Episode 122 November Management_mixdown PROOFED

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SPEAKERS

Stump The Chump, Jamie, Amy, Serra Sowers

Jamie 00:10
Welcome to Two Bees in a Podcast brought to you by the Honey Bee Research Extension Laboratory at the University of Florida's Institute of Food and Agricultural Sciences. It is our goal to advance the understanding of honey bees and beekeeping, grow the beekeeping community and improve the health of honey bees everywhere. In this podcast, you'll hear research updates, beekeeping management practices discussed and advice on beekeeping from our resident experts, beekeepers, scientists and other program guests. Join us for today's program. And thank you for listening to Two Bees in a Podcast.

Amy 00:46
Hello, everyone. Welcome to this segment of Two Bees in a Podcast. We are getting into November and I've been receiving a lot of emails about what people need to do to start preparing for winter. Here in Florida, it's probably still like 80 degrees Fahrenheit outside. So we really don't have a lot of winter but there are lots of other states and our listeners are going into this cold snap going into wintertime. Jamie, I just wanted to talk a little bit about how beekeepers can start preparing for the winter time. Let's start with our favorite, let's start with Varroa and Varroa destructor. I mean, the number one question I've been receiving is can I treat for Varroa? Can I put strips in my colonies? And if I do that, can I leave them in there throughout the entire winter?

Jamie 01:38
I always feel bad, Amy, every time our listeners have to hear us say the word Varroa. I bet they groan and go, "Not again."

Amy 01:45
They should turn it into a drinking game.

Jamie 01:47

Well, it's a game I wouldn't play, but I'm sure maybe someone does. Okay. Varroa. It's November and in the northern hemisphere, that means, I guess, per the sun's movement, you're somewhere around about a month, month and a half away from formal winter starting in late December. But let's face it, if you live in the upper part of the Northern Hemisphere, or whenever you're going into winter is for you in the southern hemisphere, that kind of last month before winter formally starts can be quite cold. Now, for us here in Florida, November's not usually a problem. We work bees a good chunk of the year. But if you're in the northern United States, if you're in Canada, if you're in Northern Europe, Northern Asia, as an example, or if you experience your winter in the southern hemisphere when you're much further south on your respective continents in southern South America, Southern Africa, and southern Australia as an example, all of these places can get very cold in the months leading up to winter. And by this time, you need to have had your Varroa under control. We've talked about this nearly every month in the monthly management. And what does that mean? That means you have to have been sampling colonies, you have to have been treating in response to your Varroa numbers, you all know, you've heard me talk about the fact that colonies produce winter bees in those mid-summer months, those late summer months, and early fall. Those are the bees that are going to carry those colonies through winter. You don't want those bees compromised in any way and a cheap way to compromise those bees is to allow Varroa to be in your colonies munching on those young ladies while they're developing. So Varroa control, Varroa control, Varroa control. In fact, November almost represents the month that it's almost too late to do anything about it for a good portion of the beekeepers who are listening to us here on this podcast, simply because by the time November rolls around, you need to have already had this under control. But in the event that you don't, this is your last opportunity. You really want to send bees into winter with as low Varroa populations as possible.

Amy 04:07
So what about the strips, Jamie? I know there are a lot of areas that do have mild winters. And so if they're wanting to add strips, how long can they leave strips in for? A lot of winters do go from what, like November until February, March, right? And so can they leave strips in for that long? And if not, why not?

Jamie 04:28
This is such an important discussion, Amy. I'm going to come out of the gate saying what I think most of our listeners would expect me to say at this point, which is fallow the label. The label on the products will tell you how many strips to use and how long they should stay in colonies. They should not stay in a colony a second longer than what's on the label. First of all, at least, well I think everywhere there are pesticide labels, it's against the law to violate the label. I don't know of anyone who's been arrested for violating the label but it's against the law to do that. Number two, the reason this is on the label in the first place is because the treatment window specified on the label is the window the compound actually kills Varroa. If you leave them in too long, then the levels of the compounds in those strips decrease to the point that Varroa are being exposed to them, but are not being killed by those levels, which is a great way to produce resistant Varroa. So leaving strips in longer than they are labeled to be lifted is bad, bad, bad, bad, bad. It is always disheartening to me when I work at a colony with a beekeeper and I see the strips that they put in a week ago but I see the strips, also, that were put in three months ago, and then I see the strips, also, that were put in six months ago. Trust me, I understand the logic behind it. We've got to kill Varroa. If there's any residue in there, I want to get everything I can out of those

strips. But that's actually counterproductive. So follow the label. Don't leave those strips in colonies over winter. If the label doesn't permit it, it will give you a treatment window and you should stick to it.

Amy 06:18
All right, so Varroa, Varroa, Varroa. We talk about it in every episode and until we have something different to tell you, we're going to keep talking about Varroa. But the second piece of what I wanted to talk about with the management is food. Jamie, this is one of those things where, at this point in time, have we harvested honey at this time? If we've harvested honey, do we need to feed? If we haven't harvested honey, do we need to feed? What are your thoughts on management for November and whether we need to feed or not?

Jamie 06:51
Yeah, so absolutely. This is the time of year that, by this point, you will have taken off any of those supers of honey that you wanted to keep as honey and sell as honey. Those supers should be long gone off the colonies by now. And at this point, colonies should contain what it is they need to survive winter, and that again, depending on whether you've got a warm winter, cold winter, etc. I'm going to overgeneralize and say that's roughly a medium super's worth of honey. So if you're talking about a deep box, two-thirds of a deep box of honey, if you're talking about shallow supers, because we have a second small super here in the US, I'm saying two shallow supers or a shallow super and a half of honey. But about one medium super's worth of honey or stored sugar, that can be sugar syrup, it can be corn syrup, whatever liquid sugar that you fed to them to get them to store. So you need about a medium super of that so that they can have enough food to power their energy, which includes their heating cost through winter. And so that's what you need. If you don't have that, you've got to feed. You're running out of time. So you definitely want to check the food reserves and make sure that they have everything that they need.

Amy 08:02
Yeah, so if the colonies are either declining or in trouble just through having too many Varroa and not enough food, if they're starving, at what point do we start thinking about do we split these colonies? I think the answer to that is no. But when we start talking about combining colonies, what does that look like? When do you make the decision to decide whether you want to combine colonies so that they're strong enough to overwinter?

Jamie 08:28
Amy, great question. Now is go time. If a colony is suffering this time of year, there's high Varroa loads or their food reserves have been so low for so long that the colony is dwindling, it is time to cull. And by cull, I mean you do not want to carry these colonies through winter. They're going to die throughout winter. You're going to have an empty box with resources that can be stolen by other bees, wax moths might move in, now it's time to cut your losses. So if I see unusually weak colonies this time of year, I will combine. I'll usually kill the queen from that colony, the weak colony, and then combine the bees and resources with another colony that might need those bees or resources or just even a strong colony. I do not try to carry weak colonies through winter. So now is absolutely like your final combining time. It's a good time to make that final cull before heading into the winter.

Amy 09:21

So let's say you did want to produce queens during this time of year. I mean, is it possible and is it practical to do?

Jamie 09:27
Nope and nope.

Amy 09:29
Okay, well that was an easy one.

Jamie 09:31
You don't want to produce queens this time of year. Now, there are a few exceptions. It's so weird, Amy, that we keep that we do our podcast from Florida and Florida is not very representative of the rest of our listening audience's world. But in southern Florida, conceivably you can produce queens maybe year-round. It all depends on your colonies' production of drones. You can get a queenless colony to make a queen cell as long as there's brood but those queens have no one with which to mate if there are no drones in the area. So what I would say to that is you really need to put out of your mind a desire to make splits, a desire to make queens, this is just not the time of year to do it. Yes, there are exceptions to this rule. And maybe you live in a tropical paradise where you can pull this off. But for the rest of the world that's not so close to the equator, this is not the time, winter, pre-winter is not the time of year to be doing this.

Amy 10:26
Alright, so I want to move over to equipment, and just, in general, the management with some of the equipment and getting hives ready for the cold. So I used to keep bees in Virginia, and there were beekeepers that would wrap their colonies. We've had episodes where we talked about ventilation and insulation. Those are like some of our top podcast episodes, I think. People loved those episodes. And how do we start thinking about getting ready for the cold, especially in cold climates?

Jamie 10:56
So this is a really interesting question. I mean, it's largely interesting to me due to those very comments that you made that all the podcast episodes we've done so far, I don't know what we're on. This is probably somewhere around 120 something probably. Of all the episodes that we've done, two of our most popular episodes have both dealt with thermoregulation and insulating colonies, not only in winter but also in summer. And I will argue, I will say to you that I'm certainly no expert on this topic, which is why we brought in those two individuals to talk about. And the reason I'm no expert is I've always lived in a warm climate where it's not a habit for beekeepers to wrap colonies and insulate colonies heavily because my colonies seem to go into winter strong and come out of winter strong. So it doesn't seem necessary for me to be able to do that. But I will tell you that those articles in those interviews and some subsequent articles that I've read have convinced me, especially living in northern states or colder states, depending on if you're in the northern hemisphere, southern hemisphere, that wrapping colonies, making sure that you have insulation over the top of colonies, doing away with upper ventilation, which is something we've talked contrary about for the last few decades, all of these things can really help colonies overwinter in cold climates. Again, no upper ventilation. You don't want to create that chimney effect insulating on top of them and beside them because that's what would be duplicated if the bees were nesting in a tree themselves. And this reduces their need to use energy,

right? If you don't have a well-insulated colony, they might burn through the honey reserves quicker to try to keep their colony warm. So if you live in a warm climate, this isn't something maybe that you would consider doing. But if you live in a colder climate wrapping colonies, dealing with ventilation, making sure that you have appropriate insulation, these things are very important to get those hives ready to be good places for those colonies to overwinter.

Amy 12:57
Right. So I want to go into two other questions that I've been receiving pretty often from beekeepers, and one of them is about queen excluders and what we should do with them during this time of year.

Jamie 13:09
I think we went into pretty good detail, if I'm not mistaken, about that back in October, the October monthly management. I'm just going to echo kind of what I said there, which is take your queen excluders off. And I even gave the example, I was not a believer in this for years and years and years. I was told to do this and didn't think about it. And the idea is that clusters often move up during the winter. And so if your cluster of bees is moving up slowly over winter, your queen can get trapped below the excluder and die from exposure. And I saw that in a few of my own colonies. And so from that point forward, I'll remove queen excluders. I make the point here, especially in November monthly management, is November is always the time that I do that. In fact, the fourth Thursday of every November in the United States is Thanksgiving holiday, and that's usually the weekend that I would go into my colonies and remove the queen excluders. I placed them under the lid of the colony so that I don't have to remember to bring them back in March when I put them back home and I'll remove those queen excluders so colonies can migrate up in the nest structure. So if you live in a colder climate, maybe that was something you did back in October. But for me, and probably for a lot of folks, I would recommend considering doing it here in the month of November.

Amy 14:20
Sounds good. Okay, so the second question that I've been receiving is when should people be taking supers off of what they have? I don't know. I've seen beekeepers stack like 5, 6, 7, supers high. And so when we go into winter, should we take supers off and when do we do that?

Jamie 14:41
Amy, I have two answers to that question. The first answer is assuming that those supers are full of marketable honey that you want. In that case, these things should have been off probably a couple of months ago. So absolutely, take those off. And again, that's assuming they have marketable honey, number one, and number two, assuming that you leave an adequate amount of food for that colony left behind in the amount of something, again, like I said earlier, in the neighborhood of about one medium super's worth of honey. Okay, that's the first answer. The second answer is if these supers are just empty comb, then you might consider leaving them overwinter just as a way to store those supers without having to take up freezer space or to put them in a shed. That's actually how I would store my honey production supers that have no honey and then they're just empty comb. I typically will put two or three extra pulled combs but no honey supers on my colonies overwinter just so I don't have to store them in the shed. So to work from the bottom of my hive upward, I'd have a deep brood box that has the queen and the bees and the brood and the honey and the pollen, etc. I'd have a medium super that's full of honey that provides them everything that they need throughout winter, and then I might put

two to three supers that are empty above that just as a way to store. So I don't usually take those off unless I saw a little bit of wax moth damage or the colony wasn't strong enough to keep those supers patrolled. So it all depends on if it's full of marketable honey, those supers need to be gone. But if you're considering using your colonies as a place to store empty supers, you might do that. But I will just give you one warning. If the cluster is generating a lot of heat, and you've got a lot of empty super space above their head, that heat is going to move up. And this might only work in areas where you don't have these extreme winters. So if that's you, if you have these extreme winters, I would condense the colonies down the hives, down to what they need to be, which is no more than about a single deep with a medium super or a double deep, which is slightly bigger than the single deep medium super just to condense them down, insulate them appropriately. And go from there.

Amy 16:56
Yeah, I was just thinking, if I was up north and I had that empty space, I would be worried that mice or other vermin would be coming in trying to make it their home.

Jamie 17:07
I'd definitely take it off if it was up in the colder climates. Absolutely.

Amy 17:11
So the last thing I wanted to talk about, this is kind of the time of year where we wind down a little bit. This is where most of our beekeeping and beekeepers' meetings are happening. More and more of the annual meetings that are happening, and so let's talk a little bit about some of those fall beekeeper meetings and what your thoughts are, Jamie, for people being involved with those meetings and maybe how they could benefit from them.

Jamie 17:32
I'm an absolute huge advocate of beekeepers being involved in bee clubs. That can be their local bee club, their nearest bee club that meets closest to them, it can be their state or provincial or regional bee club, it can be their national bee club, it can even be international bee clubs. But I will say in general, October to February of every winter, or late fall and winter, that's when the majority of bee clubs, local, state, provincial, national, international, that's when they tend to have a lot of their meetings because it's considered the off-season for bees. You've got those bees ready for winter, and they're just kind of hanging out during winter. So a lot of bee organizations will try to slam their bee club meetings in this period, and November of course, is no exception. There are a lot of bee club meetings especially once you get above the local club. Local clubs often meet monthly, so maybe this is not as relevant to them. But a lot of the state, provincial, national, international clubs will meet November and February of every year so it's a great time of year to find a meeting to go to expand your beekeeper knowledge.

Amy 18:49
I almost feel like December in our monthly management, especially for beekeepers up north, we're just going to tell them just sit back, relax. Have some hot chocolate by the fireplace.

Jamie 18:59
Yeah, that sounds actually quite nice.

Amy 19:02
All right, so that was our November monthly management for the Florida Beekeepers. We do have a monthly management series and we have an EDIS publication that we'll be sure to add to our additional notes and resources for this episode. But thank you so much for listening to this segment of Two Bees in a Podcast.

Stump The Chump 19:24
It's everybody's favorite game show, Stump The Chump.

Amy 19:35
Welcome back to the question and answer segment. Jamie, the first question we have, this person is asking if there are any Varroa treatment chemicals that are okay for bees but also inhibit beetles and moths. Sounds like, what is the one thing we can do to take care of everything in our colony?

Jamie 19:54
Okay, so I will answer the first question first, which is are there any Varroa treatment chemicals that are okay for bees, and then they put a comma, and we'll deal with what's after the comma next. So I would argue everything that is labeled for use against Varroa when used according to the label is okay for bees. I mean that's by definition of what the label is written for. The label would be written to make it maximally efficacious against Varroa but minimally impactful on honey bees. That's why there's a label. So, I'll say that again, any product labeled for use against Varroa when used according to the label would be safe for bees. So now, the question then is do you also get some side benefit of potentially killing small hive beetles or wax moths? So I will say none of the products that are available are marketed as such. So none of them claim to have a cross-benefit. There is one product, Checkmite, whose active ingredient is coumaphos. It's plastic strips that you would hang between frames to control Varroa. So the label permits a Varroa control use, but then you can cut the strips per the label and put them under a piece of cardboard and slide that on the bottom board of the hive with the strip underneath the cardboard where beetles will go underneath that cardboard and get exposed to the Checkmite and they'll die. So that product is labeled both for Varroa and for beetles but the label doesn't tell you to use it the same way for both. In the Varroa's case it hangs as a strip, in the beetle's case it's hidden under a piece of cardboard. So I'm going to be completely frank here. Many of these Varroacides, if something like a wax moth or a small hive beetle directly contacts, these Varroacides will likely have some activity on these particular critters. Now, I will tell you though, small hive beetles are about the size of a honey bee's head and thorax and the wax moths are about the size of a honey bee. So dose-wise, these Varroacides are delivering a lot more compound per body size to Varroa than they would be to small hive beetle, wax moths, and so my guess is that the impact would be pretty minimal. Again, with Checkmite being the only exception. Now, there are some organic acids such as oxalic acid, I'm not aware that that's been looked at against beetles, there's formic acid that potentially has some activity against young beetles' life stages and maybe beetle eggs. Again, I don't know that that's been looked at, but I can certainly conceive of a situation where it could kill the younger beetle life stages. And then there's thymol, which we know is using a couple products for Varroa, I think Apiguard and Apilife Var which potentially have some activity, again, only potentially, against eggs of small hive beetles or young small hive beetles. So I will say that the labeled products are used to kill what the product's labeled to kill. But there might be some minimal benefits against these other pests. But I wouldn't build my pest control of those other pests on the expectation that something targeting Varroa

will also impact these other pests. That's a long way to say you might get some benefit, but I wouldn't put all my eggs in that basket.

Amy 23:38
That's fair. Okay, so the second question that we have, this person was listening to our September monthly management podcast. What we were discussing was clipping queens' wings. And so this person said that they've clipped their queen's wings, but probably not well, and so the question is, can you describe how to do this properly? This is one of my favorite things to practice on drones. I love doing hands-on experience where we just go work with beekeepers, grab drones, and practice clipping wings so that you can be prepared to clip your queen's wings. So Jamie, tell us about how to do this properly.

Jamie 24:17
That's exactly what I was going to say, which is you start first with drones. But let me describe the process and then tell you how to eventually work your way to queens. So honey bees have four wings, they have two wings on one side of the body and two wings on the other side of the body. So let's just think about one side of the body where there are two wings. One wing is in front of the other and that wing is larger, and it is called the forewing. The smaller one in the back is called the hindwing. So the bees have a forewing on both sides of their bodies and a hindwing on both sides of their bodies. If you remove half of one forewing on one side of the body, then the queen is unable to fly. It is not necessary to clip half of both forewings or half of all the wings that she has. It's only necessary to clip half of one forewing. So what I normally do when I am going to clip a queen is that I will pick her up, usually with my thumb and pointer finger on either side of her her thorax, kind of gently squeezing as I lift her from the comb, and I'm right-handed, so I pick her up with my left hand so that her head is facing into my hand and her abdomen is facing away from my hand. So the wings, then, will also be facing away from my hand. And with my right hand and a little pair of scissors, I will kind of weave those scissors through the wings until I have one forewing in that pair of scissors. And then I'll snip off half of one forewing and then gently put her back on the comb, and let her walk away. So there are a couple of things to note here. These little tiny scissors are the kind that you can purchase to use for clipping fingernails. So that's number one. That's the small pair that you want to use because the standard scissors that we use to cut paper, they're just too large. So you really want those fingernail scissors. And the second piece of advice that I would give is exactly what you said early on, Amy, practice, practice, practice on drones. That way, you get a sense for how to pick bees off of the combs, you get a sense for how to hold them, you learn how to position them correctly, you learn how to kind of weave those scissors through the wings, you learn how to just snip one wing and not two, those kinds of things. And once you've practiced on enough drones that you feel comfortable, then you can graduate to the queen. I will say, don't freak out if you're holding a queen and you remove half of all four wings in just one snip, right? Sometimes, right when you're about to make that cut, another wing slides in or two wings slide in. Just don't panic. It's just the best practice is removing half of one forewing. But if you remove half of everybody, as long as the queen is moving around, she looks good, everything will be okay.

Amy 27:25
So let me ask you this. So you said half of a forewing. Does it matter which angle? Is it diagonal? Or does it matter?

Jamie 27:35
No, I go straight across the edge. And if you remove half of a forewing, if you remove it on the right side, she'll fly in a circle clockwise. If you remove it on the left side, she'll fly in a circle counterclockwise.

Amy 27:47
I was like, no, that's not true.

Jamie 27:52
In all seriousness, I just cut it straight across. I cut it straight across. That's all I do.

Amy 28:00
Oh my gosh, have you ever seen those cooking shows where a chef describes to a celebrity who's not a chef on how to cook? And basically, the chef will explain what needs to happen, and they're turned away from each other so they can't really see what the other person's doing. That's what I hope our listeners take our audio and do a video of them clipping their wings while you're describing it. That would be hilarious.

Jamie 28:30
Well, it's funny you said that, Amy, because in this Q&A, like usually when I'm answering questions in front of beekeepers, I've got pictures I can throw out there. But in this Q&A in the podcast, I find myself like, oh gosh, they don't have this in front of them. So how can I describe it in such a way that it's thorough enough to where they could go out and do it but not so thorough that just my volume of information just adds to confusion. So hopefully, you guys can practice on a lot of drones before you graduated to queens.

Amy 28:58
Definitely. We also have documents and publications that we can link to the show notes just to show people what that process is and so they don't have to listen to us over and over and over in this specific podcast episode. Okay, so for our third question for today, this person is asking, do you think a touch of pond salt and bleach to a feeder jar is harmful? So really, a lot of it is just what is harmful in a feeder jar? Is it common to put bleach in a feeder jar? Why would someone put bleach in a feeder jar and is that okay for bees?

Jamie 29:32
Yeah, great question. So feeder jars are used to deliver sugar syrup or corn syrup to bees. That's because they need to be fed some sort of carbohydrate because they don't have enough honey stores. For whatever reason, we've deemed that to be the case. That's why we feed them sugar water or corn syrup. Now, if that stuff stays in feeder jars too long, the bees aren't taking it fast, you can kind of get this filmy, moldy-looking stuff that grow in feeder jars. I'm not even sure what this stuff is. I've never seen an analysis on what type of organism it is. But it reminds me of black mold. Every beekeeper's seen it their feeder jar. So a lot of beekeepers will do a lot of different things to try to keep that stuff from growing in the jar. So there'll be a little bit of bleach that they add or a little bit of salt that they add. I've seen, heard about folks adding vinegar. But I would say that I've never added any of that stuff to jars while we fed bees. And I've definitely seen that kind of scuzzy stuff develop but I've never seen in

my colonies what I thought was a negative impact from having that kind of film develop in the jars. So what I would say is there's no research that I've seen that has conclusively answered this question. So always take the ultra-conservative approach, which is if we don't know the answer, we probably shouldn't be doing it. So then how do you deal with what the bleaching and the salt are actually supposed to be addressing in the first place? Well, the way that you deal with that is that you swap out jars and wash them in between. Let me give you an example. Let's say that I take a feeder jar to a colony, and I put on that feeder jar and the bees take it down really slowly. And a week later, there's a little bit of syrup left and there's also some of that black scuzzy stuff growing inside of the jar. What I would do is when I come a week later to feed, I would give them a new jar with a new sugar syrup and take the old jar back home with me and wash it out and get that stuff out of there. So that's how I would handle it. Or I would feed them less sugar water at a time so that they could take it faster. I will say, sometimes it's hard to beat it. If you think about it, we're feeding them a thick sugar liquid in a jar. So even when they take all of that liquid out, the inside walls of the jar are still kind of wet with sugar syrup, but you can't get all of that out. And that's really kind of what that stuff grows on. So even when bees are taking it relatively quickly, almost all feeder jars, ultimately, will develop that scuzzy stuff. I'm not trying to gloss over this topic. I think it is a topic that needs to be researched. We need to find out, first, if that stuff that grows in the jar really is a problem for bees. And then number two, if it is a problem for bees, how can we best control it? I'm just not convinced we know enough right now to combat it with something that we don't know if it's okay or not. Now, I will add one more little caveat. Some folks will add this to jars when they're feeding so much sugar syrup that the bees can't take it all quickly so that the liquid could itself ferment. And there's a belief that adding these things could slow the fermentation process and extend the life of the sugar syrup or the corn syrup in the jar. So regardless of why you're adding it, I would argue that there are other ways to deal with it that we know are not harmful for bees while we all recognize that these other questions need to be addressed. So yeah, the short answer is I don't know if bleach and pond water, they say specifically a touch of pond salt, but your touch of pond salt and my touch of pond salt may be two different touches, right? It's just hard to know how much is okay, and how much is too much. And I'm not even sure we're controlling a problem that needs controlling by doing it. There's a lot up in the air with this at the moment.

Amy 33:37
Yeah, well, it seems like what I'm hearing is basically you recommending to pay attention to the feeder jars, right? Whether they're using them or not and then if they're using them or not using them, take it away and clean them out and change it for new ones, right?

Jamie 33:50
Exactly. Perfect.

Amy 33:53
All right. So those were our question and answers for today. Thank you so much for sending in those questions. We hope to receive more questions from you either through our social media pages on Facebook, Instagram, or Twitter, or you can email us.

Serra Sowers 34:09
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.