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SPEAKERS

Jamie, Guest, Amy, Stump The Chump

Jamie 00:10

Welcome to Two Bees in a Podcast brought to you by the Honey Bee Research Extension Laboratory at the University of Florida's Institute of Food and Agricultural Sciences. It is our goal to advance the understanding of honey bees and beekeeping, grow the beekeeping community and improve the health of honey bees everywhere. In this podcast, you'll hear research updates, beekeeping management practices discussed and advice on beekeeping from our resident experts, beekeepers, scientists and other program guests. Join us for today's program. And thank you for listening to Two Bees in a Podcast. Hello, everyone, and welcome to another episode of Two Bees in a Podcast. In today's podcast, we'll be interviewing Miss Emily Noordyke, who's an Instructional Designer at the University of Florida Honey Bee Research Extension Laboratory as well as a mobile tech team member with the Bee Informed Partnership. She'll be joining us to discuss pollen substitute patty use in honey bee colonies. In our Five Minute Management segment, we'll be discussing how to collect propolis, and we'll finish today's podcast with our question and answer segment. Hello, everyone, welcome to another segment of Two Bees in a Podcast. Amy, we get lots and lots and lots of questions and comments from beekeepers about honey bee nutrition, right? I mean, do you get a lot of questions about that?

Amy 02:04

I get so many questions about it. And there's one person that I forward all of those questions to. And it's not you.

Jamie 02:11

I bet I know who that person is. I bet they're a guest today but hold still before I introduce that individual. So it's funny, beekeepers always seem to know how to administer sugar syrup or whatever carbohydrate source that they're giving to their colonies. But there's a lot of questions surrounding the use of pollen substitutes, how to address pollen deficiencies or low quality pollen in our colonies. And so fortunately, we have an individual who I consider an expert on this topic. It's Miss Emily Noordyke who's joining us. She is an expert. And we had the great pleasure of not only having had her in our laboratory as a master student, but she's continuing to work for us to do some instructional design work for us in some of our educational courses. She joins us today as a member of both our lab and also as a mobile tech team member for the Bee Informed Partnership. Emily, you're the experts on all thing pollen subs. So thank you so much for joining us on this episode.

Guest 03:12

Yeah, thank you so much for having me.

Jamie 03:16

So I know that was a long background, Emily. I feel like I was stumbling over your introduction. But to make a long story short, you came here, did your master's here in our laboratory, and you focused very heavily on pollen sub research. And a lot of it was rooted in this idea that we don't know a lot or as much as maybe we think we do about how bees use it. So we're really going to talk about some of the research projects that you did while here, specifically one about the movement of pollen subs to honey bee colonies. But before we get there, our listeners are from from all over Florida, all over the US, all over the world, so they might want to get to know you a little bit. So could you tell us about yourself, how you originally got started in bee research and what led you to do the work that you ultimately did that we'll be discussing on this episode?

Guest 04:04

Yeah, absolutely. So originally, I got into beekeeping because there was a beekeeping club when I was an undergrad student at Grand Valley State University in Michigan. And it just sounded really cool. I don't have any other good reasons than that. And I joined the club and I was just completely hooked on bees, so much so that I was originally an art student but I changed my degree halfway through to study biology.

Jamie 04:36

That's a radical change, Emily, that's a radical change. It's one thing to go from biology into entomology but to go from art to entomology, pretty radical.

Guest 04:47

Yeah, yeah, it was. It was a big change. But I think the bees were so interesting and also just kind of getting into some undergraduate research really helped. So I worked with Anne Marie Fauvel, who is now part of the Bee Informed Partnership, but she was a really great beekeeping mentor and research mentor for me in undergrad. She helped me get a couple of grants to do some honey bee nutrition work and that just started my journey with honey bee nutrition in general. So I was really hooked on bees after that. And I continued to work as a technician in some other labs after undergrad, just continuing my work with bees. And then after that, I was convinced I wanted to get my master's in entomology, like, this is the thing I wanted to do. So that led me to the University of Florida.

Amy 05:40

And we're so happy to have you at the University of Florida. I was so sad when you graduated. But I'm actually still glad that you're around so that I can, again, forward all the nutrition questions over to you, Emily.

Guest 05:53

Yeah, you just can't get rid of me.

Jamie 05:54

I feel bad for you though. Emily. Someday, like when you move on, Amy, are you still going to forward questions to her?

Amy 06:01

Probably. I'll probably cry a little bit and then still send questions over to Emily.

Guest 06:07

Well, don't cry, but that's okay.

Amy 06:10

So you're part of the big mobile tech transfer team. And I probably said that wrong. But something that comes out within their survey is that their top stressors for honey bees are Varroa, nutrition, and queen incidences. So you focus on nutrition. And I think a lot of the beekeepers know that they feed their bees sugar water, some of them feed their bees pollen substitutes. So can you tell us just a little bit about how beekeepers use pollen substitutes, specifically, and then, what does the literature say about their use? I'm sure you spent a lot of time conducting literature reviews during your time here.

Guest 06:48

Yeah. So beekeepers use pollen substitutes, mainly to strengthen their colonies in different seasons. So in spring, they want to bulk up their colonies, get them growing for the rest of the season. They also feed pollen substitutes to address pollen deficiencies in the environment, so when there's severe pollen dearth, and the bees just aren't getting the nutrients they need from the environment. And then they also might feed in late fall or winter to bulk them up for pollination contracts. So, famously, almonds in February. So there are all kinds of different timings and usages for pollen substitutes. And even though pollen substitutes are used pretty heavily by beekeepers, it turns out that there's a pretty big mix in the literature to how these actually work. The results are kind of all over the place. So it's pretty interesting to break that down and try to figure it out.

Jamie 07:57

Yeah, Emily, I remember when you were physically here in the lab, and you were putting together a review on pollen sub. So just FYI, all of you listening out there, she's written a massive review, looking across all the literature, all the research projects ever published on the use of pollen subs, whatever has been measured, and hopefully, that review will be published soon, hopefully, maybe even by the time this podcast comes out. But nevertheless, when you were going through the literature, what struck me is how truly mixed it was. You are spot on. Sometimes there was a benefit, clear benefit, sometimes there was no benefit at all. And sometimes maybe it was a neutral, bees took it, it disappeared from the hive, but it was neutral. And so when you were here, you decided that you were going to do some work on this topic. And so you structured a series of projects to try to address this. And the first of those projects is already published. And that's where you were looking at just the first question first, when a pollen sub disappears in a hive, where does it go? Right? We called it the Tracer Project. Could you tell us a little bit about the background of the study, how you set it up and what your motivation for it was?

Guest 09:12

Yeah, so basically, we just wanted to know when pollen substitutes disappear in the hives, at least the patty form, in the patty form, where do they actually go? We don't really know or we didn't really know.

Once they disappear, for all we know, they could just be ejecting it from the colony like debris so we wanted to trace them. We figured out that blue food coloring was a pretty good way to trace them. We dyed the patties and then we traced them around in different parts of the colonies. So we looked in the adult bee guts. We also looked into bee bread stores as well as in the larvae. And then we also had trays underneath the colonies fitted with screen bottom boards to collect any debris to see if they were actually, maybe, shredding these patties up and ejecting them.

Amy 10:07

That's super cool. I always remember just seeing pictures of some of your projects. Just real quick, do you feel like you're defending your thesis again right now?

Guest 10:19

Maybe a little bit. No. Definitely less pressure, which is great. I'm glad that's done and over with.

Jamie 10:28

We already know the outcome, Emily. Now we just have to share it with the world.

Guest 10:32

Yeah. You're not testing me.

Amy 10:36

Okay, so, Emily, from the research that you did, did you look at how bees interact differently between pollen substitutes versus natural pollen? Did you look at that? And then I know that you also mentioned that you had looked at where they were maybe putting the pollen substitute. So they're putting it in, you looked at bee bread, but was that different? What did that look like? Who do they feed it to? Where is this going, actually, is what I'm asking you. So what did you find?

Guest 11:06

Yeah. So we did find that the bees interacted a little differently with pollen substitute patties than natural pollen. And so yeah, it's important to note that we only looked at patties, we didn't look at any dry powder feed. So that could be a little different. But putting that aside, with the patties, we did find that they were a little bit different. We did, at least, note that adult bees ingest, at least a proportion of the adult bees in the colonies ingest pollen substitute patties because we found dye in their gut. So it's good, they're eating them. But when it comes to storing them, it's a little different. It doesn't seem like they store pollen substitute patties like they do bee bread. So that brings up the question, like, are these patties really useful for long-term storage or long-term feeding for beekeepers? This maybe suggests, no, it's not the case. But then we also looked in the larvae. And we found that they don't feed the patty directly to larvae. So we weren't finding dye in the larval gut. But the word directly is important here, because that's what we were measuring. So we were looking to see if the nurse bees were giving chunks of patty directly to the late-stage larvae, which they would do with natural pollen. But we didn't look at indirect feeding. So we weren't looking for how that patty may have gone through the nurse bee glands and made it into the brood food. It didn't seem like our dye was able to actually go through the nurse bee that way and end up in the brood food. So that's still maybe for a future study. But yeah, as far as we know, they don't feed it directly to larvae.

Amy 13:02

That's so interesting, but you said that they feed natural pollen directly.

Guest 13:09

Yeah, a very small percentage of the larval diet comes directly from just pure bee bread. But it's mostly jelly that they get.

Jamie 13:21

So Emily, I want to follow up on some of these comments because I think it's really interesting. So we'll just kind of go one by one. And so I think the larva, when you really discuss, well, this idea that yeah, the diet's disappearing, even though they would ordinarily mix a little bit of pollen in with the brood food, we didn't see evidence that they were mixing patty in with the brood food. Now, just like what you said, that doesn't mean they're not using it for larval nutrition, maybe it's helping the nurse bees' mandibular glands develop or whatever to help them produce the food necessary for larvae. But I want to backtrack, specifically to the adults and then maybe the bee bread. First, the adults. So you found, you said, the dyed diet in a percentage of the adult bees. Do you have a guess about why it might be there just because they take it in? Are they using it? Is this strong evidence that they're using it for something? I mean, what are your feelings surrounding that?

Guest 14:18

Yeah, well, the fact that they're ingesting it means something, right? But for all we know they could be ingesting the patties because they're full of sugar. It might not necessarily be because they're looking for it as a protein or fat source, which is what the patties are meant to do, like replacing the pollen. So there's still a lot of questions surrounding what the adult bees actually get out of the pollen substitute patties.

Jamie 14:55

I think that's completely right. I mean, they take it up, but the patties have a lot of sugar in them so that doesn't necessarily mean they're using it for the purpose we think. Now, they very well could be, just like what you said. I think there's a great need for research on this topic. So let's just look, specifically, then, maybe at bee bread. Why do you think there's no evidence, from at least your study, that they were storing the bee bread? I mean, what do you think that means, if anything?

Guest 15:22

So the bee bread is interesting because with the patties, it doesn't seem like they store it. However, there is some anecdotal evidence. I'm saying anecdotal because it hasn't been tested, but there's maybe some evidence that the bees do store dry pollen substitute when it's in feeders externally from the hives. So we're kind of wondering if they don't store the patty, and they do store the dry subs because of a difference in form. So because the foragers go out, they're hardwired to gather pollen from flowers, bring it back to the hive and store it in the comb, then why would they bother to do that? Why would they pack pollen sub that's above the brood nest already in the hive onto their hind legs and deposit it right there, or just like not behaviorally hardwired to do that is what we're guessing. However, maybe with the dry sub in a different form, they're able to pack it on their hind legs and bring it back. Again, the dry sub thing hasn't been tested. But I think it's interesting to think about how bees' pollen

substitutes are being offered and how bees might actually be using them. You know, it's funny, Jamie, I didn't realize how similar you were to a honey bee. I'm thinking about you and your caramel M&Ms.

Jamie 16:48

Yeah, those things are amazing. That's not an endorsement by the way. They are really good.

Amy 16:58

They're like, "This is just full of sugar, but that's okay, because I'm still going to eat it."

Jamie 17:04

Emily, just FYI, I introduced Amy and Cameron to the wonderful world of caramel M&Ms yesterday.

Amy 17:15

Now, we're just going to pack ourselves full of sugar.

Jamie 17:17

That's right. Apparently, it'll be used against me forever.

Amy 17:23

All right, Emily, you talked about the difference between the pollen patties and some of the dry pollen substitutes that are out there and how we still need a lot of research on this topic. So where do you see our potential projects for the future? I mean, what are some outstanding areas of research on this topic of pollen substitutes?

Guest 17:46

So yeah, there are definitely a lot of areas of research that we need to cover with the pollen substitutes and a lot to learn. From the tracing study, we really could learn more about whether the nurses are actually feeding the patties indirectly. If they make it into the brood food to the larvae, that would be a really interesting thing to know. We also don't know what age cohort of bees are actually using these diet. So are the nurses mainly using the diet? Are the older forager using the diet potentially just for sugar? Or are they just kind of distributed over the colonies throughout all different age groups? We don't know that either. And that could give us some insight as to why they're actually using these pollen substitutes. And kind of more broadly, it would help to know when and where, in what circumstances pollen substitutes are useful because the literature seems to suggest that they're useful in very specific conditions. So if the bees are really, really pollen stressed and maybe in specific seasons, so like, if they are kind of stuck in the colony in a cold, rainy spring for a long time, then they tend to do well with pollen substitutes. So okay, that's great. That seems obvious, but there are so many other environmental conditions and other conditions that we haven't explored with pollen substitute efficacy, and I think looking more deeply at that could be really helpful for beekeepers.

Jamie 19:43

So Emily, this is great. You did a lot of great research. The publication is out, we'll make sure to link to it in the show notes. So kind of the ultimate question for all of our listeners out there, all these individuals who are beekeepers, so what does all this mean for beekeepers? What is their take-home message

when they're trying to decide whether or not to use a pollen patty when they're trying to determine if they're worth putting it on their colonies or not?

Guest 20:06

That is definitely the ultimate question here. I definitely think more research needs to be done to truly get at this. But my recommendation for now is that if your bees are really stressed, if they're really desperate for pollen nutrition, then pollen substitutes could be a good, maybe a good fix. Unfortunately, there is not a pollen substitute that exists that can entirely replace natural pollen. We just don't know enough, currently, about the honey bee diet to have a pollen substitute formulation that does the job fully. So that's kind of the unfortunate truth. But knowing that it's a little bit of a bandaid fix if your bees are desperate, then yeah, I'd say it's probably a good idea to try. But the research seems to suggest that if there's a little bit of a pollen flow, then pollen substitute might not be as impactful or effective in benefiting the colonies. So it's just important to keep those limitations in mind, especially when you're spending a lot of money on these diets.

Jamie 21:31

Emily, I think that's fantastic advice. It is a really tricky area, right? Just like what you say, you've got these situations where it seems to work, and you've got these situations where it maybe doesn't, but you couple that with the fact that there's just really widespread use of pollen subs in the industry. It's tricky to know what recommendations results from this because if you're out there listening to us now and you believe that you're getting benefits from pollen subs, and you've got clear documented efficacy, then by all means continuing using them as your management suggests. But Emily, I think what your research has shown is that it's just it's just really not as clear cut as a lot of people think. So I really appreciate you joining us and spending some time talking about your research and some of the things that you've discovered with the use of pollen patties.

Guest 22:20

Absolutely, I was glad to be here to talk about it.

Jamie 22:24

Everyone, that's Miss Emily Noordyke who's been both a master's student who's graduated here from our laboratory but now is an instructional designer here at the Honey Bee Research and Extension Laboratory at the University of Florida, as well as a mobile tech team member for the Bee Informed Partnership. Thank you for joining us on this segment of Two Bees in a Podcast.

22:43

For more information about this podcast check out our website at UFhoneybee.com.

Amy 23:24

Okay, this is our Five Minute Management. This is actually the last Five Minute Management that we will be putting out for 2021. So, I feel like there should be an audience clapping right now, but I'll just go ahead and pretend that I hear it in my mind. It's happening. Alright, and so our last segment, we are going to be talking about how to collect propolis. I'm hoping that in 2022 we'll actually have some sort of propolis expert come and talk to us about propolis. But for now, Jamie, how do we collect propolis? You've got five minutes.

Jamie 24:00

Well, people think about making money with bees, they think about making money with honey, they think about making money by pollinating crops, they think about selling nucs or packages, but there's lots of other ways you can make money. Amy, kind of as we wind this up, we've talked about collecting pollen, we've talked about collecting beeswax and other things. Well, now, we're focusing on propolis. Propolis is not necessarily one of those things. It's used a lot in the US, but it's used a lot in a lot of other countries around the world. Right? It can be used as a wood finish, a varnish, it has been used medicinally as a dietary supplement, I know a lot of people chew propolis for what they claim is dental hygiene, it's been used in cosmetic products. So there are lots of reasons that people might want to actually collect propolis from their hives. So how do you do it? Well, it all boils down to remembering where bees put propolis in the first place. Bees will often close gaps in hives using propolis. They'll glue the boxes together, they'll glue the bottom board to the bottommost box, they'll glue the lids to the hive, bees are putting propolis in cracks. So one of the best ways to harvest propolis is to introduce a crack that bees would want to propolize in the first place. There are actually devices called propolis traps. Propolis traps look a lot like plastic queen excluders, except the gaps between the plastic runners are far too close for bees to be able to go between. So it basically looks like a queen excluder that no bees at all can pass. And what you would do is take off the lid of your hive and put on this propolis trap, and some folks will leave the lid of the hive off, I don't advocate doing that because of course, it can rain into the hive that way until the bees actually fill that trap with propolis. Or you can return the lid to that hive, which is what I would recommend. So they usually put it between the uppermost box and the lid of the hive. And because you've got this texture, this irregular kind of spaces in this propolis trap, the bees will collect propolis and fill that propolis trap. Once it's full, then you would remove the trap and either scrape it with a hive tool, I know a lot of folks who will do the second option, which is throw it in a freezer. And then once it's frozen, you could take that propolis trap out and kind of twist it almost like you would an ice tray and it pops that propolis free from the trap and you get all these little propolis nuggets as it were. You will also want to go through that and make sure there's no unwanted debris, dead bees, body parts, other things that you don't want showing up in the propolis. That's kind of it, Amy. You collect it from the propolis trap, you put it in a container, and then you use it however you want to use it or sell it to folks who are interested in collecting propolis. I know that there are some folks who will cut holes in the sidewalls of their hives. And bees will gum up those holes with propolis. But if you're going to do this, I would recommend that you use these standard propolis traps that you can buy from any of these equipment suppliers out there. But that's it. It's pretty simple. You put the trap on, you scrape or freeze the trap and pop that propolis off, you put it in a container and that's it. You do with it what you want to do with it at that point.

Amy 27:41

That's so funny. I actually had no idea that there were propolis traps. I guess I could have assumed that that was a thing, but I've never thought about that.

Jamie 27:51

But, Amy, when you see one, it's going to look a lot like a plastic queen excluder with the gaps way too small for bees to navigate. It's a really simple concept. You're just producing this textured surface in the hive that the bees want to stick propolis in for whatever reason they want to do it, but it seems to work.

Amy 28:07

Alright, well sounds good. Well, there you have it, everybody. That's how you collect propolis. Don't forget to tune in next year to our third year, yeah, we're going into our third year of podcasts. Jamie, that's crazy. I'm very excited. So if y'all have any questions, if you have suggestions on management sections that you would like to hear, please feel free to reach out to us through social media or through email.

Stump The Chump 28:40

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

Amy 29:03

Welcome back to our question and answer segment. Jamie, the first question we have, so this person's wondering how to detect and identify good local resources for pollen and nectar. Where do we look? And then how do we know what the primary nectar flows are in our area?

Jamie 29:19

Yeah, these are good questions. I give a standard answer to this question every time I get it. The standard answer is, there's no better resource for local nectar and pollen sources that honey bees prefer than experienced beekeepers. Beekeepers who keep bees in your area will know what the main nectar and pollen plants are for the honey bees in that area. So the first thing I would do would be to try to find a local beekeeper who's been keeping bees in the area for any length of time. I might add to that, you're going to have a much higher chance of finding local beekeepers if you are involved in your local bee club. So if I were looking, if I wanted to know what the major nectar and pollen plants were for honey bees when they bloom, wherever I move, I would seek out local beekeepers with that knowledge. And I will tell you, commercial beekeepers are particularly intriguing in this regard, because they have to make a living on honey production, right? And so they're going to really know what the floral sources are and probably even where those floral resources are more abundant in the area you live. For example, if they say plant X is the best plant in our area, that doesn't mean you have plant X anywhere around you. It could be 5, 6, 7 kilometers away. So speaking with a local beekeeper will say, "Hey, plants X, Y and Z are great. And there's a high density of X close to the river on this part of the county and a high density of Y over here on the flats in that part of the county." And that's absolutely what I would do. Local beekeepers, local beekeepers, local beekeepers.

Amy 31:03

Yeah, absolutely. I would agree with that. Here in Florida, we've got a beekeeping management calendar that we put out every month. And I would encourage other states to, if you have not done this already, to go ahead and adopt that and make your own resources for your local beekeepers. And it could be on a state level or on a district or county level. I think that that would be really fun for beekeepers to be able to work together on that and provide that for other beekeepers in the area. All right, so the second question we have, so this person's wondering, what are some strategies for finding potential apiary sites? And how do we as beekeepers work with property owners when we want to put bees on their property?

Jamie 31:44

Yeah, Amy, these are also great questions. And we made sure and put this question in here because it's almost related to the first one, right? First it was, what are good nectar and pollen plants for bees? Here, it's, well, how can I find these apiary sites? Maybe I don't own them. Well, if you're a beekeeper, a lot of the places you might want to put your bees, you're unlikely to own, right? So let's just kind of start at the beginning. Here in Florida, and in many parts of the US for that matter, but here in Florida specifically, I'll use our Florida situation as a prime example, we have county agents who work in every county in the state of Florida. These individuals are co-employed by the county and the University of Florida and these individuals are experts on floral resources in their counties. But they also know who the landowners are, especially the big landowners, right? They're going to know who the growers are, who the cattlemen and women are, they're going to know the water management districts and the wildlife management districts. They're going to be a great individual who can help match you, a beekeeper who has bees and wants to move them to certain areas, to the folks who either manage or own the certain areas. So if you live in the US and have access to county agents, that would be the first place I'd check. If you live outside of the US or you don't have direct access to county agents, then take the next step. Who are the big landowners in counties or in areas? Well, they're usually people who manage forests, people who are cattle producers, or people who are fruit and vegetable and nut and berry producers. And then there's even groups of individuals who might work for county or city governments who manage property for water management districts or local parks or state parks or things like that. So I would find those individuals. A lot of counties or a lot of regions will have county fruit and vegetable growers associations or cattlemen associations. These are great associations to network with because these individuals usually manage lots of land and might be able to provide opportunities for you to site your bees. So a lot of it's just networking, farmers associations, cattlemen and cattlemen associations, water management districts, all these are great places to reach out to, to say, "Hey, I've got bees. You've got a lot of stuff on your property that my honey bees can benefit from. Is there a way that I can maybe keep bees with you on your property?" But again, at least in the US, specifically here in Florida, again, as a prime example, county agents are a great first resource for you, because they know those people, and they can make the introductions for you. So these are the ways that I would recommend looking for folks. And then once you find them, making that sales pitch, "Hey, you've got a lot of good resources available on your property that could really benefit my bees. Can we talk about me putting bees there?"

Amy 34:53

Sure. Absolutely. I do see a lot of people on Facebook who say, well, they'll join a beekeepers page and they say, "We have property and we'd love to have bees on here." And so that's also another great networking opportunity that we have. And so I know that we had JK Yarborough, he did a segment with us talking about how to build that relationship with landowners. Maybe providing a jar of honey would be good.

Jamie 35:19

Amy, what you said too is so perfect. It's a brilliant comment, this idea about social media. You can tell how old I am. I'm sitting here, "Oh, you just talk to this person and that one." But you're like, "Hey, you just blast out to your friends, hey, I'm looking for some land to put some bees." Of course, you could do it the social media way too. It probably would work as well as some of the things I discussed. Thanks, Amy.

Amy 35:43

I actually had a call yesterday, and this individual was asking about one of the programs that we had, and he was like, he was from out of state, and he said, "How do I implement this program?" And I said, "Oh, it was a collaboration between our Department of Ag, Florida Farm Bureau, ourselves, UF and other departments." And he said, "So you're telling me I have to work with other people?" And I said, "Yep." And he said, "Well, that's going to be the hardest part to do." So, again, if you all need help with that collaboration aspect, we are here to help to try to act as a liaison between different entities. So please take note of that, and use us if you need that help. Okay, so that third question that we have today, there is a white substance being noticed on honey bee pollen baskets, what would this be?

Jamie 36:33

Okie dokie. I'm going to take the first swing at this question and say it could just be white pollen, right? Bees collect pollen from different species of plants. And so a lot of plants have very unique colored pollen. And there are plenty of plant species out there that just produced white pollen. So if you're seeing these big pollen balls on the basket that are white, it's a high probability it's just pollen. Now, bees can mistakingly collect other dusts as pollen thinking that it's pollen and so occasionally, you'll get whatever debris that they've been exposed to might be on their pollen. They end up getting exposed to something that's kind of white and they think it's pollen. But my first and only guess is that it's just probably a white pollen.

Amy 37:21

I think that's fair. We talk about how the honey bees have little hairs that kind of just attract different things. It could just, like you said, be a speck of dust.

Jamie 37:31

Yeah. If you think about all the things that bees visit, when they're out there visiting, even if they're not there to collect pollen, they're there to collect nectar, if the plant has some powdery dust, there's plants, for example, that get a mildew called powdery mildew. It's a pathogen that bothers plants, so bees can just get, they get exposed to this stuff, and it can just show up on their hind legs. So my guess is that you're just seeing bees collect pollen. White pollen.

Amy 37:58

There we go. All right. Well, that is our last question and answer segment of the year, and we look forward to answering more of your questions in 2022. Hi, everyone, thanks for listening today. We'd like to give an extra special thank you to our podcast coordinator, Chelsea Baca, and to our audio engineer, James Weaver. Without their hard work, Two Bees in a Podcast would not be possible.