

# Episode 170\_mixdown PROOFED

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bees, colonies, beekeepers, winter, beekeeper, indoors, shed, question, combs, ian, nest, honey, honey supers, temperature, beekeeping, feed, hornets, amy, honey bees, wintering

## 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, this is Jamie Ellis from the University of Florida Honey Bee Research and Extension Lab and one half of the host of Two Bees in a Podcast. Our team here at the University of Florida is going to be putting on a Bee College in August of 2024. That's August 23 and 24th. It's going to be in Panama City, Florida. The early bird registration for that Bee College ends June 2, and at that Bee College, we'll be teaching a wide range of beekeeping topics with all sorts of speakers. So there'll be topics for beginner beekeepers, for intermediate beekeepers, advanced beekeepers, and the like. So please consider joining us at that Bee College. Amy and I would love to meet you, and we can help you as you grow in your beekeeping endeavor. Hello, everyone and welcome to another episode of Two Bees in a Podcast. Today, we have a repeat guest, and it's a guest that many of our listeners will know. I'm talking about Ian Stepler, who's a commercial beekeeper. He runs the Canadian Beekeeper's Blog. And before we even got on the air I was chuckling because he said he lives in Miami, but Miami, Manitoba where it's much colder than where we are close to, which is Miami, Florida. Ian, thank you so much for coming back and joining us on Two Bees in a Podcast.

### Guest 02:09

Yeah, thank you, Jamie and Amy. I'm glad to be back. And yeah, I'm in the cold Miami, not the balmy, warm Miami. Most beekeepers or most farmers in this area retreat to the other Miami during winter.

### Jamie 02:23

Well, it's really exciting to have you on again. We know that you're very popular. A lot of beekeepers look to you for information. We know you do a lot of that through your online presence. But we're bringing you here today to talk to us about indoor overwintering, which is really kind of the latest craze in the bee world. Researchers are studying it, beekeepers are using it, and so I'm really excited that you're here to talk with us about this particular topic. But before we get started, even though you've

been on here before, if you don't mind giving our listeners a little update about who you are, how you got into bees, and you can keep it brief since we've had you before, but I know our folks will want to hear it again, and our new timers will want to hear for the first time.

**Guest 03:04**

Absolutely. Yeah, I'm a farmer in Miami, Manitoba. We have a grain cattle and honey farm, roughly 4000 acres of grain land and 650 cow calf operation and 1500 hive beekeeping operation. I'm the President of the farm, I'm also the apiarist. So it's a family farm. We split up the duties so it's quite dynamic. There's always something going on. I've been a director in the Manitoba Beekeepers Association since 2018, and I'm actually the chairperson right now. We're just about to have our 118th MBA AGM convention is going to be held at the end of the week. So I'm quite excited about that. But our family has been in the business for over 100 years. I guess 2022 was the centennial of our farm. I'm a third generation farmer. But I'm a first generation beekeeper. The farm's never had bees before. I've been in the business for 20 or 25 years now keeping bees.

**Amy 04:02**

Yeah, that's great. So a lot of our listeners know you because of your YouTube series. And one of the videos that's been pretty popular here lately is the idea of indoor overwintering. As Jamie mentioned, that's why we brought you on. I've been speaking to a lot of different beekeepers associations, and they're all asking about indoor overwintering, just this idea of taking your bees and putting them inside of a indoor location. So let's kind of start from the beginning. Can you discuss why a beekeeper, I mean, I think I can maybe make an assumption of why a beekeeper up north in the cold would want to overwinter their colonies indoors, but let's talk about the different benefits of this, if this is a standard practice, and I'll open it up and let you talk about why you do what you do as far as indoor wintering.

**Guest 04:49**

I can tell you I provide a bit of a perspective on the old school basics of indoor wintering. This is a huge conversation now because there's a lot of people adopting this method, and because of beekeepers adopting it in different areas, they have to include different things to be able to make it work. So there's places where you can achieve what I'm doing with very low investment, very easy conditions to manage through, because of certain things we'll talk about. But then you talk to other beekeepers in different areas where they have different conditions, and they have to invest in the facility a little bit more to be able to achieve the same outcome. So it's quite the broad conversation you can have with beekeepers. A lot of beekeepers like to speak to me on the very fact of explaining the basics, the basic concept of trying to winter bees indoors. I guess what it comes down to for me -- though, first off, beekeepers, the first thing they'll say, "Well, how much better is your winter survival when you winter indoors as opposed to outdoors?" And when you look at the performance between outdoor wintering and indoor wintering, the survivability is pretty much the same in a lot of ways. Neighboring beekeeper actually just beside me here manages his colonies exactly the way I do. Exactly. Right to the very week that we do our operations, he winters outside, wraps them up, and we tend to have much the same survivability over winter. So then the beekeepers just say, "Well, why the heck would you bring bees in, go through all that work to winter your bees?" What I do it for is because I hate wintering outdoors so much, I hate wrapping colonies, I hate dealing with the elements, I hate dealing with the wrap, I hate dealing with the mice, I hate all those aspects of wrapping colonies up, all that time that consumed it. I found that simply by being able to pick up colonies, set them down inside is just a lot better suited for

my management type. Also, I found that even though I talked about the survivability between outdoor and indoor, I find that by wintering indoors, by managing those extremes -- in Manitoba, we have extreme weather conditions. It will be like minus 35 for weeks on end, and then it'll get warm, and then she'll swing right back down. When we experienced those extremes within the winter, we find that the indoor colonies are somewhat protected from that. And in those certain years, the survivability will be a lot better. So I find the predictability of wintering bees indoors a huge asset for me. It also allows me to maybe achieve wintering smaller colonies more effectively. We'll build nucs throughout the summer period, and these nucs just get started, just get going. And they do their best to build to build this little winter nest, but it's still a small winter nest. These small little colonies that you're trying to take through winter outdoors, they struggle a little bit. So we'll see a higher death loss that way. Wintering indoors kind of provides more of a consistent condition for them to get them through winter. And the other thing is efficiency, in a lot of ways. Beekeepers will see what I'm doing, and I have a tendency to kind of micromanage things, I just kind of like controlling and manipulating the environment at all times. And I find that wintering indoors, I'm able to get these colonies through winter with less resources, less feed, right? So it just brings that aspect of cutting cost and just getting through the winter in better shape that way.

**Amy 08:29**

So, Ian, we're here in Florida. I complain about the winter in Florida, but I really have no reason to complain. Can you tell us just, as far as the season goes, when you say winter and when you're overwintering, how long is that?

**Guest 08:41**

It's a very long period of time. I'm going to talk Celsius. You guys talk Fahrenheit, but I'm sure we can convert.

**Amy 08:47**

Jamie can do the math for us.

**Guest 08:50**

I know our common language and temperature is minus 40. That's the same temperature between both of us. But we'll start winter in the end of October, we'll wrap the colonies up. That's basically when they quit flying. We'll put them into the shed, and they stay in the shed until winter breaks, which is typically in March this year. We're expecting maybe a little bit of an earlier break of winter heading into spring just because we have had a very mild winter, and there's not a lot of snowpack. So we anticipate a bit of an earlier spring. So we might be able to get them out in March. Typically, it's into April. So we're looking at over five months of confining these bees, which is a long period of time. The temperatures we experienced are anywhere between, what's typical, minus 15 degrees Celsius, and we run through long drawn periods of minus 20, minus 25 and harsh winter of minus 35 or something like that, which is accompanied by snow and by wind which makes Manitoba a very harsh place to keep bees.

**Jamie 09:56**

So, Ian, I find this absolutely fascinating. We don't indoor overwinter Florida but I travel a lot and get a ton of questions about this. So what I'd like to do is talk to you about the very specific conditions under which you overwinter these colonies. Before I get there, I just want to make sure I understand you

correctly. Given that you said you move your bees in to overwinter storage in October, but it's not really a time of the year that you look for, it's more of a condition of the colony. So if I understand correctly, essentially, you're moving your colonies in when you start to see the last foragers. In other words, when it's getting too cold for colonies to forage, is that correct?

**Guest** 10:32

That's correct. It's pretty much when the colonies are, in a sense, going into that winter states themselves, when they quit flying is pretty much it. We can't move them in too early, otherwise, if we do get warm periods while they're in the shed, we have trouble keeping them in the boxes because it's too warm in the shed. They want to get out and fly. So we try to push it as late as we can, to the point where the nest is set up as a winter nest. They're almost in that flightless state because of just the condition of the colony and the temperature. But also, because we're just about to head into winter, we want to get them into the shed before that mass of first snowfall.

**Jamie** 11:08

Ok. And so thinking about when you take them out in the shed, there's no environmental stimuli that make the bees want to, quote, wake up. So are you taking them out in March just because, historically, that's when colonies would ordinarily be coming out of winter?

**Guest** 11:21

This is a hard period of time as a beekeeper to decide when to actually take the bees out of the shed. What we want to do is, as you say, exactly reflective on the area that you're keeping your colonies. What we want to do is we want to take the colonies out of the shed where they can get up and fly and where they can start their development. And what we don't want is to bring them out, get them up to fly, start the development, and then have another extreme cold period hit them again, because we're kind of defeating the purpose. When we pull them out of the shed, we want them to get up and going and then off to the races in the spring. So we're trying to hold them in the shed as long as we can, to the point of time where we're anticipating Spring has arrived, and we can set them out, and we can let them get going. And that can be really difficult because we have warming periods as it comes. As spring comes, you'll have warm spells and cold spells, and trying to keep the bees nice and settled in their boxes while we go through these warm spells, it adds a bit of stress. They want to get out and fly but they can't because it's dark, and they're confined in a shed. So just how long can you hold them in that shed? A lot of beekeepers have actually adopted refrigeration to keep the sheds cool through those periods of time, and make them more of a consistent indoor temperature to relieve that up and down type of spring stress. I haven't invested into that yet. I'm seriously considering it because we seem to be getting more environmental conditions come at us that are more variable than I'm used to. In Manitoba, once winter sets down, winter is here and it doesn't leave. It's hard and it's cold and it's long for five months, pretty much, and I rely on that cold air to come into the shed, just to keep that temperature in the shed down. In different areas, like even if you go further west out in Saskatchewan, Alberta, you get more chinooks that come through and they get those warming periods. Those guys more readily have adopted refrigeration just to help take the edge off those warm periods to hold the bees in the shed just a little bit longer so then they can set them down into spring.

**Jamie** 13:15

So that's very interesting, Ian. There's a lot to unpack there. But you're saying you don't even use refrigeration, you just let the environmental temperature keep the shed cool. But you're also using environmental cues on the tail end of all of that to determine when to move bees out, maybe when you're seeing stuff blooming, etc. So I'm curious, then, what type of conditions are typically met in your shed versus what those the individuals who have invested in refrigeration? So, for example, light, humidity, temperature, what would you expect in your shed since you're just relying on the environment versus what would the folks who are investing in refrigeration expect for those three?

**Guest 13:51**

Absolutely. So like I said earlier, what I'm focusing on is just the basics of overwintering indoors. So it's very crude, it's very simple. But it focuses on the basics, and that's why it works. Basically, wintering indoors, what it's doing is it's removing the variability. Like, the outdoor colonies, they're continually experience to variable conditions throughout the years that are up and down and up and down, they experience the cold, experience the mild, so the bees are always being influenced by all these conditions. Wintering indoors, in a sense, we're trying to provide them an environment that is absolutely, perfectly consistent so we don't have that contraction/expansion, that continual upset of that cluster throughout the winter periods. They're just sitting there and they just, in a sense, drift themselves through the winter period. So I do that by controlling the temperature within the shed. It's very important. We found that the temperature around four degrees, which I think is 42 degrees Fahrenheit, seems to be the perfect temperature to winter bees. What they have found is four degrees is the temperature that tightens the cluster up just enough, but also, at the same time, just loose enough that it allows them to access the feed stores within their nest, and it is the most efficient temperature to winter bees on. Efficiency is the key on that. They found a little bit colder, you start dealing with condensation issues, and a little bit warmer and it increases their food consumption. So we try to target at four degrees, we try to maintain that through the entire winter period and keep those bees nice and calm and collected. The other thing we look for is humidity. Humidity is a hard one to manage. But I'm always monitoring the humidity within my shed. Because of our cold long winters, we're continually exchanging that cold air into the shed. I mean, you almost have to think of things in reverse as if you're wintering outdoors. Outdoors, you're trying to keep warm, but indoors are constantly trying to cool them because these bees are creating a tremendous amount of heat. Right? I think the math is roughly 20 watts of energy every colony is giving off. So if you do the calculation on that over 1500 colonies, we're looking at 35 to 40,000 watts of heat energy they're producing all the time, so I'm never adding heat to that shed, I'm always cooling it. And when I cool that shed with cold winter air, up here in the prairies, it's dry, it's cold, it zaps the moisture out of that room. So the relative humidity sometimes drops around 10%. It is extremely dry, and it makes it hard for the bees to access some of that honey that's maybe a little bit harder. A drink of water is what they need. So what I have found, the magic humidity numbers seems to be around that 40-45% in the shed, because what it does is it provides the cluster with the ability to have that condensation form just nicely around the outside of it, just on the layers. Not too much where it's actually dripping down the sides of the hives, but just literally droplets. And I found these bees go up and they actually drink the condensation that they perspire. They use that as their drink of water. So I've tried to target that the best I can. The other really important thing with wintering indoors, you need it absolutely completely pitch black dark. Like, so dark that you walk in the room, and you can't see anything, even when your eyes adjust to the darkness, like you're walking into the walls, you're walking into the bee hives. It has to be dark because if there's any ray of light, and you get into a little bit of a warming period, let's say the shed warms just a little bit,

you'll get bees flying out. We have a harder time maintaining them in their boxes. So that's basically what conditions I'm focusing on within my shed.

**Amy 13:51**

That's all really great, Ian. I'm happy that you were able to provide us numbers because now I feel like I'm able to share that when beekeepers are asking about overwintering and some of those ideal numbers that we have. So I wanted to kind of look at colony management while they are indoors. I know that you have many videos with your red light going through talking about feeding and what it kind of looks like in there. And so I'm just wondering, as far as management, are you feeding? And what does that look like? How do you decide what and when and how often do you feed? Do you have issues with foragers? I know that we just talked about that temperature, and making sure that they're able to kind of roam that brood nest, but not to the point where they feel like it's warm enough to be able to go out and forage. And then the last thing, just talking about humidity and just being indoors, let's talk a little bit about pests and diseases and whether you're managing for those or you're seeing any of that coming out of the overwintering?

**Guest 17:53**

When I set my colonies up for winter, I guess, in a lot of ways, it isn't a lot different than setting the colonies up outdoors. We want to make sure that they have enough feed to be able to get them through winter without having to supplement them throughout winter. I think that's really important. And to do that, we have to make sure we feed them early enough that the food is cured. We have to make sure the syrup or the honey in that nest is cured so they're not eating unripe food product. So I have a rule up here, when I feed my colonies up for winter, I make sure to have them fed up by October because there's some times we fall into cold Octobers, and if I haven't fed them up properly, they have a hard time taking the feed in October, but not only taking the feed but curing it properly for winter. I find when the colony is going into the shed with uncured feed, they started having moisture problems. Honey is hygroscopic, and it will take on the moisture within the environment. And if the honey is not cured, I think we fall maybe into a situation where food might spoil. That is absolutely deadly for a winter colony. So I always make sure to feed them appropriately. And the magic number, everybody asks, "What's the magic number you feed these colonies?"

**Amy 19:52**

That's what I was gonna ask, yeah.

**Guest 19:54**

And I go by a rule of thumb that an old beekeeper told me. Make sure you have one frame of feed for a frame of bees. That's what he tells me. I'm looking at, when I do the math, at a single, like I'm wintering single boxes here inside, just because it's single box takes up a lot less space, so I'm looking at a single box going into winter. Coming out of winter, they consume roughly five to eight pounds of feed per month. And I find my nucs, which, in a sense, is half a single, they will come out with like three to four pounds of consumption of food per month. So that's basically the figures that I use as I go through the fall, determining if they're heavy enough, I'm looking at that metric judging how long that winter is going to be, and I have to make sure that I have enough feed in that colony to get them through those five months, and even five and a half months, if we have a long drawn out winter, to make sure that I don't have to feed indoors before I get them outside. I fed indoors before and it works very effectively.



Everything is all in one room, easy to access and that, but it's very time consuming, and it's very messy. And the bees, you're coming into the end of the long winter, and then you're giving them this fresh syrup, and then they have now processed that and it just adds stress on the colonies, I find. So I try to do everything I can to have these colonies set up for winter with their food stores before they go in.

**Amy 21:21**

That's fair. Do you normally use entrance reducers before you go into storage, or how do you kind of manage that?

**Guest 21:28**

I definitely have reducers on in the fall just to help with draft when they're outside and to help the colonies protect themselves, in a way. I generally don't have trouble with that because the colonies, I call it anything that can't defend themselves. So robbing is not an issue for me. But moreso restrict the entrance just for that draft that comes in. When I bring them indoors, I take that entrance out. I don't run a top entrance.

**Amy 21:53**

So, Ian, you mentioned temperature and that 4 Celsius kind of being that target temperature to prevent foragers from coming out and kind of staying within that cluster. So let's move on to pests and diseases. So how do you manage for pests and diseases within that indoor climate?

**Guest 22:06**

I find that there's beekeepers that figure indoor wintering is going to help manage pests and diseases, almost like they think it's going to cure a colony if it's sick. Wintering indoors is actually exactly the opposite of that. Wintering indoors almost, in a sense, expresses or highlights the problems of disease within the colonies. Up here, because we hold our colonies indoors for such a long period of time during the end of winter, these colonies are getting stressed. And we find that even if we have over 1% mite loads within our colonies, it's almost detrimental for the overall wintering success. So we have to focus on ensuring that our colonies are mite-free in that regard just to make sure that they are able to endure the long period of time. I think it's because the little mites feed on the fat bodies of the bees. And that's what the bees need to build an injury the length of time. So it makes a lot of sense really, when you think of it. Nosema is the other huge plague we have within the shed. It's a gut disease. And the easiest way a bee can shed Nosema or handle that infection is by flying. When they fly, they poop and they can rid of the Nosema spores, and that, in a sense, maybe handled a little bit better. When they're confined inside for five and a half months, and they have a Nosema infection in their guts, it's not good. It's really hard on the bees to be able to get through that period of time. And what we'll find actually is what I'm finding right now, as we were getting to the end of winter, these colonies are maybe holding higher infection than the other ones in the shed. You can see that infection is causing them to go and poop on the front. Then whether or not the Nosema itself is an expression of the poopy front but is the stress of the gut disease, so it'd be Nosema or yeast infection or whatever like that. If a bee has an unhealthy gut, trying to get them through winter, a long period of winter indoors is really hard on them. That's where maybe wintering outdoors is an advantage where the bees can take a cleansing flight through the midwinter if they have the opportunity to. Indoors, they have absolutely no opportunity to be able to manage gut infection by flying.

**Jamie 24:27**

Well Ian, you've touched on it a little bit when you talked about pests and diseases, but I'm wondering what are some broader challenges of indoor wintering that beekeepers face?

**Guest 24:36**

Some of the broader challenges in wintering indoors, I think the challenge of trying to maintain a consistent environment with a very basic facility. I think when beekeepers attempt to do what I'm doing here on a simplistic basis as this, they don't consider the variability in the temperature and how important it is to keep the temperature low in the shed over the extended period of time. In areas where it's cold, like where I am, wintering indoors is very easy because you're just bringing the cold air. I was down in Iowa talking to beekeepers down there, and the challenge that Iowa beekeepers have, they tell me, is that variability in winter, the up and down and up and down. It is really hard in outdoor colonies to do that. One way to manage that is to bring them inside. But when you bring them inside to manage that up and down, you still have to manage that up because it gets warm in that shed. You have to keep it cool. So if you can't keep it cool with the air coming in, you got to cool it down somehow. And that's where a lot of beekeepers are adopting refrigeration to be able to maintain the cooler temperature just to take the edge off those warm days. And by doing that, if beekeepers are able to achieve a situation where they can manage that variability through winter, beekeepers are able to do amazing things. It relieves all that stress of the up and down, just helps the bees endure the periods of winter on very little stores. It allows beekeepers to bring colonies from the outside inside and shut them down. One of the hardest things for a honey bee hive in the northern climates is an extended late fall where those bees just fly and fly and fly and fly, where they've already shut down their nest, right? They're not producing any new bees. So if they're flying, they're dying, right? They're just knocking it off their age. Take those bees into a climate controlled building and avoid all that variability in the fall, in a sense, you just lock them in, and you get them through the winter, and then you let them go in the spring. So there's a lot of challenge to be able to manage that condition. And if beekeepers can focus on that specific challenge and maintaining a steady environment, then it's an amazing tool, I feel.

**Amy 26:49**

Absolutely. Here in the south, we kind of have the opposite problem. We do have those extreme temperatures. I remember first moving to Florida and wondering if I made the mistake of moving here in the summertime because we go through such a such an intense heat time. We go through our dearth season, the equivalent of people up north going through their overwintering. And so I'm wondering, what are your thoughts as far as beekeepers in the south with the refrigeration method? I can't even imagine what some of the electric bills may look like. But what are your thoughts? And do you think that that would be something that would be feasible for beekeepers down south? And what recommendations do you have in general about that?

**Guest 27:26**

It's interesting, I don't have a lot of experience in running a shed in a warm climate. Whereas you will be bringing colonies in that are still actively brooding, and you bring them in and it almost like shuts them down. I know some beekeepers in California, they're adopting the whole winter shed concept. It seems really weird to me. These guys are trying to manipulate the environment to adopt a cold winter to shut their colonies down, right? It's really interesting to me, and it's a strategy that's working for these guys. I'm in a situation where I have experience where my colonies are naturally shutting down. So they shut



down, they form that winter nest, they stop flying, I bring them inside to protect them from the environment and the variability. And then they take them out. So, it's natural -- it's not natural, but it's more of a natural progression. The guys in warmer climates, you'd have to ask the question, how can you take a colony from an active state, they're still brooding and they're still doing their thing, to bring them inside and shutting them down just like that? That's something I don't have any experience on. And I think there's beekeepers working on that. They seem to be able to make that shift very fluidly. But from what I understand, it's taken a little bit of experience. So if beekeepers in a warmer climate wanted to do much the same thing, I think it'd be a very good idea to tap into some of those experienced beekeepers in a warmer climate to figure out what are those conditions? And how are they setting those colonies up to be able to make that transition into a winter shed?

**Amy 29:02**

Right, you're essentially taking spring and summer bees and just putting them straight into winter. So that shock probably has something to do with it. Sounds like a really great research project, honestly.

**Guest 29:11**

There's a lot going on within the nest. There's a lot of dynamics going on all at the same time. And a lot of these dynamics, as beekeepers, we don't see necessarily, but they're all happening at the same time anyway. We learn to see those dynamics after experiencing, "Nope, that didn't work. Why didn't that work? Well, let's try this," and just understanding the behavior of the bees within these certain regions we keep them. If we can understand these behaviors, we can manipulate the behavior a little bit to be able to have them achieve what we want them to achieve. These guys doing it in California and other places down further south trying to shut the bees down are having a lot of success because you're achieving exactly what we're achieving up here in the cold climate. It's the shutdown of the brood nest, and by shutting these bees down, they get two things. For one thing, there's no brood so they can target the mites very effectively. And that's what they're doing. Just another strategy to combat against the mite. But the other thing they're doing, they're also shutting the bees down. So, during the slower part of winter, it's a little bit of warm, they're not flying, and they're not dying, so it just helps them shut these colonies down, conserve the resources they need to get them through winter, and maybe preserve some of that vigor and the girth of the colony, try to preserve some of that to get them into spring a lot sooner. But they're looking at winters three months, they're looking at winters two and a half months, three months. A lot of guys will take them out of the sheds into almond orchards, and or almond groves. Two and a half, three months is a pretty easy winter indoors. I'm trying to get mine through five, sometimes five and a half months. And that last month, month and a half is the hard part for me. Bees are just hanging on. I'm almost trying to do the impossible and push the limits right to the very end. Right when you get to the end of this long drawn out period, you really see the stress start to express itself in the shed. And we just hardly get through, but we do, and they come through, and it's an amazing thing. So, just a little comment on that.

**Jamie 29:13**

Ian, is there any type of colony monitoring that you do during the shed period? I mean, do you open colonies to make decisions? Or do you just base it solely off of the amount of time that they've already spent in the room?

**Guest 31:32**

It's kind of my own nature to fuss and micromanage and stuff like that. And what I've found over the years, as I'm trying to play with these bees through the winter is I found that I have to stay out of the shed and just focus on one thing, and that's just get them through winter.

**Jamie 31:52**

Well, Ian, that's great information. I really appreciate you spending some time with us talking about how you overwinter indoors. And I really appreciate you joining us on this episode of the podcast.

**Guest 32:01**

Yeah. Thanks, Jamie. Thanks, Amy. It's a pleasure to be here speaking to you again. It's quite an honor, actually. I hope through my YouTube videos and such, I try not to tell people how to bee keep, but I just hope that I can provide a little bit of perspective on how I understand bees and how I keep my bees and maybe this conversation on my YouTube video or on this podcast can help provide that perspective and maybe a better understanding for other beekeepers to apply into their own operations.

**Amy 32:34**

Definitely. Ian, I will have to put in this plug. Our beekeeper here at the University of Florida, he is a huge fan of yours. So he told me to tell you he says hello. This is my shout out to Stephen because he was super excited when he found out that we were interviewing you. So thank you so much for being with us today.

**Guest 32:51**

Yeah, I'm quite humbled. Thanks so much.

**Amy 33:05**

So Jamie, in our job description, we go around, and we are public speakers, and we talk to beekeepers all the time. And recently, in the past couple of months, I've been receiving so many questions about overwintering indoors. And of course, I'm like, I'm not even sure what it entails or what that looks like. So I'm really, really glad Ian was on today to tell us about his perspective of what works for his operation. So let's talk a little bit about that just as far as like the conditions of overwintering. And now, I feel like I finally have something to be able to tell people when I'm at events and speaking to beekeepers.

**Jamie 33:39**

Well, I'm going to start kind of at the top, Amy, and just say to everybody who's out there listening to us now, this is an area of active research. So you could probably talk to quite a few beekeepers and get slightly different answers. But what Ian said, you and I felt was worth repeating because you and I do get these questions so much. What Ian specifically said about the conditions, and that being complete darkness, no light at all. Secondly, targeting humidity of somewhere between 40 and 45%, and finally, keeping that temperature around four degrees centigrade. And those are the three things that he's thinking about when putting bees indoors for the winter. And again, there are people who are looking at these various factors at the moment, but what Ian shared is around what I consistently hear from other beekeepers who are trying this and finding some success.

**Amy 34:31**

Yeah, absolutely. Something funny when he was bringing it up as far as the heat that comes off of those colonies, of course, duh, Amy, why didn't I think about that? The colony is obviously warming up, they're clustering, they're emitting heat. And of course, in my mind, I don't know why I didn't think about it until he had actually said, "Oh, no, we actually have to cool it down because it gets so hot in those areas." So I thought that that was kind of fun, just to think about as well. So the second thing I wanted to kind of talk about, so I asked him a question about refrigeration down in the south versus he was talking about bringing his colonies indoors and kind of just keeping the, quote unquote, natural flow of what bees would do as their overwintering. I wanted to talk a little bit about just the difference between putting your colonies indoors once you're starting to slow down, once it's slowed down in the colony versus what I was kind of asking about was kind of that forced shutdown, right? So let's talk about that a little bit, too.

**Jamie 35:24**

Amy, this is a key distinction to make, because Ian's colonies are already going to shut down for long winters where he is. He's going to have a five, five and a half month winter, where the bees are experiencing very cold temperatures. And from Ian's perspective, he's just deciding on whether or not to let them experience that outdoors, where you can't really control the fluctuation of temperatures, or indoors where you can. So he's opting to move them indoors. But because it's so cold up there during that period, he doesn't really have to do a lot to keep the room cool. He has ways of cooling that room when it gets overheated. But he's taking advantage of the outside temperature in that context. What's becoming very popular in the 48 contiguous US states, and I'm curious for our international listeners if it's catching on overseas as much as it seems to be here, are forced winters when there otherwise wouldn't be strongly forced winters. Of course, every everywhere, even here in Florida, in the continental US, our colonies are going to experience winter. But here in Florida, it might be a week or two of those temperatures. Well, if some beekeepers are taking say, Hey, listen, we don't want any activity for a period of two or three months. So we're going to move the colonies and refrigerated units to force a prolonged period of dormancy when there otherwise would not have been. And that's slightly different from what Ian's doing. He's just taking advantage of the fact that there's going to be five, five and a half months of shutdown, and he's just trying to stabilize the extremes of that shutdown. Whereas a lot of other beekeepers are saying, "Let's force this shutdown and see if it improves colony overwintering success, gives us an opportunity to control Varroa, maybe reduces food consumption or gets them ready to go pollinate almonds earlier," whatever strategy they're using from. I will say that that is the one of the two that's really getting a lot of research attention. Is there a forced shutdown that's beneficial to bees? Now, you'll remember, Amy, we've had other interview guests who've talked about interesting things around overwintering bees. Maybe overwintering is a period of stress for bees, and if they had their way, they wouldn't have to do it. One of our previous guests was questioning whether or not we should be forcing overwintering at all. So I would say this is an area of active research. It's so great to have Ian join us to talk about his experiences with it and why he does it, but make the distinction between what he does and what you might see in warmer climates where folks are forcing it. And I would just say, Amy, you and I will do our best to keep people abreast with the latest research coming out on this topic because it's of tremendous interest to beekeepers everywhere I go.

**Amy 38:00**

Yep, absolutely.

### **Stump The Chump 38:09**

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

### **Amy 38:17**

Hi beekeepers, welcome back to the question and answer time. Jamie, the first question we have. So a beekeeper was reaching out to us, and they've got one deep box for their brood box. And they were just kind of thinking about whether or not they should put a box above or below that original brood box that they had. They're wondering if bees naturally build up or down. So let's talk about this a little bit. What does that mean? Do bees kind of start from the top, work their way down? Or do they start from the bottom and kind of work their way up?

### **Jamie 38:51**

So, Amy, this is a very interesting series of questions because they're all contingent on the initial situation that a beekeeper exposes his bees to. So let's think about it in the wild, and then work our way into a managed hive. In the wild, bees are moving into a cavity, and what they will start doing is building their comb from the top of that cavity downward. And they are generally trying to choose cavities that are a specific size, about 40 liters in volume. And when they do that, the entrance of the nest is not infinitely far from the top of the nest where they're going to end up building their comb. So they like the entrance of the nest within a reasonable distance of where they fixed their comb so that they don't have to start at the top of some really large cavity and then walk all the way down the cavity walls to get to the entrance. So that's what happens in a normal situation. In the beekeeper's case, he's mentioning, well, I've got this one box. It's full of bees. I want to add another super. Where should I put that? Is it better to put it below the bees, since, in the wild, they typically build from the top down, or is it better to put it above the bees, which I assume where this beekeeper wants that box at the end of the day. So I would argue that it probably doesn't matter in either case where you put it. So you might as well put it where it's most convenient for you. If you put it underneath the existing box, they will eventually build down into it. If you put it above the existing box, they will eventually build up into it. So I would argue that it's better to just go ahead and put it above the box that's full of bees, and they will grow their way into it. And I know this seems maybe counterintuitive, because, in the wild, the bees would start at the top and work their way down. But remember, this isn't the wild. The beekeeper has presumably given them a box that already has frames a foundation. If the bees were starting from scratch, and you added a truly empty box to that hive of no frames, no foundation, they would probably use it quickest if it were put underneath the box that has existing combs. But since it's got frames and since it's got foundation, I think they're going to use it in a very similar quickness, very similar speed, regardless of where you put the box. You might as well put it where you want it to be, which is, in this case, usually above that existing box. So that's what I would do. I don't think it really matters much. You could extend that question, Amy, to if you had a package of bees and you dumped it into an empty hive, a single box, where are they going to start building their comb? If you've got foundation, they're going to start at the top work their way down. Now, what if you empty that same package into a hive composed of two boxes of foundation? Well, they probably go to the top and work their way down most of the time. So we're creating these kinds of fictitious situations for them. So in that case, I don't think it's a problem at all to just put the box right on top of their heads, which is what most beekeepers do anyway.

### **Amy 39:17**

Essentially, it sounds like if they've got the space, they'll probably just build out and use it some way or another, right?

**Jamie** 41:03

Exactly. The real key, Amy, is having that first box full of bees that want to expand into a second space. And if you put it above their heads, even though quote, it's not natural, they'll expand into it very readily, as long as they're a full colony of bees and resources are coming in to support the growth of that colony into another box.

**Amy** 42:01

Yeah, definitely. So for the second question that we have today, Jamie, this person is asking if anyone is testing honey for contamination when using different treatments with honey supers on?

**Jamie** 42:36

Good question. And the short answer is there has been research on this topic. So let's kind of think about it this way. There are many treatments, at least in the US, that you can use in honey bee comb. Many is kind of subjective. There's a handful of treatments that you can use in the US to control Varroa or control bacterial diseases. This availability of treatments varies by country. For example, some countries can't use antibiotics, some can't use Varroa treatments, etc. But we'll use the US as an example. All of these products that you can use in honey bee colonies, have on them -- bum bum bum! A label!

**Amy** 43:14

No!

**Jamie** 43:15

I know, Amy, and listeners get tired of this. But the labels were written in a way that basically tells you whether misuse of that compound is going to show up in honey or not. So someone would have done residue analyses on using those products while honey is being produced to determine the language that goes on the label. So let me give you an example. If the label says do not use these products while your marketable honey supers on or while bees are making honey, etc., then the registrant, the individual creating the compound, or the individuals registering the compound, the companies doing this, they will have evidence that while honey supers are on, if you use these treatments, this stuff's going to show up in honey and you don't want that to happen. There might be some products that are okay to use when honey supers are on. And if that's the case, it will be on the label. The labels will basically tell you if the residues of these things have been found or not in honey supers based on whether they recommend that you could use those products when honey supers are on or not. Now, the best way, then, to keep contaminants out of your honey would be to follow the label on the products. If it says don't use them while honey supers are on, then don't use them while honey supers are on. And I'm not going to make specific recommendations because -- and I don't even want to name specific products because labels change, products go out of use, etc. But when I've looked at products in the past, some of them even have withdrawal periods. Not only can you not use them while honey supers are on, but you may have to have them removed from the hive, say, two weeks or a month before you put honey supers on, and that's an indication that their residues will hang around a little bit. But if you follow the label, then the residue levels that would show up in honey for human consumption

would be below the tolerable level. So you'd be okay. I think the spirit of this question is kind of asked a different way, which is, well, beekeeper use all these chemicals, do people look at their honey and see what's in their honey? Well, if you're using chemicals off label, then there's a reasonable chance that that stuff's going to show up in honey. And there's been scientists, myself included, who've looked at residue levels and nectar, pollen, or beeswax or honey or bees, and some of those studies are published. And you can see the residue levels of the products that beekeepers are using in these different matrices. Also, when commercial beekeepers, as an example, sell honey in bulk to packers, the industry that's going to take that and bottle it and sell it kind of to the masses, a lot of those packers are either required or routinely perform residue analyses to make sure that they don't have antibiotics in them or chemicals in them at levels that they're not supposed to be in. So to summarize this, yes, people have looked at this, yes, there's data out there on the residue levels of stuff showing up in colonies. And if you follow the label of the legally applied products, then those residue levels will be negligible or below levels that are allowable or non-existent all together. And so that's a very important thing to think through. But that doesn't mean that people aren't using compounds off label and that stuff's not showing up in marketable honey. And that's one of the reasons we tell people follow the label, follow the label, follow the label. You don't want that stuff to show up in the honey that you're wanting to sell to the masses. Follow the label, follow the label. It's the law.

**Amy** 43:20

Well, Jamie, I think you said it pretty well. Maybe we should just be done doing the podcast because there we have it, follow the labels.

**Jamie** 43:55

Follow the label. Surprise, surprise, right?

**Amy** 44:51

All right. So for the third question that we have, so I received a photo from a beekeeper. It looked like a swarm had taken over a bald-faced hornet nest. And you know those paper nests that they have, those brown nests? And so then on the side of that was just a swarm of honey bees. I think the question, generally speaking, is if swarms will take over and use that nest as far as space goes, and/or if they'll even use paper foundation. Is that what they call it in the wasp nest world, Jamie? I mean, are they going to use the comb? Or are they going to use the cells that those hornets build or not? I don't know. I'm not sure what the answer is to that.

**Jamie** 47:52

Yikes. So, Amy, I've got nothing but speculation here. In fact, when you were asking me this question, I didn't believe it was real until you told me who the beekeeper was asking the question, who I trust completely, and he went and physically laid his eyes on it. So I trust that as well. So I would have thought the picture that was sent was AI generated almost.

**Amy** 48:15

AI doesn't generate blurry photos. Sorry to the beekeeper who sent this.

**Jamie** 48:23



Long story short, I trust the beekeeper, I trust the picture. So now the question is what's happening here. So for the benefit of everybody here, we have bald-faced hornets here in the southeastern United States. And it makes a large paper nest bigger than a basketball. They're usually kind of rounded at the top and they become pointy towards the bottom, and the entrance of the nest is usually at the bottom of that nest. And bald-faced hornets are typical hornets. What they do is they chew wood to make paper combs. Our bees use wax to make their combs and our combs run up and down with the cells being oriented horizontally. Well, the bald-faced hornet, their combs run horizontally, and their cells are oriented vertically. So their cells run up and down while their combs run left to right. It's exactly the opposite of what our bees do. So when I was trying to decipher the question, I was thinking to myself, well, if you had an empty paper nest made by a bald-faced hornet, it's a cavity. I could technically see bees moving into that when they're looking for a nest site and using it. But then, I remembered, well, you'd have all of these horizontal combs and vertically oriented cells made of paper. It's incredibly unlikely that the bees would use those cells for their own. The cells are bigger than worker cells. Honestly, the bald-faced hornet nest is smaller than a standard cavity that a European-derived honey bee swarm would want to use. So my gut feeling here is that the bees just landed on this as a particular swarm and they're looking for a new nest site from this perch. Not that they're physically moving to this bald-faced hornet nest with the intention of using it. So that's 100% speculation. I don't think they use the combs. I don't think that they would use the nest site. If anything, if they plan to use this nest site, I expect them to just simply suspend new combs that they make out of wax from the bottom of this bald-faced hornet nest, rather than use the existing combs made of paper physically in this nest. I think this is just one of those incredibly weird circumstances where bees landed on a hornet's nest, with no intent to use it, and they probably moved on from there. If I'm wrong, if they do start to use it, I don't think they'll use the actual combs, but that they will make their own. But this is a new one for me. So I reserve the right to be wrong and see what happens in this situation. So I thank the beekeeper for sending us this question and the picture because it's just really interesting.

**Amy 51:16**

Well, so that kind of leads me to another question. Hornets will eat larva right? They're known to eat larva and they're known to honey bee larva. Do honey bees eat hornet larva?

**Jamie 51:27**

Yeah, that wouldn't happen in this case. So the adult hornets will collect meat to feed to their own young, so their own larvae. So the adult hornets will hunt, occasionally, adult honey bees or immature honey bees, if they can get into the honey bee nest. It's more often adult honey bees. They'll take those adult honey bees, chew them up and feed them to their own offspring. Honey bees, on the other hand, are not carnivores. So they would not be eating, they would not be seeking out and eating immature hornets or adult hornets.

**Amy 52:02**

Very cool. All right. Well, those questions were a lot of fun to answer, Jamie. Those were hard to answer, weren't they?

**Jamie 52:10**

Honestly, I'm not even sure if I said anything that made sense.

**Amy** 52:13

All right. Well, thank you everybody for your questions. Don't forget to send us more questions through our social media pages or by sending us an email. Thanks for listening to today's episode. This episode was edited and produced by our podcast coordinator Mitra Hamzavi. Thanks, Mitra.

**Jamie** 52:40

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