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EPISODE 223 TRANSCRIPT

Jamie

Welcome to Two Bees in a Podcast brought to you by the Honey Bee Research Extension Laboratory at the University of Florida's Institute of Food and Agricultural Sciences. It is our goal to advance the understanding of honey bees and beekeeping, grow the beekeeping community and improve the health of honey bees everywhere.

In this podcast, you'll hear research updates, beekeeping management practices discussed and advice on beekeeping from our resident experts, beekeepers, scientists and other program guests. Join us for today's program. And thank you for listening to Two Bees in a Podcast.

Hello everyone, and welcome to another episode of Two Bees in a Podcast. Today, we are joined not just by a scientist, but by a personal friend who I've known for a few years now, Dr. Bram Cornelissen. I knew him when he worked at Wageningen University in the Netherlands. And Bram, I'm sad to say this, you have since left the honey bee world and now work with phytosanitary research.

But even still, we wanted to bring you on and let you talk about some of your honey bee research days, because I think your work is really interesting. So, Bram, welcome to our podcast. Thank you so much for joining us.

Dr. Bram Cornelissen

Well, thank you, Jamie. That's very kind of you to say.

Jamie

Well, it's great to have you. I was introduced to you when you wanted to do some small hive beetle work and you came to our lab, really, a number of times. But we're going to get into all of that. Bram, so the way that we normally start our podcast when we have guests is we ask the guest to tell us a little bit about themselves and how they got into beekeeping, because our listeners just want to know how you found yourself with the honey bees?

Dr. Bram Cornelissen

All right. Yeah. Well, I mean, I guess it started out a bit like for a lot of people. So, my dad's a beekeeper. He's been a beekeeper for over 40 years now. So, I got into it because of him. And of course, as a little kid, now and then you watch your dad and his bees and doing his thing.

And then a couple of years later, actually, you know, when I got to college, I wasn't that good at college, let's put it that way. I wasn't much of a learner back then when I was in the late teens, but

I had a lot of luck because I stumbled upon a job as a temp working in the National Pollination and Honey Bee Research Unit.

So, that's how I rolled into research actually. And yeah, I started on bumble bee research and rearing. And from there I got to work on Varroa, a lot, Varroa control. And, you know, step by step, I kind of climbed up the ladder, I sort of say. And so, my career went from there, and I started running my own projects and bee research. Yeah, and in the end, well, in the end – I hope I'm not finished entirely yet, but I got a chance to do a PhD on small hive beetle. So, that's kind of how I got into beekeeping and bee research.

But I've done so many things over the years. It wasn't amazing, right? I've been in research for 25 years, over 25 years, bee research. So, all kinds of things I came across.

Amy

That's amazing. You know, you piqued my interest when you said bumble bee rearing, but that's a conversation for another day, I think, maybe.

Dr. Bram Cornelissen

Maybe so, yeah.

Amy

Yeah, so Jamie had mentioned and you had mentioned that you've done a lot of research on a lot of different things. You know, I think when we were discussing bringing you on to the podcast, Jamie had mentioned that you had done a ton on small hive beetles and you had done that here at the University. Can you tell our listeners a little bit about your research?

I guess we don't have to focus on small hive beetle, but just maybe some of your favorite research projects, you know, and a little bit of just background on some of the projects that you'd like to share with our audience.

Dr. Bram Cornelissen

Well, for sure, I mean, the small hive beetle is definitely something that I really enjoyed working on, and the reason I got to work on it was because of, well, in 2014, it was first found in Italy, and in the South of Italy there was an outbreak of the small hive beetle. And you know, small hive beetle is a notifiable disease in the European Union.

So, each country has to develop a policy on the contingency and monitoring. So, they're obliged to do that from the European Union. In my role as a bee researcher, I had the opportunity to actually work on it because our country, the Netherlands, really wanted to kind of dive into knowing what the possible risks were.

So that gave me an opportunity to do some projects on it. It's never a good thing when something like that ends up on the continent, but it gave me the opportunity to do the research. And well, there were a couple of aspects that we were interested in. And the Netherlands, quite northern in Europe and we were wondering if it could actually, a small hive beetle could actually survive there.

And of course, we have the examples of Canada where we do have information that it now, at least, that it can survive and that the populations can survive. But at that time, we didn't have that. That was one of the questions I was interested in.

So, to see if it could survive and maybe also if temperatures would rise in the future, if that would change the outlook for the Netherlands. And then also we have greenhouses in the Netherlands in which bumblebees are used a lot, but also honey bees for pollination.

So, we wanted to know if these – well, these greenhouses are warmer than the outside environment, so, if these colonies would be more prone or more susceptible to small hive beetles and if it actually, the small hive beetles could survive in these greenhouses.

So, there were a couple of questions also related to dispersal to see how far they could actually fly. We were kind of anticipating the arrival of small hive beetle and asking questions about the biology and ecology of it.

Jamie

So, we were fortunate, Bram, that you wanted to do a number of those projects here. I forget the total number. And could you tell us kind of the types of research projects you did? And then specifically, I guess, about small hive beetles first, because we do have a question coming up about, you know, other things you've done in the honey bee world, but some of the small hive beetle research that you did and what were some of the key findings you made as a result of that research?

Dr. Bram Cornelissen

Well, I think, in total I did three years of research in Florida, in Gainesville, and it was a really amazing time. Again, thank you very much for hosting me because that was really a chance that was great. So, one of the first things that we looked at, one of the things that I was most interested in was the dispersal capacity.

And for that, we actually set up quite a large field experiment. That is one of the things I really liked. There's quite a lot of information we have from laboratory experiments, but doing like large scale field experiments with honey bee colonies, that is something I really like.

And I think it's something that not everybody does. It's difficult to do because you have quite large scale. There's a lot of effort you have to put in it and sometimes you don't know what comes out of it. But we really tried to do that well with the mark, release, recapture experiment where we released beetles that we marked on before we released them and we try to find them back in colonies that we spread out over a grid.

And that way, we actually could learn more about how fast they actually disperse and over what distance they would disperse. Now, our grid was up to 3.6 kilometers, I believe. I don't know what that is in miles though.

Maybe you can help me with that, but it's probably over 2 miles. But we also had some colonies that were a little bit further away from the release point. So, within the grid we could see that they traveled over 3 kilometers. So that's probably about two miles within 24 hours already.

But we also found them at these locations further away. And what I like about that is, I mean, we had anecdotal, you know, information that they would fly this far. We could kind of guess, but nobody really found them at the distances that we found them at. And that was over, I think, over 10 kilometers, 12 kilometers. So, it's quite a long distance that they are actually flying that we could actually find them.

Amy

Bram, I'm interested to know the methodology, like what was the method for your project to do this?

Dr. Bram Cornelissen

Well, it was kind of difficult because nobody really did it on this kind of distance, but also, we had to kind of mass rear them and mass release them. So, marking beetles individually was not an option for us. We had to find a different way to actually do it.

And what we did was we fed them with sugar water with a dye before release, so they would kind of feed on this dye and then the sugar water, and then we released them and then we could find them back in the colonies. And then we took them to the lab and then we squished them and we could see if they carried a dye or not.

We actually went a little bit further with another experiment where we also wanted to see what happens within an apiary to see how they disperse between colonies and if they were more attracted to weaker colonies or stronger colonies. And there we used a different technique for marking as well.

So, what we did there was we actually took beetles and we used this scalpel knife, and we marked them on the thorax. So, we kind of put scars on them. And because we could do that quite accurately, we could make different symbols on the thorax.

So, we had a Z of Zorro and we had, like, parallel lines. So, we could mark them in different ways for different treatments, which made it possible to see, you know, from what kind of colony, like a weak colony or a strong colony, if they would actually move or not.

In most cases, actually, the beetles just stayed put because they really, you know, once they're in a colony, they're comfortable, they have their bed and breakfast, and they're fine. They have a colony that will take care of them. So, they don't move that much anymore.

Amy

Jamie, how come you've never taught us how to do that?

Jamie

Well, Bram was the expert, so I'm just going to let him, I'm going to let him stay the expert.

Dr. Bram Cornelissen

Well, I'll come back one time to teach you guys if you want.

Amy

That would be awesome. I'm so glad I asked you that question because I was like, I wonder how they knew?

Dr. Bram Cornelissen

Well, you know, the fun thing is we did a lot of other things, I remember, that didn't end up in my PhD and we haven't published even yet. I mean, one of the things that we did was put them in a flight mill, right, Jamie?

Jamie

Yeah, I remember.

Dr. Bram Cornelissen

Yeah. That was awesome. I mean, we were like, OK, we have a flight mill that is meant for honey bees. And, you know, we'll see, let's see if we can put a beetle in a flight mill. I don't know if you know what a flight mill is, but maybe it's good to explain. So, it's this device that you can actually use to put small insects, for example, in, and it's like a Ferris wheel, basically.

There's a very low resistance like Ferris wheel that you can mount an insect on, and a flying insect – that's good to mention. And you can glue it onto a small stick, and then you can put them in the Ferris wheel and they will start flying.

Some of them, some of the animals they, some of the bugs, they won't fly, but you know, a lot of them do. And what we didn't know is small hive beetles would actually do that. And they did that. So, we did a couple of pilots with that and they would actually fly up to 6 kilometers in the flight mill. So, some of the beetles that we tried it out with – still something we need to publish. But you know, I mean, that's how it goes with science, right? But that was a lot of fun too.

Amy

What? I've never heard of the flight mill. So, how do you calculate how far they can go from that?

Dr. Bram Cornelissen

There's this software, you can link it up to a computer and it just counts the amount of rotations that the flight mill makes and it also records the speed. So, you can get some nice data out of it. I mean, you have to be careful because it's something you use to kind of compare treatments.

You cannot really get accurate data like in the field because I mean, they're tethered, you know, they're fixed to a device. So, it's not a natural flight that you're getting, but you can definitely get some information from it. So yeah, well, that's fun. It was fun.

Amy

That is so fun. So what other what other research on honey bees have you done?

Dr. Bram Cornelissen

Yeah. So, one of the other things that we looked into for my PhD was looking at how temperature, global warming, how that would actually affect the distribution of small hive beetles. We kind of worked with different scenarios. So, what we did was – there's a lot of data out there.

The stuff that Jamie published even way back when, I don't know it was for your PhD or not, but also other data on pupation, for example, like how long pupation takes for small hive beetles and how it's dependent on temperature and then moisture.

And so, we took all that data that is out there and we kind of made a model. Actually, Oliver Schweiger, who's very talented biologist who does a lot of modeling, he made this model to kind of see if temperatures would change, how that would actually affect this pupation.

So, we have pupation data related to temperatures, and then we could see what the what soil temperatures were around the world, and we could kind of make scenarios how these soil temperatures would change and how that actually would affect the distribution of small hive beetle.

And well, it was quite interesting because, I mean, we worked on a global scale. So, the resolution was not, you know, it's quite a low resolution that you work with, but still, you could definitely see things happening and kind of the predictions that we got. Even conservative predictions were that, in the future, that, you know, the conditions, if global warming is increasing, small hive beetles could even survive high up north like on Nova Zembla and Russia.

So, it was quite interesting to do that and gather all this information and get a feel of how far small hive beetles could actually get. And the other thing I really enjoyed, and I did that in the lab with Logan Cuts, Florida local, work on the pupation as well, but in greenhouse substrates. That was something that that we were interested in.

Like I explained before, like in the Netherlands, there's a lot of greenhouses, and pollinators are used, and the temperature is right for small hive beetles, but we didn't know if they could complete the cycle because, in general, there aren't any open soils. So, one of the substrates that we tested was Rockwool, which is used in greenhouses to grow plants on. And what we found was that actually the small hive beetles, they're not very picky. They really do well in this substrate to actually pupate.

And there were some kind of other substrates that we tested, and most of them actually worked fine for the small hive beetles. So, you know, they kind of show that even in greenhouses there is a risk, even if it the outside temperatures were not ideal for them to pupate or to survive, they could survive potentially in greenhouses and cause problems for pollinators there.

So, yeah, that's the stuff that we did in Florida, in the lab there, in the old lab actually, before the Florida lab was transferred to the new building. Yeah, it was a lot of fun, but it was also very valuable, I think, for us in the Netherlands to be able to do that in Florida where a small hive beetle is so present.

Jamie

So, Bram, thinking about your research again, having been fortunate to be involved in some of it, and this podcast is listened to about lots and lots of beekeepers all over around the world. So, do you have any take-home messages, kind of like big points worth considering from all of the research you've conducted, and just kind of to feed you one, you were talking about small beetle dispersal almost a dozen kilometers. So, what are some big take home messages you've given to beekeepers over the years just based off the type of work that you've done?

Dr. Bram Cornelissen

Well, the thing is that I think there's just a lot of good researchers out there that, you know, like you guys, you really focus on doing the research that is also necessary for keeping bees in a better way. I think one of the things I want to hand to beekeepers is actually listen to the researchers because they sometimes have really valuable points.

I know that beekeepers sometimes, also, you know, they come up with great creative things, you know, how to keep bees, but there's definitely a scientific basis for keeping bees. And I think there are some really good institutes like the Hebro lab that really translate the research into beekeeping. And I think that's very valuable, actually. And for the rest, I think it's very dependent on what kind of beekeeper you are. Like, if you're a backyard beekeeper or if you're a professional beekeeper. I mean, your ways about beekeeping are so different.

So, it really depends on where you come from, what you do, what you need. And so, I don't know. I mean, yeah, that's very important. In particular, I think nowadays, there's a lot of pests that are attacking our bees. We've had Varroa for a long time, and it still requires a lot of attention.

I think, if you're a professional beekeeper, you cannot do without good Varroa control, even a backyard beekeeper actually. And there's new threats on the horizon. I think it was two years ago that the Vespa velutina arrived in Florida or in Georgia. I don't know how far it's spread so far.

It's spreading quite far in Europe. And then there's Tropilaelaps, which is on the horizon as well. And if you think about it, I mean, that's something that, like I say, we need the research to kind of pave the way for beekeepers for the future, because there's a lot of lessons that we need to learn before we can deal with these threats, these new threats.

Amy

So, Bram, I know we've been a little, you know, back and forth of what we've been talking about as far as your research, small hive beetle stuff. You mentioned a couple of times about the Netherlands, and I want to pivot a little bit our conversation over to beekeeping in the Netherlands. We've had guests in the past that are, you know, from outside of the United States that have been guests.

And it's been really fun and interesting just to learn about, you know, different beekeeping, the differences between hobbyists, the differences between commercial beekeeping and just, you know, the industries outside of the United States. Because, really, Jamie and I, that's all we kind of know is the beekeeping in the United States. So, I'd love to hear a little bit about beekeeping in the Netherlands and about the industry as a whole.

Dr. Bram Cornelissen

Well, if you can actually speak of an industry, I mean, the Netherlands is quite a small country, right? We have, I think, about 17 million inhabitants. We have about 80,000 colonies at the peak of the season in the Netherlands.

And I think that the number of beekeepers hovers somewhere between 10 thousand to 12 thousand, depending on the estimates you get or where you get your estimates from. Yeah, so it's quite small scale. So, the largest beekeepers in the Netherlands, they probably have about 1000 to 2000 colonies in the peak of the season.

So, that's nothing compared to, in terms of numbers, at least, if you compare that to Florida or the US. But it's also a different kind of beekeeping. The professional beekeepers, they are definitely more focused on pollination or specialized pollination in greenhouses, for example. There are hardly any honey beekeepers professionally.

And that's mainly because there's no certainty that you can actually get enough honey each year to harvest. So, most beekeepers are backyard beekeepers, actually. They're small scale, have less than 50 colonies, and the average is actually between 5 and 10 colonies that beekeepers have. It's a different scale. It's a different beekeeping landscape that you have compared to what you have in the US. But that's the situation now. I mean, I've been looking into the history of beekeeping, as well, in the Netherlands and kind of started off with the questions regarding winter mortality a couple of years ago.

I think it was 2010, 2009, 2010 and people were asking, there was a lot of it about, you know, there were a lot of people interested in beekeeping and also in winter mortality. And then there were many suggestions of where it came from. I mean, for research, it was quite obvious that for Varroa, and then the viruses that they actually brought with, that these were the biggest problems.

But still, I kind of started thinking it would be nice to look back in history, like if we could learn any lessons from the past, if winter mortality was a thing in the past as well. And I did find some records of past events where a lot of bees died over winter.

And of course, in those times, you know, if you would go 50 years back, most of the times it actually had to do with winter being harsh. But on some occasions, you could also get some other information. That kind of got me interested in the history of beekeeping in the Netherlands.

And I kind of delved into that. And I'm not a historian, so history is definitely something different than, you know, doing biology. But what I did was I looked into the archives, and I found some nice, well, some interesting facts about beekeeping in the Netherlands in the past. And, and I focused that mainly on migratory beekeeping. And what I found, for instance, was that I could get toll records from boats that would pass a certain town in the Netherlands, actually, towns that don't exist anymore because they got swept away by storms, but where beekeepers would actually pass by.

And these records, they actually go back to the 15th century. So, there were beekeepers traveling over the rivers by boats with their skips to other parts of the country with their bees in spring. So, I mean, why would you want to do that?

The only explanation I could find was that they would actually take their hives downriver to places where there's good forage. These records were kind of indicative. And then once I got more into it, I learned that there was actually a system behind it from the 15th century onwards and peaking in the 16th century. Buckwheat was a very large crop in the Netherlands. We don't eat it now anymore. I don't know if you guys eat buckwheat or not.

Jamie

No.

Dr. Bram Cornelissen

Well, it was something that 150 years ago, everybody would beat buckwheat because it was a very, very large crop that was produced in the Netherlands. And that kind of started somewhere at the end of the Middle Ages. And for beekeepers, that was a chance because this buckwheat, I mean, it flowers in July and in August. So, it was kind of a period of dearth where they could actually get another harvest.

But not all beekeepers were close to the buckwheat. So, what they did was they actually travelled around the country to go there and to get the harvest. I learned that beekeepers would actually go, you know, travel by boat with coaches to go visit the crops that they needed to get the honey, and then would travel back to their hometown. So, they would probably be on the road for a long time as well. And this system actually continued in until halfway through the 19th century and even beyond that.

But what I saw was that from that period on, people started eating less buckwheat. But the reason was also because it was not as profitable anymore for farmers to grow it, and what became more profitable was fodder crops instead of food crops.

So, you can actually see a change happening in the 19th century where the buckwheat is disappearing and the sugar beet is introduced. From that moment on, sugar beet is introduced, but also fodder crops that are coming into play, and you can just see over 50 year periods the whole buckwheat aerial disappearing.

And with that you can actually see the numbers of beekeepers and beekeeping going down, like the honey bees going down rapidly. So, by the start of the Second World War, 1940s, the number of honey bee colonies went down from 250,000 somewhere in 1850, back to 30,000 colonies. So, it had a real impact, like the changes in agriculture, for the beekeeping industry.

Amy

That's so interesting, Bram. I was actually just a couple of weeks ago, I was at a buckwheat farm, actually. The bees definitely love it. You can smell it, you know, as you're walking through the field. It's a very interesting smell.

It's kind of hard to describe, but, you know, beekeepers here, especially in the northern climates, you know, I was up in New York and there was buckwheat growing and the bees just absolutely loved it.

Dr. Bram Cornelissen

Yeah, and it has a very particular flavor, right? They used to make cookies.

Amy

Yeah, it's not my favorite honey, but to each their own.

Dr. Bram Cornelissen

I mean, back in the days that was one of the main sources of sugar as well, right? So, there was an incentive for beekeepers to go out and harvest honey because they got a good price from it just as well as wax, of course.

But yeah, I mean, that changed a lot just because of the landscapes that changed and agriculture actually changed and that influenced the whole system, and then meant that, you know, from the 19th century onwards, beekeepers didn't have any profits anymore from their bees.

Well, Bram, you sound like a historian and a biologist, a gentleman and a scholar. So, it's really neat to hear this little side project that you've got. It sounds like it's not a little side project. Sounds like you've had to do a lot of reading and research to get this done.

But man, it's been great having you on the podcast and hearing about all the stuff that you've contributed to bee health over the years, your research with small beetles, etc. And I just can't wait to see whatever the end product is of this review of the history of beekeeping in the Netherlands. So, thank you for joining us on this episode.

Dr. Bram Cornelissen

All right. Well, it was a pleasure, really. Thank you, guys.

Stump the Chump

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

Amy

All right, welcome back to that question-and-answer segment. Jamie, we've got some questions about moving bees into an urban area.

Jamie

All right, well, I'll see what fake answers I can give.

Amy

All right. So, the first question that we have is you were mentioning in one of the segments that spring is a month that beekeepers should really check for queens and winter food inside the hive, you know, but of course, there's this thing called snow, which we don't really get here in Florida, but it snows in other areas, you know, during the spring. So, the question is, is there a threshold of temperature when you can or cannot check the hives and open the hive?

Jamie

Yep, absolutely. There are temperatures really under which you shouldn't be going into honey bee colonies, and honestly, I don't really look at the night temperature as much unless I'm going to be working them later in the day and I know the night temperature is going to drop really quickly.

I would say if you're going to work bees in the winter when it's typically cool, it's always better to work them during the warmest part of the day, which is, you know, probably somewhere in the 12:00 to 2:00 2-hour period. So, what I tell people, and honestly, what's in a lot of books and other recommendations is that you really want to work colonies preferentially when it's above 50°F or even 60°F.

That's about 10°C or 15°C. And the reason for that is below those temperatures, individual bees can get chilled, become unable to move, and can actually chill to death. What happens is when colonies start to cluster for the cold temperatures, they're usually clustering under that 10 to 15°C 50 to 60°F temperature window.

So, when it drops below 60 Fahrenheit, colonies start to cluster. So, any bee that falls away from that cluster can be chilled. And certainly, by the time you're getting in the 40° temperatures, it can be quite cold to be working colony. So, if you're breaking open that hive, heat is escaping and then you're removing frames, you're breaking that cluster.

Doing that below about 50°F or 10°C can cause them to struggle to recluster, etc. So, I'm saying kind of like the best-case scenarios, you want to work above 50, above 60 preferentially. Honestly, if I see bees flying, I usually feel comfortable working the hive.

With all of that good caveat out there, I need to say, but I have worked bees in much colder temperatures. And I'm not advocating it. I'm just saying I have with no apparent damage to the

hive. I'll give you one example. When I was either an undergraduate student or postdoc at the University of Georgia, I can't remember which of the two because I did both there, I was working with a colleague, Mike Hood, at Clemson University, and I remember I had to go sample some colonies and it was in the winter time and they had just had a sleet, which is just frozen ice storm. And I remember having to get back to an apiary. A tree had fallen in the road.

There was sleet on the tree. I remember when I finally got back to the hives to do the sampling that I was doing, I had to wipe sleet off the roof of the hive. It was probably in the 30s, which is, you know, less than 10°C. And I went into that hive, worked the colony, I did my stuff in there and I put it back together and the colonies didn't suffer.

But that is definitely, Amy, not a recommendation. It's always safest to work colonies above about 50 or 60°F. You know, if you want to be real comfortable, above 60. 50, I think, is okay. So, again, that's about 10 to 15°C.

Amy

Yeah, for sure. I like how I started this Q&A off by saying that we were going to talk about urban environments and the first question was not related to that.

Jamie

Well, it's getting there because what we haven't said yet is there's a gentleman who's asking these questions, and the gentleman is from Austria, and he's basically asking the series of questions to get down to the third question. We're doing all three questions for him, and it gets down to the third question that will in fact be about what you said.

Amy

Yes, yes, yes. Well, it goes to the second question. So, the second question is related to, you know, that temperature. The question is really this person is trying to move their bees to an urban city, and it's probably about a 3.5 to 4.5-hour drive. And so, the question related to temperature, is there a minimum temperature to travel with bees?

Jamie

I giggle because –

Amy

It’s a great question, yeah.

Jamie

I've never been asked that question because I've only ever lived in warm climates. So, I'm always only thinking about the maximum temperature, what you have to do to keep bees cool and not overheating while they're traveling. I'm not having to think about it the other way around where you're trying to keep the bees warm and not freeze them.

You and I had, then, to talk a little bit about this before we came on with the Q&A, and I tried to find some information online. I couldn't find any research projects, but I did find plenty of beekeepers talking about it in other contexts. And of course, the AI tools online summarize that. And the individual themself said that they have spoken to a colleague who's a migratory beekeeper, and he said that temperatures higher than 10°C, again, that's 50 Fahrenheit, wouldn't be a problem for bees.

Honestly, Amy, you and I were talking about beekeepers here in the US who are moving bees when there's snow on the ground, right? Therefore, you and I know that you can move bees and freezing temperatures. And the reason this question was so good and novel to me is I hadn't thought about what cold temperatures might do to clusters again, because I only think about it from heat.

And they're right if it's moving and jostling these hives, and let's just say for the sake of argument that it's 20°F outside, so that's somewhere in the neighborhood of, I don't know -5 or -10 Celsius. So, it's below freezing. If moving and jostling that hive while it's moving and bees fall away from that cluster and inside the hive around the cluster, you're getting those cold temperatures, yeah, then those bees that fall away are going to die.

They're not going to be capable of getting back to the cluster. The good news is, is clusters hold tight, you pack bees on the back of a truck and it's rarely a problem. I can't guess how many bee colonies this individual is moving. But even if it's only one or two, I personally wouldn't have any problems with it being, you know, freezing or above, you know, 32° Fahrenheit, 0°C or above.

I don't think that's a problem at all. And honestly, when you dip below that freezing temperature, you're out of my experience range. And I couldn't find any definitive research, but a lot of beekeepers were talking, you know, 20 to 40°F might even be the ideal temperature where you're forcing that cluster, but not too cold that they wouldn't recover and get back.

So, based on the temperatures that this gentleman's talking about, you know, 10°C, I think that's more than OK. So, anywhere in the neighborhood of freezing and above, I think you'll be OK at that distance.

Amy

Yeah, you know, it reminds me. So, this past year I did a training with the county extension agents here in Florida and we did a commercial pollination training. And so, part of the training was to work with commercial beekeepers and watch them load up a semi and ask questions. And it was the coldest day of the year, which, you know, in Florida is still around freezing. It was the coldest day of the year, and we didn't see a single bee. They were all just clustered inside of their homes. And they were like, so we had this bee training and had no bees and it was very cold.

Jamie

Amy, I appreciate so many things about you, and one of the things that I appreciate is that you always keep me on track. So, I'm listening to your story and going, oh my gosh, she's right. And then it dawned on me. Our biggest pollination event in the United States is California almonds where about 60% of the bees are moved to California every year. When do almonds bloom, Amy?

Amy

Yeah, I mean, February. January, February.

Jamie

During the coldest months of the year. 60% of the bees around the country, including from below freezing temperatures, are traveling to almonds every year during the winter for this pollination event. So, I would guess there is low risk.

Now, I would say we've got crazy brilliant listeners out there. And so, if any of you have experienced moving bees in cold temperatures, let us know on our social media and I can always refine my comments here. I'd love to hear from you about this.

Amy

Definitely. OK. So, for the third question in this Q&A, so, again, same person, you know, trying to move hives, trying to figure out if there's a minimum temperature. And since we're moving to an urban environment now, we're a little concerned if, you know, are there all the necessary regular things that nature are supplying to us?

And by that, I mean, do the bees need more food? Do they need less food in the city in the winter time? I guess, what would you say as far as being in a rural versus urban area, maybe some of the natural differences that beekeepers may consider?

Jamie

I really like this third series of questions, and it's great because they're really thinking questions. And it's great because there's really no definitive answers. Like the very first specific question,

do bees need more or less food in the city for winter? They need the same amount of stored food in the winter, whether you're in a city or an urban area, if the temperatures and the conditions are otherwise the same, right?

They need enough food stored to be able to power the energy that they need to survive that cold winter. Maybe what they're saying is, are they going to have to feed more or less if the bees are overwintering in the city? And that real kicker here, Amy, is it depends. Some cities around the world probably have great opportunities for honey bees in those cities.

Some cities around the world probably have terrible forage for honey bees. So, there's really no one-size-fits-all for the answer to that question. So, here's how I would answer that question. I would say there's almost certainly, if you're moving to a city, almost certainly a local bee club in that city. Reach out to those beekeepers and say, how much food am I going to have to feed in preparation for winter?

How much food are my bees going to need to survive winter in this city? And they'll give you those very specific answers. So, the next question is, should I consider an extra water supply next to the apiary? My comment is it depends. Are you by a little stream, a public pond? Then maybe not.

Are you the only water source in the area? Or are people's swimming pools next door the only water source in the area? Then you probably should provide water because you don't want bees to go to those sites. So, it's going to be really location specific. And you kind of have to know the water availability in the area where you're moving your bees in the city because there may be some natural water supplies, in which case you're OK.

But if those natural water supplies are public areas, that could be a problem if your bees are showing up at the city park and drinking from the water where everybody's trying to play. So, again, it depends. And that last question, are bees more likely to swarm in cities? Well, it depends.

If you have a lot of forage availability in spring, which you'll find out by talking to beekeepers, they're going to have that swarm impulse. If you have low forage availability, then there may be less swarm impulse. But my guess is, for those three points, is it's going to be location specific and there's no resource like the resource of beekeepers who already have to overwinter and manage bees in that city.

Reach out to them. I would say there's no overall rural urban pattern that I'm aware of. So, you're really going to have to play it by ear and know what the local knowledge says about swarming tendencies and food for winter and water supplies, where you're going to live, etc. Great questions. Thank you for them.

Amy

Yeah, that was fun. Those were great questions. It's always fun when our listeners can send us, you know, just three questions at a time and they kind of just build on each other. So, listeners out there, if you've got questions like this, don't forget to send us an e-mail or message us on one of our social media pages.

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

Jamie

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