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SPEAKERS

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

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, and welcome to another episode of Two Bees in a Podcast. Today, we are joined by Chris Hiatt and George Hansen, both commercial beekeepers here in the United States. They will be talking about a new Honey Bee Health Coalition document called Guide to Varroa Management for Commercial Beekeeping Operations. In our Five Minute Management segment, we'll be talking about controlling European Foulbrood, and we'll finish today's podcast episode with our question and answer segment entitled Stump the Chump. Hello, everyone, and welcome to another episode of Two Bees in a Podcast. In this segment, we have a special treat for you. I have been a really big fan of the Honey Bee Health Coalition, which is a group of folks in the United States who are coming together to do things on behalf of honey bees. I've really touted some of their Varroa management guides and best management practices for a very long time. And I'm excited that, today, we have two commercial beekeepers from the US, both of whom work with the Honey Bee Health Coalition talking about a brand new document that that team has produced. The document is entitled Guide to Varroa Control for Commercial Beekeeping Operations. And so, here with us to talk about that today, George Hansen, who's a commercial beekeeper based in Oregon, owner of Foothills Honey Company, LLC. He is representing the American Beekeeping Federation at the Honey Bee Health Coalition, and he's going to talk about how this document originated. And he's joined by Chris Hiatt, who's a commercial beekeeper based in California, the owner of Hiatt Honey Company, and he's the vice president of the American Honey Producers Association. George and Chris, thank you so much for joining us on Two Bees in a Podcast.

Guest 02:33

Happy to be here.

Guest 2 02:34

Good to be with you again, Jamie.

Jamie 02:36

Yeah, I'm really excited. We were contacted a few weeks ago from someone from the Honey Bee Health Coalition talking about this new effort that you guys have put together, and I don't want to get ahead of myself. So, what I want to do is just for our listeners, George, if I can start with you, you know, you're both members of the Honey Bee Health Coalition. So, for the sake of our listeners, could you tell us about the Honey Bee Health Coalition? What is it? You know, what do they do? How did you find yourself a member of it, etc, so that we can kind of set the stage for this document that you put together?

Guest 03:09

Well, it's kind of a long story. I'll try and keep it short. But there were some meetings that took place, some symposium, where a lot of people were visiting. They were stakeholders, not necessarily beekeepers, but there were also people from the registrants, and also from different agricultural groups, as well as the EPA and USDA. And they were without any particular purpose other than just to kind of look at what was happening. And out of that, the idea came that perhaps there could be a coalition of stakeholders, people, not just beekeepers, but the broader suite of agriculture that might have an interest in or have an impact on beekeeping. And so out of a meeting, I don't know how many years ago, there was some talk about, well, formulating this organization. And then we found that we needed somebody to help us moderate it and to facilitate it. And so, we went to the Keystone Group out of Colorado, an organization that works with lots of different issues where there are people that have difficulty talking to each other, need to be brought together to find solutions. And so the Keystone Group helped us. We had a meeting up there in Colorado, up above Denver, in the mountains, and in the lighter air up there and everybody forgot their troubles, and we came together and decided what it would take to formulate it financially and structurally and so forth. And so, since then we've been meeting on a regular basis, have formed workgroups, so there are people from, as I said, you know, there are people from the Apple Commission, there are people from the corn growers, there are people from EPA, there are people from the USDA, there are pesticide registrants, you know, Bayer and others and Syngenta and whatnot as well as beekeepers. So, we are organized into workgroups, around the, like, five of them I believe. And so that's the basic structure of the Honey Bee Health Coalition. We have a couple of pretty good documents that are out there, and you mentioned one, the Varroa Guide, which has a lot of traction in the industry.

Jamie 05:14

So, George, I would say they're not just pretty good documents. You know, I really am a huge fan of the Varroa Management Guide that the Honey Bee Health Coalition put out first. I go around using it to educate folks about Varroa control. Since then, you've, if I'm not mistaken, developed a guide for

treating and controlling American Foulbrood, a Best Management Practices Guide, and quite a few other things. And it's really exciting what you guys have put together, and I love the fact that it's stakeholder driven. It's a lot of key individuals and key groups and organizations that are trying to make a difference on behalf of bees and beekeeping.

Guest 05:44

Yeah, I mean, just real quickly, some of the best management practices are after the Almond Board came out with their guide for best management practices, most of which had to do with -- a lot of it had to do with what to do when bees are present, and so forth. Now, the coalition has the MPs for soy and corn, and they're working on one for apples and blueberries. And so, it isn't just for beekeeping best management practices, it's for agricultural best management practices where bees are present or are impacted.

Amy 06:14

Yeah, as Jamie mentioned, you know, every single class that we teach, we always bring up the Honey Bee Health Coalition website. I mean, there's just so much content, so much education, you know, lots of different outreach opportunities. And we really appreciate all the work that the coalition has done and put together for us to be able to share. And something, you know, the reason why we brought you both on today was to talk about this new guide that you just published. And so the Honey Bee Health Coalition just published a guide to Varroa mite controls for commercial beekeeping operations, which is very, very exciting, right? So, something for commercial beekeepers. Can you, George, can you tell us about this document and how it kind of came about, and then, you know, Chris, if you have anything to add on to that, that'd be great to hear about.

Guest 07:00

Yes, it was several years ago when we started worrying a lot about amitraz resistance to control Varroa in a discussion in one of the workgroups. We just realized that, you know, the Varroa guide talks about a lot of things, but there are very few actual practices in there that are applicable for commercial beekeepers. And in reality, commercial beekeepers have become extremely reliant on the use of amitraz as its control for Varroa, and in particular, an unregistered form of it. And as resistance, and also the difficulty of politically managing that issue of the fact that we're using a material in an unregistered fashion, we're really vulnerable. And it seemed like we needed a plan B, and although years away from anything being registered for use. And so, in the interim, the discussion went to this idea of, let's talk about what we have that is registered and how to use it on a commercial level. A lot of beekeepers don't use it, commercial beekeepers, because it's either too expensive, or it isn't as efficacious, or there are problems with it, or this and that. So, we wanted to try and find a way to put together ways of using registered materials in a system where you use them one after the other, or you rotate them or whatever it would take. And in order to teach that, we wanted to think about using actual case studies, finding beekeepers in the United States who are actually doing this to talk about what it is that works and how they came about it, what doesn't work, what are the costs, what are the upsides and what are the downsides? And that's what, you know, it took us two years to develop a document with these case studies, which is now what is being released.

Guest 2 08:47

Yeah, it was a monumental task, just like George was saying. I mean, there was hour and a half zoom meetings monthly for a long time. But I would be remiss not to mention a few other people that really helped on it, Dewey Caron, you know, from Oregon State, Mary Reed, Tammy Horn Potter, both are inspectors, Texas, Kentucky, Jerry Hayes from Bee Culture, Tom Steger from EPA, officers from Eastern Missouri Beekeepers, I mean, that groove we just had went through the case studies, and not argued, but we really went over it so we could have a good enough document that you felt like you're at a bee convention talking to a whole bunch of commercial beekeepers, getting inside information, and I think that's what it is. And it's needed, because changing, you know, how the Varroa mite has changed and the virus loads and how, you know, what's acceptable or not anymore for monitoring and, you know, three mites per 300 or whatever. It's changed over the last 15-20 years, it's really changed. And so, this is kind of, hopefully, it'll be a living document, but just seeing those case studies that George mentioned, I think you can really -- a lot of the, maybe, smaller beekeepers and some of these other commercial beekeepers that don't know how to rotate quite yet, you know, between amitraz and oxalic and formic and Apiguard and Hopguard, all these products. It's just kind of a one-shop stop that you can look at and say, "Hey, I can't remember, what's the upper-temperature range for formic? You know, is it 105? Or what's Apiguard? What's the temperature?" You know, you don't have to go and look, it's this one document, you just look at it. Same with oxalic. Same with all these other products. We're just happy that I think this will help a lot of commercial beekeepers, they'll help them manage their Varroa better.

Jamie 10:33

You know, I have a lot to think about this, because like I said, the first guide was so good, and it's so encouraging to me to hear all of these folks who you said were involved: Dewey, Mary, Jerry, you said, Tom, Bob, Tammy, others, the two of you and others, I'm sure within the auspices of the Honey Bee Health Coalition. I think the really neat thing is that you guys are doing case studies, because from experience commercial beekeepers often will take advice from other commercial beekeepers, you know, faster than they would or quicker than they would, perhaps, from other folks. And I think the case studies that you guys developed and put into this particular guide are really key to success. So, when I think about all these folks, and within the umbrella of the Honey Bee Health Coalition, you know, who was responsible for coordinating the logistics? How, you know, you said it started a couple of years ago, but and there were there were monthly meetings, but how did you, you know, develop this document along? You met monthly, you decided on what beekeepers to include, you know, what made the cut? What didn't make the cut? How did you coordinate all of this to produce the document that you ultimately released?

Guest 11:38

Yeah, Matthew Mollica, probably the person who contacted you, is the keystone representative who is doing this particular project along with a lot of the rest of the coordination for the coalition.

Guest 2 11:51

And then Matthew, we had a consultant, Eric Von Schrader, he kept us the lines, and that was kind of his specialty. He edited and kept us on task. "Do you really need this, you're being redundant saying this over and over again." And so, between Matthew and Eric, that really kept us on, kept us on the rails moving along,

Guest 12:09

You know, we learned a lot. Actually, initially, I was thinking, there has to be a half a dozen people out there that don't use amitraz and are being successful and are just using registered materials or whatever. It was really, really difficult to find the case studies with people who, on the one hand, were actually doing what we're talking about, rotating and using, you know, resistance stock or whatever, and at the same time, were willing to tell us about it and have their name and pictures involved and stuff. And so, it turned out that, you know, that it was pretty interesting to try and find people. And none of us are pure. And that's the whole thing that I think comes out of all of this is that we're all struggling with this task. And each one of those case studies, they're in different parts of the country and doing different things, but each of us are approaching it a little bit differently. And haven't -- I don't think any of us have put all of our eggs in one basket. That I think is the message is that we're finding ways of using lots of materials and strategies that are making a difference. But boy, it is not a silver bullet. That's for sure.

Amy 13:19

So, I am really, so, today, we're recording this on June 21. And I know that the Honey Bee Health Coalition actually just released it, I have not had an opportunity to look through the document, and I am excited to see, you know, the different case studies and really, the information and the content that you've put in there. Is there, you know, what are some of the key things that you found that our listeners will look forward to when they open this document to take a look at it?

Guest 2 13:45

Well, I think, just you'll see from the case studies, there's a rotation for Varroa mite guide from, you know, spring, what you're using in spring, in the fall. You'll definitely see a pattern. And then I really do like the pros and cons we listed of, is this product too expensive? Is there a problem with heat when it's too hot, register material, etc.? And I like the lessons learned. I mean, you're getting lessons learned from these commercial beekeepers, what works, you know, you can use this while honey supers are on, you can use this, you know, etc. But I think those lessons learned are very valuable. And with them, I think, you know, you're getting a real close look at operations in different regions of the countries, and you can also see what they're doing. Besides that, they're also using a lot of hygienic queens, from different places, mite biters, the Hilo project, those are all -- in a lot of those case studies, you'll see that. So, there's a whole mix of what people are doing to try to control Varroa mites.

Amy 14:48

That's pretty cool. I'm excited to, I'm excited to read it. How many years of experience do you think has come together to make this document?

Guest 14:56

Well, I don't know. I'm coming up on 50 years. I don't know, but, I mean, that list of people that you just, that Chris just rattled off, I mean, those are some of the most experienced. They've been around, you know, they've seen all of this and have seen the changes, and then you also have, you also have some early adopters. I mean, a bunch of the stuff we're talking about is like brand new. I mean, certainly, well, I don't know, I guess, overwintering indoors is not a particularly brand, brand new idea, but it's certainly one that's getting traction now. And there hasn't really been a very good discussion of it up until just very recently. And there are some people that jump on that kind of stuff, and other people wait around for everyone else to figure it out first before they put their money in the game. Same way with the resistance stocks, it's expensive, and there are a lot of lessons to be learned there, I'll tell you. So, it's not just a matter of putting together old experience, it's also lessons learned from early adopters, new things that just we don't have very much experience with yet. And so, there's some pretty good discussions there about all of that.

Jamie 16:10

So, when I think about this document that you've written, I mean, it's got commercial beekeeper in the title, that's, that's your main target. You're hoping to change the commercial beekeepers approach to Varroa control. Can sideliners pick this up and gain some insight? Can hobbyist beekeepers as well, folks even outside the US maybe?

Guest 2 16:27

Oh, 100%, they can, yeah, there's, I mean, it just shows different regions of the country, what different beekeepers are doing. I mean, we have the Card family, Andy Card, Massachusetts. I know he runs Louisiana, they run a lot of hives. I think 30 to 40,000. I mean, the Millers, multi-generational, I mean, I think it's seven generations of farming and beekeeping in North Dakota, California. I'm just second generation. I mean, the Hycomes from longtime queen breeders, I mean, so, you've got some valuable groups, beekeepers from different regions of the country. So, I think that's valuable for anybody, even international folks because we're showing you what's worked in the past and what hasn't in this case study,

Guest 17:09

You know, the thing that we really haven't talked about, but in the preamble in the beginning, the reason for the document is actually written in the first pages about the issue of using one material solely. In this particular case, we're talking about amitraz and the trouble you can get into when we are flirting with issues of resistance now. And it's very clear that beekeepers are increasing the frequency of their treatments, as well as the dosages and, you know, you can only do that for so long before you're courting disaster. So, anybody, no matter how many hives they have, is probably going to be affected by the loss of amitraz or the partial loss of amitraz. So, it's important information for everyone. But the problem with the Varroa guide is that most of the things that are in there, they're really not applicable at a commercial level at large numbers of hives that have to be handled. And so, that isn't to say that some of the things that commercial beekeepers do can't be applied on small scale, but it is the

opposite's not true. Things that can be applied on a small scale, almost for sure, can't be applied on a commercial level. So, that's a nuance in your question, to your question.

Amy 18:28

Alright, so I've got the big overarching finale question, and that is are you optimistic that we will beat Varroa?

Guest 2 18:36

Oh, I think so. I mean, there are so many things, you know, with technology and things that are coming out. I mean, I think the big part if the viruses, you can keep your beehives alive with the viruses after their pass with Varroa. But I mean, the Honey Bee Health Coalition has an orphan compound working group where there -- had old miticides that were thrown on the shelf and now they're trying to bring them back maybe and apply them in a different way. That's exciting. I know there's, at Cornell University, has some lasers, and then there's, and there's just a lot of different things. I know there's some probiotic work and different way. I mean, everyone's excited about Randy Oliver's, you know, glycerin with oxalic and the towels. And so, they're, I mean, we're throwing everything in the kitchen sink at these things. But, I think there's room to have optimism for the future with technology or in AI if it ever is feasible to do it and not be too expensive. I think there's reasons to be optimistic.

Guest 19:36

And the one thing you didn't mention is the breeding for resistance stock is really making progress. And in my own outfit, where I'm using the Hilo stock, we're seeing significant improvements, although, we're not to the end of the road there, but there are several breeding projects out there that have clearly shown that, with breeding, you can reduce the dependence on chemical controls on the commercial level. So, I'm really, really convinced that if we stay with it and, where it's applicable, we can have bees take care of themselves as far as mites are concerned with resistant stock.

Jamie 20:23

So, guys, the Honey Bee Health Coalition has a really great website as you both know. We're going to make sure and link the website as well as the direct link to this document in our show notes. We'll also include the direct link to the older Varroa Management Guide, just so all of you listeners out there can have a look at both documents. I consider the original Varroa Management Guide to be, in my opinion, the best Varroa Management Guide on planet Earth. And I know this new document that you guys have out with case studies for commercial beekeepers and these newer strategies and rotations of chemicals and other hints, etc. just to be a great companion document to that document. I really think that the Honey Bee Health Coalition has done a great job in that regard. We'll make sure and link everything in the show notes. But, I'm curious, Chris, George, or is there anything else that you want to share about this effort? Any other outlook on the future that you want our listeners to know as we kind of wind down?

Guest 2 21:19

Well, I'm glad George mentioned, I was just thinking miticide control, I totally forgot about the breeding aspect, I think, yeah, that's more long-term. But that is definitely -- you would think in the future, wouldn't that'd be great to get back to where we used to be and not putting a pesticide into the hive? I mean, that would be great to shoot for. But one thing I'm excited about, it's fairly new, is that, you know, we've been working trying to get a good honey price for the American beekeepers to stay in business. We're excited that we got the preliminary win, I guess, you could say, in an anti-dumping suit against Vietnam and some other countries. And that, you know, is in the very preliminary stages, but that affirmative the International Trade Commission voted in our favor, we hope that can really help commercial beekeepers, you know, instead of, you know, I know pollination can be hard on your bees going from crop to crop to crop and sprays and stuff and really good honey flow can help cure a lot of problems, and you get paid a fair price for it. That'll really help almond pollination, and it all crossed, apple, blueberry pollination, it really will help any beekeepers, we're excited about that.

Guest 22:29

With all of our problems, there's a lot of good stuff going on. Stuff that PAm is doing and the Bee and Butterfly Habitat Fund and several other efforts around, just, around forage in general. There's a lot of interesting things going on. Some of them, the coalition will be involved with, and other ones for different organizations. So, but, it's a kind of scary time, but it's, you know, and economically this is really challenging. But, you know, I want to be optimistic about moving forward on these issues.

Jamie 23:06

Well, George and Chris, I really appreciate you both so much joining us to talk about this very important output of the Honey Bee Health Coalition. I think it's going to be of great value to beekeepers everywhere.

Guest 2 23:16

Awesome. Thanks for having us.

Guest 23:17

Thank you.

Jamie 23:18

Absolutely. Everybody, that was George Hansen, who's a commercial beekeeper based in Oregon, owner of Foothills Honey Company, LLC, representing the American Beekeeping Federation at the Honey Bee Health Coalition, and Chris Hiatt, who's a commercial beekeeper based in California, owner of Hiatt Honey Company and vice president the American Honey Producers Association. They were joining us talking about the Honey Bee Health Coalition's new guide to Varroa control for commercial beekeeping, which you can find linked in our show notes. Thank you so much for joining us on this segment of Two Bees in a Podcast.

Guest 2 24:02



You're listening to Two Bees in a Podcast brought to you by the University of Florida's Institute for Food and Agricultural Sciences Honey Bee Research and Extension lab.

Amy 24:22

So, last week in our Five Minute Management, we spoke on American Foulbrood, and this week's Five Minute Management, we are going to be talking about European Foulbrood. And so, Jamie, I'm going to go ahead and start the timer. We're at five minutes, so tell us how to manage European Foulbrood.

Jamie 24:43

Amy, one of the key ways to manage European Foulbrood is to remember, first of all, it's not American Foulbrood. So, American Foulbrood, if you recall, can form spores, and so, even when you treat the colonies, the spores can remain behind so you have to take drastic actions to deal with it. European Foulbrood, on the other hand, is caused by bacteria that does not form spores. And so, when you treat to control it, it actually goes away. So, there's really two strategies, broad strategies as it were, to address European Foulbrood. The first of those is prevention. The second of those is sort of how do you treat it once you have it. So, in the prevention category, the first thing that you can think of is sanitation, right? Just be a clean beekeeper. If you find it in one colony, sterilize your hive tool and your glove and your smoker before you move to another colony. The second way of preventing it is start with new equipment, new hives, new packages, new colonies, new frames, new smoker, new hive tool, so hopefully, you don't bring it into your apiary in the first place. Third, you can use hygienic stocks of bees, European Foulbrood affects, usually, the uncapped stages of bees. It can affect older bees as well, but it's usually the uncapped stages. So, just simply having hygienic bees, queens that have -- who have been bred to have hygienic traits can potentially help reduce the impact of European Foulbrood because the worker bees are always removing the young larvae that are sick with the disease. And you can also treat prophylactically, so in advance of the problem, with antibiotics. I will stress that I am not a huge fan of that. Furthermore, the labels on the antibiotics for a lot of the available antibiotics don't permit that. So, I would say, rather than using antibiotics for prevention, you might only consider using antibiotics for treatment. So, as we move into this treatment category, what do I mean by that? Well, if your colony -- if a colony is found to have European Foulbrood, then you might consider treating it with an antibiotic. Since it does not produce spores, when you treat the colony, the disease will go away. Keep in mind, in the US, if you're listening to us, you have to have a VFD or prescription before you're able to even purchase antibiotics for use in bee colonies in the first place. There are some non-chemical methods as well. You can add bees and brood to the colony that has European Foulbrood to beef up the population so the bees can take care of themselves. You can consider requeening that colony, because clearly the stock that you have is susceptible to the disease. So, perhaps, putting a new queen in there will increase, will introduce a stock that's not susceptible to it. A lot of beekeepers like to feed their colonies with European Foulbrood one-to-one sugar water. It's very common to try to fix EFB just by feeding bees. And the idea is that, usually, bees when they've got enough food, when they're growing and nectar's coming in, they can take care of the disease themselves. So, feeding one-to-one sugar water can simulate that. And then a final method is what we call a shook swarm method where you shake all of the bees off all the combs and out all of the boxes from a colony that has European Foulbrood into new equipment, treat them with an antibiotic, and then you can sterilize the

equipment that had it or store the equipment or do away with the equipment all together. Our team has put together a really good document on controlling European Foulbrood in honey bee colonies, and we'll make sure and link that in our show notes so that you'll know how to find it and that additional information associated with it.

Amy 28:28

Wow, I think this was one of the first ones that you've done in a while where you had at least a minute left.

Jamie 28:34

Whoa.

Amy 28:34

Yeah, so, well, I have another question for you.

Jamie 28:37

Maybe I should have spoken slower. Wow, that was an unusually impactful laugh there.

Amy 28:47

Yeah. Pretty good. So, okay, so just about American Foulbrood and European Foulbrood, is it, so I read that it was, they're called American Foulbrood and European Foulbrood because of the person who had found it or the people who had found it versus where they actually originated from. Is that true?

Jamie 29:08

Yeah, the names have nothing to do with where they actually are native. It has everything to do with where the people were when they found it. And I always tell people, and I know we have an international audience, so this joke might be lost on folks but I always tell people, you know, as a sense of national pride, American Foulbrood is the nastier of the ones. But in all seriousness, but in all seriousness, it's problematic principally because it's spore-forming, and once you have it, it's incredibly difficult to get rid of it, whereas European Foulbrood, there's some management techniques you can use to get rid of it. Frankly, Amy, a lot of times, bees will just pull out of it on their own when there's enough incoming nectar or the colonies are strong anyway, so --

Amy 29:51

Great to know. All right. Well, that was our Five Minute Management. Stay tuned for the upcoming Five Minute Managements that are also management of honey pests.

Stump The Chump 30:08

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

Amy 30:23

All right, we've been getting a lot of questions. So, thank you to our listeners. I think our listenership has increased in the past couple of months. So, I'm really happy to see that there have been questions coming into our email. Jamie, I've got three questions for you. And we'll get started.

Jamie 30:39

Let's do this thing. Yeah.

Amy 30:41

All right. Okay, so the first question, there's a little bit of background. This person, it's their first year of keeping bees, they love it, of course, when you keep bees, you love it, most of the time, and then you can't stop reading and learning about them. So, of course, this person is obsessed with bees. They are in the suburb of Philadelphia, they keep hearing about a dearth period that they're going into. And so, the question is essentially asking about feeding bees sugar water. So, the problem really is this person doesn't know when they're supposed to determine whether to feed or not to feed. Their colony has two deep eight frame brood boxes, a deep eight frame honey super and a medium eight frame super that they're drawing out comb on. So, really, the question is, when do we know to feed? When do we know? And how do we know?

Jamie 31:31

And, Amy, this is a really important question, because when you survey beekeepers about some of the significant stressors that honey bees are facing, feeding is always in the top five, well, starvation is in the top five, and so you remedy starvation by feeding bees. So, understanding when to feed bees is incredibly important. And I get this type of question so much because of the background the beekeepers share. Think about what they share. You know, my mentor is telling me I need to watch out, I need to be feeding bees, because we're going into a dearth. I hear that all the time. So, sometimes when you tell new beekeepers that what you'll see is that these new beekeepers will just start feeding and never stop, or they're not sure when to stop, or they're not sure if they should still be feeding and they're not sure what they should be feeding. So, here's my short answer to it. And then I'll explain a little bit beyond that. My short answer is I only feed bees when they need to be fed. I don't feed them because it's a known dearth period, or because it's, you know, something like that. And so, let me let me expand on that idea. My standard hive configuration is a deep box for brood, and a medium super for honey. That's the standard hive configuration that I take through the year. And so a queen will produce about a deep box worth of brood. And bees will need about a medium super's worth of honey to survive throughout the year. That particular questioner uses two eight frame deeps, but, in reality, that's about the same. They're using about a deep for brood and, you know, just over a medium or so for honey. And hive configuration is important because if you are running singles, then you may not have enough room for all the honey that they need to survive throughout the year. And so, for me, it's pretty simple. I like to say colonies need about a medium super's worth of honey in reserve at any given time. So, if I see that in my colony, then I don't feed. There's no need to feed if you're in a dearth if they've got sufficient stores. Now, there is some caveats to that. Caveat number one is maybe you want your colony to grow during the dearth because you want to split it or maybe the dearth is before the major nectar flow and you want them to grow and be strong enough to produce honey. So, in order

to answer this question appropriately, number one, you need to ask, do they have enough food reserves already? Number two, what am I trying to accomplish with these bees? The questioner mentioned we're going into August, and there's noted dearth. Well, are you trying to split colonies in August? Are you wanting to grow them because there's a coming nectar flow in September? You know, if the answer to both of those questions is no, then you would only feed if they're zeroing out in honey reserves. And in this particular question, this case, they have an eight frame deep box and an eight frame deep box with the eight frame deep box that's on top being where the bees are going to store the honey. So, I'd want to see that box about two thirds full of honey, you know, throughout the year. And so, in my particular case, I want that medium super full if I'm going into a dearth in August and I see that I've got about a quarter of that medium super's worth of honey filled with honey. So, I know then that they're going into a dearth, they're going to exhaust what little bit of honey stores that they have left, and so I'll feed them to fill up that medium super. But if that medium super is already full, you know, there's no need to feed them. I don't want them to grow. I'm not going to split them. So, I don't feed them. Another good indicator, you know, besides just having that upper super, or box dedicated to honey, is hoisting the hive. If you go behind the hive, a lot of hives have these handles that are kind of manufactured into the walls of the box. So, if you go behind the hive, and hoist the bottom box from its back handle, kind of rocking it forward with one hand, you know, you're kind of tilting the colony forward, with one hand, you can get a rough index of the weight of that colony, and over time, you'll be able to say, "Oh, gosh, this is super heavy, they've got enough honey, or no, it was incredibly easy for me to hoist this thing, maybe there's a problem." And you can train yourself to recognize that weight. Because in my case, when I have that medium super full of honey, on my standard hive configuration, I can practice hoisting that to know what it feels like to have that honey in a hive. And just kind of one final statement here regarding this is that they won't necessarily always store that honey in the box you designate as their honey. So, in the questioners case, you know, if you've got two eight frame deeps, I would want to see about a medium super's worth of honey distributed throughout those two boxes. So, that will be somewhere around, you know, half of the upper deep with honey and maybe honey stores a little bit around the brood in the lower most box. So it's an art. Feeding bees is an art as much as it is a science but you'll begin to learn to recognize these things if you keep in mind, my bees need about a medium super's worth of honey in their hive throughout the year and if I get below half of that, then I may need to feed if there's an upcoming dearth. Yeah, so that actually goes kind of -- it's related to the next question that we have. So, the second question that we have for the Q&A, so when people do feed their bees sugar syrup and the bees kind of turn that into honey, is that actually honey? And, you know, would you collect it? Is it considered honey? And, I guess, in my case, why would you not just eat the -- drink the sugar water? Drinking the Kool-Aid, right? So, this is an interesting question because when I was learning how to keep bees, my mentor always told me, "Do not feed bees sugar syrup during a nectar flow," and he's like, the principal reason for that is because they might store that sugar syrup in the supers that you want them to make marketable or harvestable honey. The short answer is that sugar syrup stored in cells is not honey. Honey has a very specific definition. And I don't have the exact specific definition memorized but it goes something like this: honey is the product of nectar that bees collect from plants. And they don't even say flowers because sometimes you can -- bees can collect nectar from extra floral nectaries, nectaries that occur outside of flowers. So, bees, so honey is the conversion of that nectar collected from plants into a sugar rich substance. And in the case of sugar

water, that's not what the bees are collecting. You are giving them, you know, granulated sugar dissolved in water, that's sugar syrup, and when they dry it off as they would nectar and when they go through the conversion to honey process, it cannot be honey because it wasn't collected as nectar from plants. And as a result, there are some states and some regulations that say honey cannot be adulterated. If it says honey, it has to be, you know, that particular thing converted from nectar that bees collect from flowers. And as a result, that honey cannot contain sugar water. Now we get into the philosophical issue, then, is it okay for bees? And so, then that all goes back to, well, why do bees have honey in the first place? A lot of people just assume that honey is bee food and they get a lot of nutrients from it. But really, most of what bees get from honey is energy. It is their fuel. They eat that sugar so that they can move. And when they consume sugar delivered to them as sugar syrup, they seem to move just fine and function normally. I know this, you know, this might be setting us up for a little bit of trouble with our listeners. But all the research that I've shown is that bees do just as well on sugar syrup as they would on honey stores, because, again, it's not their food. It's just energy that they're trying to derive from it. So, we feed bees for the purpose of replacing honey that may not be there and bees use it for sugar syrup for energy purposes. Yes, you can technically harvest it. You can technically eat it, but it's not honey, and more often than not, it's counted against you if it shows up in the honey that you extract. Now, I'll throw in one last little bit of comment here just to save us a little bit, Amy, in that honey bees are remarkable organisms, and they're finding every day, all kinds of benefits bees get from certain compounds that are in things that they collect. Rosins, for example, pollens, for example. So, it would not surprise me if there was an ample body of research to suggest that there are compounds in honey that are beneficial to bees beyond simply an energy source. And in that case, they might lose the benefit of that if they're fed exclusively on sugar syrup. But I would say that I've not seen those data overwhelming at the moment, though I wouldn't be surprised if we don't see some of that stuff pop up in the future. Nevertheless, feeding bee sugar syrup, corn syrup, etc, as an energy source is just played out, you know, it's demonstrated its value over and over and over again in the beekeeping industry.

Amy 40:49

Sure, you know, we actually had a friend, his name is Vince, and he came into the bee lab just the other day and brought me some honey. And he had his honey tested at the Texas A&M Lab, which I did not realize that they actually don't do that testing anymore. But, you know, he was able to get this analysis of what his, you know, what was in his honey, and I kind of wonder if he fed his bees and whether sugar syrup came up, you know, on the actual report. So, I'll have to ask him about that.

Jamie 41:17

Awesome. Alright, so the third question is not about feeding bees or sugar water. But this person was asking if we have any information about mixed race bees, and is there such a thing in it? Is it best to avoid mixing the races? And I guess the first thing I kind of think of is, like, breeding dogs, you know? I mean, sometimes you'll get, like, a mutt and you don't really know what it's mixed with. They have like those DNA tests and stuff. But I've heard that dogs live longer when they're mixed. So, what are your thoughts on that, Jamie? Well, Amy, in that particular case, that lab is looking for pollen grains that are present in the honey so that they can theorize, hey, you got a lot of this particular trees' pollen in there,

so, it's probably predominantly, you know, citrus honey, gallberry honey, what have you. But there are labs that are sophisticated enough to be able to say, hey, this isn't derived from nectar, there's actually different things here. And they can say this is 50% sugar syrup. So, it's been a problem. Adulteration in honey is a really big deal to beekeepers in the US and around the world, for that matter. So, that's why we have the recommendation, do not feed bees any sort of sugar while they are producing marketable honey that you plan to extract. Yeah, so I will say a couple things. Let me give a little bit of biography or biology here so that our listeners can appreciate, you know, the questions being asked. Yeah, well, it's actually, the reason I struggled is because it's actually biogeography. But I didn't want to introduce that term, so I said, biography first, and then, which is basically the wrong pronunciation of biogeography. All that aside, we don't have pure races of honey bees in the US. And so, what that means is we know that *Apis mellifera*, this trillion in Europe, the Middle East, and Africa and Western Asia. So, the stocks of bees that we have in the United States were brought over originally with some of the original European settlers and were continued to be introduced until the early 1900s. So, those, a lot of the bees that we have here can trace back genetically, you know, to hundreds of years ago when European settlers came to the US. Those races of bees that would have been brought over as pure races, Italian bees, German bees, things like that, are no longer pure races. So, we don't have races of bees in the US, we have stocks of bees in the US. You can think a lot about them a lot more like cattle. So, there are no races that we're trying to preserve. When someone tells you they're selling you Italian bees, they're basically guessing that they're, well, they're not guessing, but that they are an Italian-derived line. They are not the Italian race. They're a stock of Italian bees. And I know it's semantics. So, maybe it's a little tricky, kind of, to understand and explain, but nevertheless, the real purpose of the stocks is that we want certain traits, you know, Italian-derived stocks tend to produce lots of bees and lots of honey, they tend to be docile. The Russian-derived stocks tend to be tolerant to Varroa, things like that. And so, the reason that's important is it has less to do with mixing races, simply because we don't have races of bees in the US, but more to do with losing whatever traits came with the stock that we wanted in the first place. As an example, maybe I want docile, large colonies, so the Italian-derived stock would be good. But if I bring in another stock that's slightly more defensive, uses more propolis and overwinters in much smaller clusters, maybe I don't like that. And so, maybe I wouldn't want to mix those two stocks because I'm worried about losing whatever traits that I'm interested in. So, it really all boils down to maintaining the stock that has the traits you want.

Amy 42:39

You can give a biography if you want.

Jamie 42:41

Awesome. All right. Well, there we have it. Those are our question and answers. Everything was about wax today. Thank you so much. Don't forget to email us, follow our social media pages and feel free to send us a direct message on any of the social media pages that we have.

Amy 45:29



Hi, everyone, thanks for listening today. We'd like to give an extra special thank you to our podcast coordinator, Megan Winfrey and to our audio engineer James Weaver. Without their hard work, Two Bees in a Podcast would not be possible.

Jamie 45:54

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