeah. Basically, kind of following up of what you just said with the needs of beekeepers, and Nathalie was touching on that as well, the reason why we have basically a specific survey pass for commercial versus small-scale beekeepers is really based on feedback that we received that there is a kind of discrepancy for, especially in large-scale beekeepers to take the survey during a specific time or the dates are not really aligned. So definitely, I think that's one of the learning points is taking feedback on and trying to implement it as best as we can. And as you just said, trying to refine it over the years. And in terms of IPM, or integrated pest management, I think something that I'm super excited about to see is that we also, and I mentioned that in the beginning a little bit, we actually see in the data how some of the, especially IPM, practices have changed over the years. One example is, and every beekeeper that listens is probably aware that we really try to push mites monitoring as much as we can, especially by using alcohol washes, which haven't been very well adopted, like a few years back, but now we can really see in the data that more and more beekeepers are actually using this monitoring method. Really just seeing kind of the change in practices that we are also trying to promote, it's just so cool. It's really amazing to see that, I guess. Something that is a little on a sad note, I guess, is that we definitely still see high colony losses. It fluctuates from year to year. But generally speaking, it's not that just because we know that there is like mites, there's pesticides, other factors that affect our honey bee health, that we still see high losses. So there are just still so many things that we have to better understand and look deeper into. For a shameless plug, we just recently published, well, I guess the most recent paper of the Loss and Management Survey. And we've actually reported the highest winter loss in 2019, I believe, since the start of the survey. So again, definitely, beekeepers are still struggling keeping their colonies alive. And although winter is kind of traditionally the season where most beekeepers lose their their colonies since 2012. Also, included questions to look at summer losses so colonies that are being lost over the summer period, which sometimes it's kind of counterintuitive, because we think like, "Oh, there's so many flowers and whatnot, so you wouldn't lose any colonies." But that's actually not the case. We do see high summer losses. And in fact, in this paper that was just recently published, we also, one year, we've seen higher summer losses compared to winter losses, which is not very common. But that was really interesting to see as well. Looking back, it's important to include many or all the seasons that beekeepers can lose colonies and not just focus on one. So I guess that was definitely something we learned as well is that not only winter is important, but there seems to be factors important in summer as well that can drive losses. And I guess, finally, something that I thought is really interesting, generally, we don't really see a difference in loss rates between beekeepers that migrate throughout the country. So those will be obviously larger beekeepers, for the most part that go, for example, to pollinate almonds, or apples or blueberries or whatnot. Intuitively, I would think that they would potentially experience higher losses because of the transportation and potentially, whatever the

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colonies are exposed in those commercial fields, but we actually don't really see a difference between migratory and stationary beekeepers that don't move the colonies in terms of losses. So I guess that's something to to basically investigate further as well. So yeah, we definitely learn a lot with every year that the survey goes on as well.

Jamie 29:48
Selina, Nathalie, thank you guys so much for joining us on Two Bees in a Podcast and talking about the importance of the colony loss rate survey. It's very important, I think, that beekeepers go and complete it for all the reasons that you guys just stated because we really need that information. It really helps shapes shape our extension and research and even our teaching programs and universities based on the information that you guys get. So where can they find that survey again?

Guest 30:12
You can go find the survey right now at BeeInformed.org

Jamie 30:16
We'll make sure and link to that in the show notes. And thank you guys so much.

Guest 2 30:20
Thank you for having us.

Amy 30:32
So Jamie, I was thinking as Nathalie and Selina were on the call, like every time we have -- not every time -- but a lot of times when we have guest speakers, they talk about how they've been field coordinator or like part of the Tech Transfer Team. And lots of the beekeepers, I think, around our nation are very familiar about the Bee Informed Partnership, the work that they do, they've been involved somehow, or they've heard of it, or they've interacted with someone from it. And so I think it's always just really fun. I'm so happy to promote their survey in our podcast.

Jamie 31:03
Well, we use their information all the time. The Bee Informed Partnership was really kind of born out of those early years of colony losses. And we were trying to get a handle on what the loss rates were. So Dennis vanEngelsdorp and colleagues at the University of Maryland and then others kind of created this organization that, as Nathalie or Selina had mentioned, is now a nonprofit. Really, bee scientists around the world are aware of the data from the Bee Informed Partnership. And certainly, beekeepers and bee scientists in the United States are. We use the data all the time because we are always using it to highlight what beekeepers are saying are the principal stressors of bee colonies. And the benefit of knowing that is you can cater your research program to address those things that beekeepers say are problems for them. You can cater your teaching programs and your extension programs to these very same issues. And you have to get those data somewhere. And it's really good to have an organization like the Bee Informed Partnership to provide those colony loss surveys. But I'll tell you, they can't just create this information. It has to be created from the people completing the survey. And the more people who complete the survey, the better the data are. So we don't want to be making decisions on a really small sampling of beekeepers. in the United States. We really want as many beekeepers as

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possible, with one colony up to thousands and thousands and thousands of colonies to go and complete the survey because those data are invaluable. And I know we've got a lot of listeners from all around the world, but the data are important to them as well, because what I find is that what beekeepers here in the US tend to notice their major issues tend to be universally true. And so it's really useful to all beekeepers everywhere, but we need beekeepers to complete the survey. That's where it starts.

Amy 32:45
Yeah, absolutely. I mean, my entire job is based on the needs of beekeepers. I can receive an email here or there, but at the same time, this is the way that will help the entire industry as a whole. I just want to echo what you said, it is very important that beekeepers do fill out this survey because this is where your voice probably is heard even more as a collective. And so I think that's extremely important. All right, so this episode is coming out April 5, and so you have three weeks or so. So I think they said it was the last day of April that the survey is closing. So be sure to check out our additional resources or additional notes, either on our social media pages or on our website.

Stump The Chump 33:35
It's everybody's favorite game show, Stump The Chump.

Amy 33:44
Welcome back to the question and answer time. Jamie, I had a friend who is a beekeeper in Missouri, and she was telling me that she had learned that there is no such thing as being honey-bound or nectar-bound. And so I was thinking about that the other day after someone had emailed us asking if bees could be pollen-bound. So is that a thing just to be pollen-bound? And what would be some issues if it is a thing?

Jamie 34:12
So, Amy, let's talk about this a little. I'm going to start by explaining nectar-bound so that I can kind of get folks to understand this whole idea maybe behind being pollen-bound. So nectar-bound is when bees will fill the brood area full of nectar and it can limit a queen's ability to lay eggs. So that's the shortest definition possible with me kind of explaining it. So to take it a step further, I tend to see this happen when there's limited space on the hive. In other words, it's not supered appropriately, there's no other space to put the nectar, number one. Number two, you get a strong nectar flow, but very little incoming pollen. So it takes pollen to make bees, and if you've got very little incoming pollen, then there's not a lot of brood being reared. So there's now space in the brood nest to put this nectar that's coming in. And it's discouraging because the bees are putting nectar where you don't want it, maybe you want the honey in the upper super so that you could extract it. It's much harder to get it out of the brood chamber if there happens to be brood there. So it's a bit of a discouraging thing, get nectar-bound and influence the queen's ability to lay eggs. I used to see this when I lived up in Georgia. My bees would get really strong and make a lot of honey during the spring nectar flow when there's a lot of pollen available. But if I wanted to collect sourwood nectar, which blooms kind of mid-June to July, you have to move your bees up to the mountains. Well, sourwood was a very strong nectar flow, but very limited amount of pollen coming in, at least in that particular context for me. So my colonies would very quickly get nectar-bound in the brood chamber, which was very frustrating. I wanted that sourwood

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honey placed up in my supers, etc. So I tend to see this happen, again, heavy nectar flows with very limited pollen availability, which limits the bees ability to produce brood, which creates all that space in the brood chamber for them to put honey. And couple that with poor supering, and you just get honey stored where you don't want it. So then the question is, can honey bees be pollen-bound? So then you have to wonder, what situations would create that? So in all of my time keeping bees over three decades, I have never witnessed what I would consider a pollen-bound situation. So that would be, potentially, when a lot of pollen is coming in, but bees otherwise don't have the desire to produce brood because, usually, it's incoming pollen that triggers brood production. So what bees would simply do in response to a lot of pollen coming in, is just rear more offspring. Whereas they wouldn't necessarily do the same thing if a lot of nectar was coming in. That's not automatically a brood-rearing trigger, whereas pollen is. And so you'd have to have a tremendous amount of pollen coming in at a time of the year that the bees were otherwise receiving triggers that are telling them not to produce brood. And that would be maybe going into winter, things like that. And so I have seen colonies have two or three or four frames absolutely full of stored pollen, but I've never seen it go from wall-to-wall stored pollen, and it create a pollen-bound situation, the same that we would mean if we say nectar-bound. So I would not say, Amy, that it's impossible, I would just say, if it happens, it's far less likely than colonies being nectar-bound.

Amy 37:32
Right. So it kind of makes me wonder, you're saying that the pollen kind of helps trigger that brood production. So if beekeepers are feeding pollen substitutes during the off-season, what are your thoughts on that?

Jamie 37:46
So Amy, they're often doing that for the very purpose of getting the bees to produce brood at a time of year the bees wouldn't otherwise do that. And they're trying to kind of circumvent Mother Nature's lack of pollen and say, "Hey, we still want you guys to grow. And maybe we want to even split you. Who knows? And so we're going to give you pollen to encourage that in the colonies." And that's exactly what they're trying to do in that instance.

Amy 38:10
Right. All right, so the second question that we have, so we are in February, March of 2023. And in 2022, there was a hurricane, which happens pretty often here in Florida. So we had Hurricane Ian happen and a huge part of what took colonies, just destroyed colonies was the fact that there was a lot of flooding. And a lot of the bees were gone, the equipment was all damaged, and these colonies drowned. And so the questioner was basically saying that their equipment had decayed, it really was dark stained, it smelled a little bad, and this was a couple of weeks after the flooding. And so the question basically is, should a beekeeper attempt to reuse any equipment especially after drowning or it's been sitting in water?

Jamie 39:04
So, Amy, I would. I would not do it if it were rotten, like if it's falling apart, which of course water can do, right? Water causes wood rot. But if the water receded within a day or two, that wouldn't be an extraordinary rot risk if the wood was dried relatively quickly and then stored appropriately, right? So I

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would be comfortable reusing the woodenware. I mean, the way the hurricane happened here in Florida, it was kind of a mid-fall and the impact was mid to late fall kind of further on in there. So most of those beekeepers wouldn't have been putting bees directly back into that equipment but probably putting them in storage instead. So in those kinds of circumstances, if a colony drowns because the entire hive is submerged underwater, you would simply get out the bees, remove all of that dead rotting biological material and then you would dry out the woodenware to the absolute best of your ability, and then you would store it appropriately. I would say that you could use it next spring to put bees into. Now, storing is important. It needs to be in a nice dry area. And before I would use it again, I'd probably let it air out in the sunshine a day or two, I think, because the questioner was also asking about a smell, but that smell will go down over time, and certainly a couple of days in full sunshine in the Florida late winter, early spring, we'll probably cure that. Of course, you have to watch out for termites. Termites really like wet wood. It's close to the ground. So you're going to want to make sure and store that wood in an area it doesn't continue to get wet, in an area that it's not vulnerable to termites. And you can usually do that if you're storing it on a cement slab. Or if the woodenware is elevated, maybe on cement blocks or something like that, that termites won't ordinarily traverse. And so that's the way that I would approach storing that equipment as well as using it later.

Amy 39:15
Sweet. Yeah, you answered all my questions. I was gonna ask you about termites, I was going to ask you about fungus. But it sounds like you just have to air dry it.

Jamie 40:54
Yeah, you got to store it dry. Dry, dry, dry, dry, dry. And then, if it's super soaked, and it takes weeks and weeks and weeks, then it could prematurely rot. But you would be able to notice that. Of course, I wouldn't advocate using that type of equipment.

Amy 41:08
Sounds good. Okay. The third question, it's really funny. You know, what, Jamie? My background is in soil science. And I don't know the answer to this. I've never even thought about asking this question, actually. So I'm going to ask you instead.

Jamie 41:24
Okay, well, let's see how bad I can do with it.

Amy 41:29
So, a listener was asking and a listener was saying that a good topic to cover would be the quality of soil and whether that affects nutritional needs of honey bees or not. And now that I'm reading it out loud, I feel like I know how I would respond to it. But I'm interested to know what your thoughts are.

Jamie 41:47
I have absolutely no doubt that soil impacts the quality of forage available to bees. I have no, no, no doubt about that. And now, first of all, it's not my expertise. Amy, you can correct me if I'm wrong after I'm done with this question as this is your expertise, but I'll make a plea towards the end. So number one, you can take the same species and strain of plant and grow it in two different places and get very

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different nectar, pollen, bloom phonology and all of this stuff quality, right? Now, you could argue that some of that's related to climate, maybe they get more or less sunshine, more or less rain depending on where they are. But a lot of it's also related to soil. I can think, very specifically, when I lived in Georgia, sourwood is such a desirable tree to move bees to in summer to make sourwood honey. But sourwood also can grow in central Georgia. And in North Georgia, you just produce sourwood honey. In central Georgia, you don't. A lot of it probably has to do not only with climate, but also soil quality, soil type, we see that with a lot of other things that are grown, maybe the same string on two different soils can produce different amounts of nectar, etc. I would argue, Amy, that we know very little about this topic. But I have no doubt, at some point, soil health will very soon be a consideration for pollen health. I mean, you see this all the time, and folks are talking about regenerative farming and all of these other agricultural practices. It starts with the dirt. It starts with organic matter in the dirt, it starts with living organisms in the dirt, the microbes that process all of this stuff, it starts with the quality of soil and the type of soil. It really does. And dirt makes all the difference in the health and phonology of the plants, which makes all the difference in resource availability and quality to the pollinators that use the resources provided by these plants. And so while it may not be a thing that beekeepers talk about a lot, while it may not be a thing we see a lot, discussed a lot at meetings, I have no doubt that folks are going to really begin looking at this. And I know a few who are. So my plea is that this is certainly something that folks will incorporate into their research ideas and their research thoughts when we think about holistically improving pollinator health.

Amy 44:11
I 100% agree with you on that. And you're gonna make fun of me, but I'm going to tell you anyway, when I was an undergraduate student, I had a soils classification poster in my bedroom. Basically, we would go to soil pits and dig holes and look at the different layers of soil in the ground. That was in Kansas. And so when I moved to Virginia, and then I moved to Florida, that all changes because the soil changes. I mean, there's so many different aspects of soil that people don't think about, soil fertility and the soil structures and again, the classifications and the different types of soils but that is my soils nerd coming out in this podcast. But yeah, I think you're absolutely right that the quality of soil, the tie soil, the nutrients of that soil is going to affect the plants that provide the nutritional needs of honey bees.

Jamie 45:07
Well, Amy, I just think that's such a good comment. Humans, we are notoriously bad for trying to fix a problem one way, right? So let me give an example. Honey bees need more nutrition, so let's just go plant wildflowers for them. Well, it's not that simple. Holistic -- we live in a very complex world, and we're all affected by more than just the thing we eat or exercising twice a week, there's so much that goes into life. And so understanding pollinator health has to move beyond the diseases and pests that they get and managing queens or managing how much sugar water or honey they have with a colony. It's a holistic view on improvement of the environment in general to support what needs to be supported and healthy, not just pollinator communities, but healthy animal communities, plant communities, and all the above and more. So I think it's going to be one of those things that generations of scientists increasingly start looking at it using complex experimental designs, huge datasets to understand how to do things, like, how can we improve the soil to a way that truly benefits pollinators? I really think that

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there's a day coming where we kind of broaden our perspective when we consider solving problems that are never solved by just one little bandaid on one little issue.

Amy 46:31
I completely agree. Thank you so much for your questions. If you have any other questions, again, feel free to send us an email or reach out to us on our social media pages on Facebook, Instagram, or Twitter @UFHoneyBeeLab.

Serra Sowers 46:47
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.

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