

# Episode 6 Mixdown PROOFED

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## SUMMARY KEYWORDS

beekeepers, bees, mites, varroa, colony, bip, bee, hive, alcohol, years, data, commercial beekeepers, sample, brood, nathalie, randy, apiary, talk, program, infestation

## SPEAKERS

Jamie, Cameron, Amy, Guest 3, Guest, Guest 2, Dr. Boncristiani

### Jamie 00:05

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. Welcome to another episode of Two Bees in a Podcast. I'm your host Jamie Ellis accompanied by the Amy Vu.

### Amy 00:51

Amy Vu. That's my name. Sticking to it. Not Zu, not Wu.

### Jamie 00:55

But your name is short though. So it's like "the," and you're like expecting this huge grand name. It's like, "The... Amy Vu."

### Amy 01:02

When I was in high school and college, everyone called me "Vu." And then --

### Jamie 01:07

"Boo hoo?" And they're like, "Why are you crying? It's only a joke." Sorry.

### Amy 01:13

Now they call me Amy and I get all confused because everyone just had called me Vu for so long.

### Jamie 01:18

Well, okay, that's great. I think we need to introduce this podcast Amy, or Vu, or however you want to be known. So listeners, we really do have a great episode for you today. We are joined by Randy Oliver

from Scientific Beekeeping. He will be talking about Varroa loads in colonies, mite washes, the do's and don'ts and the research on what mite washes say about actual Varroa populations in your hive. That is followed by a segment on the Bee Informed Partnership, the benefits to you as beekeepers, what they do for you, etc., and joining to speak on behalf of the Bee Informed Partnership will be Anne Marie Fauvel and Nathalie Steinhauer who are great interviewees on this topic.

**Amy** 01:20

Great, lovely people.

**Jamie** 01:25

Absolutely. So this is a great episode. I mean, we've got three fantastic speakers. And I think you guys are going to really enjoy what we talk about in today's episode of Two Bees in a Podcast. So listeners, have we got a treat for you. In today's podcast, one of the things that we did when we were trying to set up Two Bees in a Podcast is we wanted to know from our listeners who they wanted to have us interview on our podcast. Today's guest is one of those interviewees that lots of beekeepers requested. So we knew that we had to get this individual to join us early on in the series because a lot of beekeepers want to hear him speak. A lot of beekeepers value his knowledge. And of course, Humberto, I'm speaking about none other than Randy Oliver. Randy is a commercial beekeeper from California. He runs a website called ScientificBeekeeping.com. Randy, welcome to Two Bees in a Podcast.

**Guest** 02:20

Thank you guys.

**Jamie** 02:23

Umberto, I tell ya, I'm excited to have Randy on board. What do you think?

**Dr. Boncristiani** 03:05

I'm excited too. I'm a friend of Randy for many years and it's good to have you back here.

**Jamie** 03:12

Well, Randy, we are preparing ourselves to be dazzled so we want you --

**Guest** 03:16

Oh my gosh.

**Jamie** 03:17

No pressure. So let's start this way. Randy, we've spoken to you a little bit behind the scenes before we came on the air, and one of the things that we knew that you wanted to discuss was some work that you're doing with estimating Varroa populations in honey bee colonies. So before we get to that work specifically, Randy, I want to ask you, is it important to even do this in the first place? Should beekeepers estimate Varroa populations? What value is that to the average beekeeper?

**Guest** 03:46

Okay, well, I hesitate to ever use the word "should" when I speak to beekeepers at all. Okay. So it all depends upon what your goal is. If your goal is to follow somebody's teachings of, for example, not ever touching a hive, well, then you wouldn't estimate Varroa populations. If your goal is to keep your bees alive and to keep them healthy, or to make a honey crock or not to have your colonies die, well then, yes, you're going to have to monitor Varroa. We might want to put this in a historical perspective. Back in the 80s, we hear the Varroa mite had not yet arrived in the United States. And we heard that they called it the bee wolf in Europe. And we knew that the bee wolf was likely going to show up and the Europeans were freaking out about it. And I remember our county extension agent would come by every year and test our hives with sticky boards to see if Varroa had showed up in California. In 1993, I saw my first Varroa mite in one of my hives, and at that point, I had bred bees for many years. I had bees that could eat American foulbrood and eliminate it from the hive and bees that were resistant to the tracheal mite after the tracheal mite had wiped most of our hives out. I had these very, very tough bees that could handle anything, and I thought, "Oh man, Varroa, no big deal. Bring it on." And man, oh man, I was not ready. Varroa wiped out close to 100% of my hives. It was really, really rough.

**Jamie** 05:25

Yeah, Varroa are definitely like the scourge of the beekeeping industry. I mean, even today, they're a big issue. It's funny, you're talking about seeing him, I think, the first time in 1993. Well, here we are in 2020. And we're still talking about Varroa. We've made very, in my opinion, not so much, quote, significant progress on this thing.

**Guest** 05:42

I think it's ridiculous how little we've done, and that's a different subject... [inaudible] reading and working with Bob Danka and the USDA. Yeah, the answer is selective breeding. But what happened, then, is after, I almost gave up on beekeeping back then, after losing most all my colonies. Then, another beekeeper friend said, "Randy, there's this magical little plastic miticide strips you can put inside your hives." We put those inside the hives and it was just like a miracle. You keep bees again. And there was one of the extension agents that said, "You know what? Varroa was the best thing that ever happened to beekeepers because what it did is it wiped out all the competing, or to commercial beekeepers, it wiped out all the competing hives living in the wild, the feral colonies, and wiped out all the hobby beekeepers who weren't managing their colonies. And things were better for those remaining beekeepers because they could control the mite with this strip. Now, here's the interesting thing. We could get by with one treatment a year, you could let the mites just build up in your colony all year long, and then come fall, you could have almost maybe a mite on every single bee in the hive, and that hive, the bees would still be thriving. And you put in these strips and mites just fell by the tens of thousands. Your sticky board at the bottom of the hive would be solid, reddish-brown, covered with mites. The colony said, "Great!" and survived the winter and it was no problem. So that once-a-year treatment could do it. The point is that, initially, colonies could handle a very, very high load of Varroa and still survive. And this didn't just happen in the United States. This happened in every country where Varroa showed up. When you had the first invasion of Varroa, it was not that big a deal if once a year you could treat. And then what we saw before our eyes, as a biologist, is I can watch the virus, deforming virus, evolve. And after a couple of years, we can no longer get by with that once-a-year treatment. Our threshold for treatment, the number of mites that the colony could handle, mites transmit this deformed wing virus, that number dropped lower and lower. You couldn't let a colony go that long. So then we

started looking at this concept of treatment thresholds. A number of them came out of the southeast of how many mites you have in a hive.

**Jamie 08:05**

I think, Randy, that's an important point. Right? Because prior to this issue, when the threshold is what you're saying, going down, down down, beekeepers could do exactly what you said. You treat once a year, you treat twice a year with Apistan, fluvalinate, and that was the deal but now it seems necessary to monitor Varroa populations. We have to know when we reach those thresholds.

**Guest 08:27**

So yeah, that's the critical thing. And what we've seen is these threshold numbers changing and changing as the viruses evolve and better take advantage of Varroa as a vector within the hive.

**Dr. Boncristiani 08:41**

Randy, I have a question for you. So what are the ways someone can monitor Varroa population, in your opinion right now? What are the types of procedures they can do?

**Guest 08:52**

Okay, the first one that comes to people's minds is just to look for mites. So they pull the frame out of the hive, they look on the bees and they see if they see mites crawling around. I was in New Zealand a number of years ago and talking to the managers of the large operators there. They put one manager in charge of every one thousand hives and they have a crew of a few guys that would run the hive. So I spoke to several managers and I asked them how they did that. And they said, "Oh, we just wait to see mites crawling on the bees." And I said, "Well enjoy that while it lasts."

**Jamie 09:24**

Yeah, that just means your bees are about to die.

**Guest 09:26**

The virus will evolve in your country also, and you will not be able to do it any part. Sure enough, in a couple of years that did not work anymore. The point is that Varroa mites prefer to feed on the bees on the undersides of the bees. The Varroa mite rarely ever has to touch the comb, if ever in its life. It hitchhikes on the bees. So by the time you actually visually see mites walking on the combs, you have a very high infestation rate, and that's the problem with many hobby beekeepers because they don't ever see a mite, they don't think that there's mites in the colonies. So visual assessment does not work well. So the second thing to do would be to do a brood assessment, where you go in, you either look at the drone brood or worker brood, and either when you open your hive during the spring when they're rearing drone brood between the frames, you inadvertently rip open cells of drone brood that are on the top bars, you can look for mites in that drone brood, or you can put in a drone trap frame and use a capping scratcher to pull the cappings off and knock the brood out and count for the mites in there.

**Jamie 10:35**

But Randy, like what you say, when you're looking visually on the adult bees and visually even on drone brood, all you're doing is seeing mites, it doesn't really tell you a mites to bee ratio or a level of

infestation, right? These are just visual things. And oftentimes, by the time you see these levels that are high, it's too late, right?

**Guest 10:56**

Well, yeah, high, but what you do is you look for even a lower level. You just do it when you see, yes, you do see mites at all. With those assessments, generally, you'll see no mites until the level starts to climb, then you'll see some. The problem is it's extremely variable, and other researchers and myself, when we've actually tried to quantify that, we find that day-to-day or week-to-week, the percentage that are in the brood, or any sample of 100 cells or so varies too much. So it's not a reliable method. So then the other one that is an in-hive, whole colony method would be natural mite fall, putting a sticky board underneath the colony and counting how many mites just fall from natural attrition or from the bees happening to bite them. Most of that drop appears to be from natural attrition. About half of that natural mite fall is from mites that are just coming out of the cell, newly emerged mites, and trying to get their bearings, or the founder's mite, the original mother who is spent now after being in that cell for 12 days, and you get a very high attrition as mites first come out. So the natural mite fall is very much dependent upon how many bees are emerging from cells during that period of time. And what I've collected data on this in colonies day after day, I find it can vary by a factor of three. We get 10 mites one day, you get 30 mites the next day, and you're down to down to 10 or 20 the next day. So that's also variable. Plus, you need to also see how many frames of bees are inside the hives. So if you get 20 mites falling from a colony with 20 frames covered with bees, that's very different than 20 mites falling from a hive with only 4 frames of bees. So you have to open the hive and assess your colony's strength. So for that reason, there are times when sticky board counts are very useful scientifically. But as far as mite assessment, I find them to be time-consuming. And unless done properly, can be misleading.

**Jamie 13:06**

Randy, you hit the nail on the head because we use them a lot in scientific research. And as you noted, we have to leave them in multiple days and take an average mite fall because of how variable it is. But secondarily, if you don't know the bee population or the brood population, it's not a particularly useful count because you're absolutely right. If you've got 60 mites on a sticky screen in a colony of 5000 bees, that's way different than 60 mites on a sticky screen in a colony of 20,000 bees. And so it's difficult to know much unless you know the actual colony population so that you can correlate the two.

**Guest 13:37**

Right. So then you can also do a forced mite fall with a sticky board. And what you do is you put your sticky board in, but instead of just waiting for 24-48 hours for the mites to fall -- if you wait more than 48 hours anyway, you have so much hive trash that it's very difficult to count the mites -- but you can do that and then put in something that accelerates the drop. So powdered sugar dusting will cause about a third of the mites that are in the bees to drop in about an hour or so. You can use formic acid. Some beekeepers use one of the synthetic miticides, something that accelerates that drop. And now that's actually a fairly good assessment because it assesses the whole colony population. But again, it takes some interpretation and you have to know the strength of your colony. That's whole colony assessments. Now, we can start looking at sampling a bee sample assessment, which is a whole new ballpark then.

**Jamie 14:37**

Yeah, so what are some of the ways that you prefer to do that? I mean, to me, the most popular method is some variation of the alcohol wash where you collect a sample of bees, about 300 bees or so in a jar, and you wash them with alcohol. I mean, there's variations of that. There's the ether roll, there's powdered sugar shake, but they're all kind of relying on the same principle. I mean, what do you do? I know you've looked specifically at alcohol washing, so maybe we should go there.

**Guest 15:00**

Okay, well, let's put things into perspective. So the first one that was popular was the ether roll where you take a sample of half a cup of bees, put it in the jar, put in a squirt of automobile starting fluid ether that stuns the bees, if you save them quick, you might be able to save them, and you roll it around. The exposure to ether causes the bees to disgorge any nectar in their crops that makes the outside of the jar sticky, and it also causes the mites to release the irritation of the ether. And that's the key thing. You have to have the mites release from the bees in order to see them. And then you roll that jar and then the mites stick to the sides of the jar, and that is fairly indicative of the mite infestation rate. It is still widely used. But a more accurate method, then, is to use something like detergent water or alcohol in order to remove the mites from the bees. And then we come up with different methods of sieves and filters and shaking and agitation to remove them. The gold standard among scientists is the alcohol wash, where you take a measured number of bees, typically level half cup, which is about 315 bees, and put them into a container with alcohol. And then you, depending upon who's recommending it, you shake them hard or you stir them or you agitate them, then let the mites release and try to separate them from the bees by various methods, and then count the number of mites off of there, that came off the bees.

**Jamie 16:44**

And you're trying to generate a mites per 100 bees ratio or something like that?

**Guest 16:48**

That's what you're looking for. Scientists use mites per 100 bee ratio, which involves arithmetic. Many beekeepers just use mites per half cup of bees, which does not involve arithmetic. That's just simply what you actually see. And since the half cup of bees is pretty standardized, I like to just use the mites per half cup of bees. When I'm talking to scientists such as yourself, then I'll do the arithmetic in my head, which is always an extra step then. I try to avoid extra needless steps. Every time you do arithmetic, that makes it a little bit tougher. What we find --

**Jamie 17:22**

Yeah, math is hard, right?

**Guest 17:27**

Here's the huge assumption -- we can get back to this -- Assuming that those 300 bees that you took from that sample of the hive are representative of the mite infestation rate of the bees throughout the hive, and that's a huge assumption and we'll talk about that, then you can look at what percent infestation rate, how many mites there are per 100 bees. So one mite per 100 bees would be a 1%

infestation rate. And what I've seen in our operation is if we can keep our colonies at less than a 2% infestation rate, two mites per 100 bees, that'd be roughly six mites in an alcohol wash, the bees do just fine as far as viruses. Remember, it's not Varroa that kills your colony. It's the viruses they transmit. Just like we have with other livestock, you have a critical level of infected individuals in a population that will allow a disease pathogen to spread/transmit throughout the population. At only 2% infestation rate of mites, the deforming virus does not transmit well throughout the hive.

**Dr. Boncristiani** 18:32

Hey, Randy, Umberto here. I've been following your work and I know you're trying to develop systems to eliminate some of the assumptions that we have regarding complication of mites. Can you tell us a little bit of what are you doing? There's so many variables when you're doing alcohol washes and assumptions and I know you have some good information that you can share with us.

**Guest** 18:53

Certainly. The number one problem I see across the United States with beekeepers is they wait too late. A very low level of mites, 1% or a half a percent infestation early in the season seems very low but that means that colony is not going to make it till the end of the season. The problem most beekeepers have, they wait too late until the mite level is fairly high and then they try to bring it down. By that point, the virus epidemic has already started. So the key to successful bee management is to keep the mite level low throughout the season. If we use the adult bee sampling method, the alcohol wash or the powdered sugar roll, the question is what time of year? Online, you can just Google "Randy's Varroa model" and come up with a spreadsheet, which shows you, at any time of the year, if you look at your alcohol wash level, what that predicts your mite level will be two months, three months in the future so you don't get caught off guard. Okay. So now once you decide that you're going to take these, then you're going to open your hive and you're going to take a sample of bees. The question is what frame from the hive to take them from? The Varroa mite prefers to ride on a nurse bee. The nurse bee has more fat bodies, it's more nutritious to the mite. And the nurse bee is the only bee in the hive that will take that mite to a cell that has a larva about to pupate, and that's the key thing for Varroa. They have to catch a ride to larva that needs to pupate. So the highest mite infestation rate will be on the nurse bees. So the question then is which bees in the hive to sample? Yes, if you sample pure nurse bees, then you're gonna get your highest infestation rate in the hive. But that doesn't necessarily mean that's a representative sample because if the colony has a small amount of brood and very few nurses, they're gonna give you a misleading sample. So maybe what you want is a sample of bees that gives you a more representative sample of the bees in the hive. So I'm going to be publishing some data from an experiment I completed recently where I went through a number of hives and took out the frames one at a time, and took an adult bee sample from each of the frames, and then quantified the mite level there and then recorded what was on that frame, whether it was a honey frame or a drawn comb or bee bread or mixed brood or simply young larvae, whether it had the queen, and the results were very interesting. I could then figure out what your average mite infestation rate was for all the frames in the hive. And what I'm looking really for is, and again, it depends on what your goal is, if you want to be conservative, you would want to see what the infestation rate was of the nurse bees. If you want to have a better idea maybe for the whole colony, you want to look at what frames will give you the most representative sample of all the bees in the hive. And I'm not sure right now which one is the right one now that I have this actual information.

**Jamie 21:55**

Randy, you just stole my question. I was basically going to say, "So what's the answer?" So the answer is I don't know? You sound like a scientist.

**Guest 22:04**

Typically, you get your highest Varroa infestation rate from combs that have young larvae, open brood.

**Jamie 22:10**

Makes sense. Makes sense.

**Guest 22:10**

Combs with mixed brood are high but a little bit lower on average than the ones with young larvae. And then you look at your honey combs and your combs of bee bread. They are lower, but they're actually more consistent than the other combs. The other combs with brood, that number can jump up and down in the same colony, the infestation rate quite a bit from frame to frame on the brood. This is something Dr. Rock Buechler from Germany, years ago, we corresponded about this and we had done some work saying, "Well, if you look at the combs that have honey or bee bread on them, you get a lower infestation rate but it's a more consistent infestation rate than the ones that have brood." I can tell you right now the short answer. The bee sample that is most representative of the mind infestation rate across the hive is from a comb with honey or bee bread onto it adjacent to the brood nest but not actually [inaudible.] This has another very, very practical benefit. When you go to the hive to take that bee sample, if you go to the brood nest, you're gonna get the highest mite infestation rate but you also have a chance of inadvertently getting the queen in your bee sample or using detergent or alcohol or ether or shaking the heck out of them with the sugar shake, you're likely to damage or kill the queen.

**Jamie 23:33**

Yeah, the rumor is the queens don't like that. Yeah.

**Guest 23:36**

So by avoiding taking brood frames, you're not only getting a more representative sample but you have much less chance of getting the queen in the tub. And I'm going to return to the queen issue in a second. So a comb adjacent to brood but not with actually brood on it will give you a most representative sample.

**Jamie 23:56**

Let me ask you a quick question. We've been saying non-stop, alcohol washes, alcohol washes, alcohol washes, and usually, the scientist Jamie thinks of one type of alcohol and the homeowner Jamie thinks about another type of alcohol. What the scientists thinks, ethanol, because that's what we put our bees into. But at home, I'll only have access, easily, to isopropyl. That's rubbing alcohol, right? So what type of alcohol should beekeepers use? And does it matter? Should they be getting rubbing alcohol? Should they go get some southern comfort and try to get it at a high enough concentration to pickle those bees?



**Guest 24:33**

Well, that's a good question. I don't have hard data on the difference between ethanol and isopropyl alcohol. My educated guess is they're likely the same. The real question is your percentage of alcohol. When you go out to buy isopropyl alcohol, if you go to the dollar store, you can get 50% isopropyl alcohol, you can get 70% isopropyl alcohol, you can get 90% isopropyl alcohol, you can get 99% isopropyl alcohol. There are four different grades that are commonly available on the shelf. For many years, we would use a low percentage, 50%, because it was the cheapest that we had. So I was curious whether that made a difference. And I ran dozens and dozens and dozens of alcohol washes with different concentrations from bees from the same colony, and then would do multiple washes, take the same sample and agitate them over and over again until I finally recovered all the mites. What I found out was with 50% isopropyl alcohol, you might have to do four or five washes on the same sample of bees for 60-second washes. In order to recover all the mites, the mites did not release very well in the 50% alcohol. If you do 90% alcohol, virtually, you get 95% or more mites released in the first one minute of washing and you get 100% by the second minute of washing. Then there's two things in play right here. Number one is how quickly the mites sink. When you're doing that agitation, I use nested cups so my mites precipitate down. I never shake up and down. If you shake up and down, you wash the mites back up into the bees every shake. So shaking up and down is counterproductive. Your best thing is to precipitate the mites to the bees by a swirling method or using your fingers in a sieve. So the question is, well, do mites sink at a different rate in those different alcohols? And the answer is yes, they sink almost twice as fast in 90% alcohol as they do in 50% alcohol.

**Jamie 26:37**

That makes sense, buoyancy issues and different density.

**Guest 26:39**

So we drop mites one at a time in two different solutions. And with a ruler and a stopwatch, measure how quickly they sink. They sink twice as fast in the higher proof alcohol.

**Jamie 26:50**

Incidentally, the same is true for Umberto. He sinks twice as fast in the higher proof alcohol.

**Dr. Boncristiani 26:56**

That's true.

**Guest 26:57**

The second question is how much agitation is necessary? Now, first thing beekeepers want to do, they just want to shake the heck out of it. They think "Oh wow, this will knock those mites loose." Well, I tested that one by taking a cup with bees and a screen bottom and then just placing it for 10 seconds into different concentrations of alcohol and then moving to the next cup at the same concentration for 10 seconds, and then 10 seconds at the next and did that for several cups in a row. So I figured out how quickly they drop. In the higher proof alcohol at 20 seconds, they just start letting go. It was zero agitation.

**Jamie 27:36**

High alcohol, you don't even need to shake them.

**Guest 27:38**

90% alcohol, within a minute you've got most all the mites have just released with no agitation whatsoever. Okay, by two minutes, essentially, they've all released. That doesn't happen with the lower proof alcohols, they don't necessarily release. So there are assumptions of, one, that you have to shake them, that's not a valid assumption, that was just an assumption. You don't have to actually ever shake. If you just use a high enough proof alcohol, the mites release of their own accord. You just jiggle the bees slightly and bingo. Don't take my word for this. Take take a kitchen sieve, put it into a white tub of 90 proof alcohol, dump the bees in there and just look underneath and within 60 seconds, you're gonna see virtually all the mites drop out of there of their own accord with no agitation whatsoever. Then you just give those bees the slightest little jiggle so that any mites that have bounced on top of bees, they will drop down and you get 95% recovery with no agitation whatsoever. So now we're fine-tuning this. The problem is on the alcohol wash, shaking the bees up and down, it's counterproductive. What you want to do is a method of swirling so the mites can just drop. Now, I live in the California Gold Country where we learn to pan for gold, and it's the same exact thing. You have gold nuggets or gold flakes which have a higher density than the gravel. You don't want to shake the gold up and down in the gravel because it'll never come out of the gravel.

**Jamie 29:08**

Let me ask you a question. If you live in Gold Country, why are you a beekeeper?

**Guest 29:14**

It takes a lot of agitation. But miners back in the 1850s, they got all the good stuff.

**Jamie 29:19**

All right. That makes sense.

**Guest 29:21**

It's tougher to get. So what we do when you're panning for gold, you're doing a slight agitation side to side just to disturb the gravel grains and that allows the gold to precipitate down to the gravel and fall to the bottom of the pan. It's the same exact mechanism with alcohol wash. Your best bet is to do it with agitation, I use a circular agitation so that the mites can just drop. They release of their own accord and they drop quickly to the bottom. So with the right agitation and the right alcohol, in 60 seconds you can get 95%+ of the mites released consistently.

**Jamie 29:57**

Alright, so Randy, here's the million-dollar question. We have talked with you for 30 minutes about alcohol washes and mite sampling and the importance of that. You've done a lot of research and shared it all with me. I want a 30-second soundbite of a summary of what you recommend now with alcohol washes, based on your research. You collect it here, this many bees, you shake, you stir, you use this amount of alcohol, you do this, give us the summary statement from all of your research on alcohol washes.

**Guest 30:29**

What you do is you want to start early in the spring. Your mite counts, at that point, should be zero mites to maybe one mite in a half cup of bees. If you have more than one mite in a half cup of bees in spring, get on your mites right then. Okay, so you do first your springtime wash. Now, realize most of the mites at that time are hidden in the brood. So the alcohol wash will underestimate the mite infestation rate of the whole colony, the mite population of the colony. So in June, do it again, depending upon how much brood. Typically, there's a lot of brood, so, again, a lot of the mites will be in the brood. So if you get a 1% in June, three mites in an alcohol wash, be concerned. I would treat right then. We will treat without hesitation at that point. Again, you're taking your sample from a frame of bees adjacent to the brood nest. And then you can look at my mite model and extrapolate how far you can go until you have to do your next one. If we control mites in June, we typically have until August. We cannot wait till September or October in our California or your Florida environment because the mites will be increasing too quickly. So use the alcohol wash, it's a predictive value. You want to have that very low number, which means, "Oh, I got some breathing time. I can wait two months until the next treatment." On the other hand, if you're up at that six mites in an alcohol wash, you cannot wait two months because they're going to increase too quickly, especially as the amount of brood rearing decreases later in the summer.

**Jamie 31:57**

Randy, that was absolutely great information. Thank you so much for sharing and spending some time with us. I think beekeepers need to monitor for Varroa. I liked the fact that you outlined what an important infestation rate to know is. We appreciate all the research that you're doing to help us make our alcohol washes better, perhaps more accurate, and just for spending time with us, Randy. Thank you so much.

**Guest 32:18**

You bet.

**Jamie 32:19**

Yeah, ladies and gentlemen, that was Randy Oliver, a commercial beekeeper from California who runs a website, [ScientificBeekeeping.com](http://ScientificBeekeeping.com). Thanks, Randy, for joining us on Two Bees in a Podcast.

**Cameron 32:30**

For additional resources, visit the podcast page on our website, [UFhoneybee.com](http://UFhoneybee.com).

**Jamie 32:35**

Hello listeners, and welcome back to Two Bees in a Podcast. I am incredibly excited about this segment. Amy, I travel a lot and almost always when I'm giving presentations to beekeepers about bee colony losses and what's killing bees, etc., I always default to data that's collected and published by the Bee Informed Partnership. Now, you cannot be a beekeeper in the United States, for that matter, almost in the world, and not know who the Bee Informed Partnership is and what they do. I happen to really respect the organization. Everyone I've met from the Bee Informed Partnership, amazing individuals, amazing team. They do a lot of really good work for beekeepers. And I'm not just saying that. I believe it to the point that I use their resources and recite their data when I'm places.

**Amy** 33:28

And, in part of this segment, we'll probably ask some questions and answers because we did have at least one question, or a couple of them from our followers when we reported that we were going to be speaking with BIP. So we're pretty excited for that.

**Jamie** 33:40

Absolutely. So without further ado, we've got a segment here where we've actually been fortunate enough to bring in two individuals from the Bee Informed Partnership. The first of those is Anne Marie Fauvel who is the Technical Transfer Team Coordinator. And we're also joined by Nathalie Steinhauer who is the Research Coordinator for the Bee Informed Partnership. Anne Marie and Nathalie, thank you for joining us, and welcome to Two Bees in a Pod.

**Guest 2** 34:05

Thank you for having us, Jamie.

**Jamie** 34:06

Absolutely. Ann, I'm gonna start with you because you and I share the stage at the Wisconsin Honey Producers Association meeting where we both spoke and I'll tell you, I just kind of hung on every word you said. When I left, you gave a talk over the technical transfer teams. But more importantly, kind of to me, the take-home message that I had was a Sentinel Apiary project. So I want to talk about all that with you. But first, I just want to start by asking you what is it that you do? What is the Technical Transfer Team Coordinator? And even backing up from that, what is the Bee Informed Partnership? And why do beekeepers need to know about it?

**Guest 2** 34:40

All right, well, let's start from the beginning. Yes. Thank you for your introduction. It was interesting to follow you at the Wisconsin meeting because you are a lot funnier than I am.

**Jamie** 34:50

Amy, you heard that, right? You heard that I'm funny?

**Amy** 34:53

He just thinks he's funny.

**Guest 2** 34:57

Well, in the end, I was a little intimidated. But I'm happy to hear that you enjoyed what I had to say. The Bee Informed Partnership is such a great team, such a wonderful family. It's a nonprofit organization, and as its name implies, it's a collaboration between honey bee research labs and academic institutions across the US and beekeepers and the beekeeping industry. So basically, we tried to bring everybody to the table, all the stakeholders to the table, to discuss and try to solve some of our issues. So in the end, the beekeepers of the Bee Informed Partnership have a mission to reduce colony mortality and to improve our understanding of colony health. And we tried to do that by bridging the gap between research and industry.

**Jamie 35:46**

Yeah, that's so great. You do such a good job with that, for sure. Yeah.

**Guest 2 35:50**

Yeah, thank you. Well, it's a big mission, that's for sure. And bringing all these people to the table has been extremely interesting to hear all the voices and to be able to work from all these different perspectives and angles. One of our programs, the Technical Transfer Team Program, and that's what I coordinate, we have six honey bee health specialists working in five different regions in the US. And basically, they travel with the commercial beekeepers and their bees to provide them with services. And those services include inspection, diagnosing data collection, reporting, and consulting with beekeepers, hopefully reporting the state of their colonies in a data-driven manner so that they can make decisions in real-time, informed decisions from the data we produce for them. So these Technical Transfer Teams, they are working with beekeepers in California. We have a Pacific Northwest region, which is basically covering Oregon, Washington, Idaho, and Montana. We have a Midwest region that consists of mainly Minnesota and North Dakota. And then we go slightly more east to Wisconsin and Michigan and New York, which travel all the way down to Georgia and Florida. And then we have another team in Texas, which basically covers Texas and South Dakota, all of the central US.

**Jamie 37:16**

Well, Anne Marie, let me ask you a question about that. You've mentioned a lot of states and I think the service that the Technical Transfer Teams provide is really good. I think this is a really good model for beekeepers really around the world if similar organizations would come into existence to provide a service. Let me ask how many colonies, roughly, are represented by the Technical Team? Because I know you guys focus on the larger commercial beekeepers. So even if it's not, say, zillions of beekeepers, it's a mess load of colonies. So how many colonies are represented by the tech team?

**Guest 2 37:45**

Yeah, so we serve, as an approximate, a little over 100 commercial beekeepers, currently. 110 I believe. These commercial beekeepers represent about 17% or close to 20% of the number of colonies in the US.

**Jamie 38:01**

That's incredible. What a service. Yeah. And I think one of the beauties about it, there's no doubt that -- I mean I know that part of what BIP does is maintain anonymity so we're not going to talk about who those beekeepers are -- but one of the things I appreciate is, I'm guessing, since that number of beekeepers are representing that number of colonies, my guess is that a lot of these are industry leaders. And probably what happens in their operations, with their interactions with BIP has a trickle down effect to other beekeepers who are collaborators or colleagues with them. So while only 17% may be represented, my guess is that much greater percentage of bee colonies are impacted by the efforts of BIP based on the beekeepers who are involved in the program.

**Guest 2 38:41**

Well, we certainly hope so. And I think Nathalie can also talk a little bit more about some of the impact of the Technical Transfer Team across the US, some of the numbers or data that we have.

**Jamie 38:52**

Nathalie, let me actually say this to you now that we're kind of segueing into you. The first time I ever heard about you was not because I was at a BIP meeting but because a former individual used to be in my lab, Mark Dykes who I believe is with BIP now. He had just gotten back from a meeting. He's like, "Jamie, have you ever met Nathalie before?" I said, I don't think I had at the time. Mark was like, "Wow, she's like really clever and makes all this stuff at BIP work and she's the statistician that does all this stuff. You really need to meet her." He was incredibly impressed, and I know that he's now part of the BIP family. So Nathalie, you've been in it from almost the beginning. So what is your involvement, how did it start? What do you do to make this big old machine run?

**Guest 3 39:36**

Well, thank you so much for that. Actually yeah, I was part of the Bee Informed Partnership for a long time because I actually did my PhD work with Dennis at the University of Maryland, so I've been around the team for close to eight years now. But the Bee Informed Partnership itself started in 2011 as a five-year CAP grant from the USDA NIFA. And so it was written to develop a national colony loss survey, to start the Technical Transfer Team, to work with commercial beekeeper and specifically, with honey bee queen breeders in California, and after four years, they became this 501(c)(3) nonprofit organization. From there, we grew the annual survey every year. And now, we include not only colony loss, but also management and treatment information. And so the objective is to try to find the best management practices that are associated with reduction in colony loss. We also expanded the work of Technical Transfer Team as Anne Marie was mentioning, five regions in the United States assisting commercial beekeepers in 17 states. So that also grew over the years. And then most recently, I guess, the development of the Sentinel Apiary Program to monitor the health of colonies from hobby beekeepers and bee groups across the nation. And as a side project, I guess, we're also managing the Apis national survey for USDA, we help create that with the University of Maryland, offering diagnostic and emergency test kits for beekeepers that request those services. And we're also trying to partner more with new collaborators across the US and Europe. We're trying to perform field trials on demand and really help to bridge that gap, researcher to science and beekeepers and trying to be that bridge between the science industry and the beekeeping industry.

**Amy 41:53**

Yeah, so Nathalie, I know you all are very active as far as communicating what you're doing and the different tools that you're using, I receive your emails pretty often. And Jamie and I were actually at a conference not too long ago, and we were talking to some beekeepers here, and that was actually one of the questions that we had on social media. Can you tell us a little bit more about the Sentinel Apiary Program and what that is, and how beekeepers can really become involved? I know there are a lot of beekeepers out there that want to help and they're just not quite sure what direction to go in?

**Guest 3 42:26**

Yes, we were very excited about this program because, for a long time, we worked with commercial beekeepers and we're like, "How can we also service smaller scale beekeepers that we can send the

tech team in person, take the samples, and do all that consulting with small-scale beekeepers?" But what we basically found is we can help them to monitor their colonies. And so basically what we do is any beekeepers, and we usually say if you have a minimum of four hives you can participate in our programs, and what we'll do is we'll send you all the equipment you need to take samples in your own colonies and basically incentivize you to take a sample, hoping you'll do an inspection, take a sample once a month for the whole active season, usually from May to October with a little wiggle room on that timeline. And so it's really this incentive program to get those scale beekeepers to go into their colony, giving them the right tools to learn how to inspect their colonies and getting used to do monitoring and look at their data. And then they receive their results in a timely fashion so that they can take decision about their management before the next month about whether or not they should treat or do any other kind of remedy action. They can actually see the disease loads change in their colonies according to their action over time.

**Jamie 44:00**

Yeah, I think that's great. So, Anne Marie, kind of keeping with that, the thing that really stuck with me about your talk at the Wisconsin Honey Producers Association dealt specifically with the Sentinel Apiary Project. What I was incredibly impressed with was your personal story of how, prior to monitoring Varroa in your own colonies, you thought you knew what was going on, prior to monitoring things. When you became yourself involved with this particular project, you saw how quickly you Varroa rebounded, etc. So, what I left that meeting convinced of is that every time I speak to a local bee club that I thought that it's important to endorse this program to local bee clubs. So while maybe not every hobbyist can purchase colonies or pay the fees to be involved in the Sentinel project, I do believe it would be a fantastic teaching tool at the local club level just to show people look, if you monitor your Varroa look at what these populations are doing, if you monitor this, look what's going on. So could you talk a little bit about that, Anne Marie, because I have spoken at one local club in Florida since your talk, and I left there saying, "You guys need to get a club membership in this particular program." And I firmly believe every local club needs to be involved in this project because I think it would teach its members so much.

**Guest 2 45:27**

Yeah, thank you, Jamie. It's really interesting because I myself, personally, way before I even worked with them, I've been in this position with BIP for two years now. I've been participating in the Sentinel Program for four years now. So really, the Sentinel Program is what sold me to BIP, and then I liked it so much that I went and worked with them. But I started with the Sentinel Apiary myself, and it was really part of my bee journey. It made me a better beekeeper. Not that I'm a good beekeeper now, but it did make me a better beekeeper. Number one, because it focused my attention to look for the right things month after month after month. It's really easy in the season, and I'm sure a lot of the listeners will sympathize with me here, it's easy throughout the season to just go in and say, "Oh, well, I don't want to disturb them too much. They're making honey right now. So I'm just going to put a box on." And then you really don't know what's going on. And in my journey with the Sentinel Apiary, I noticed that my Varroa, of course, as the population is shown everywhere keeps growing throughout the summer, and then I started realizing, well, maybe this summer, I can do something else, maybe if I do something ahead of time, like earlier on, maybe I will see a difference in the fall. So I've been playing around with that. But with the data that BIP sends me every month, I'm really able to make a lot better decisions.

What I found really interesting in the last few years is that I transitioned my Sentinel Apiary Program to be our local club Sentinel Apiary Program. And I use the data to start my meeting every month. So when I am involved with the coordination of the local club, and so I come up to the meeting and I say, "All right, let's look at our Sentinel data this month. And let's talk about what we need to do about this." So that gives you a lot of information about, what do we do when Nosema loads are high in the spring? We can talk about this. It gives you an avenue to educate the club and to have these discussions and decide, what's the best way to deal with some of these things? So in the fall, for example, again, all the treatment options, we get to talk about that. And then we talk about, how did we get to such crazy numbers? And then you treat for example, something happened to me this summer. I treated twice, I treated early and then I treated again during honey production, I put some formic acid on my colonies, and then I came back thinking I was going to have the best September ever. And it turns out that if I wasn't in the Sentinel Apiary Program, I probably would not even have sampled thinking I was safe. In the end, I sampled and I had incredible, incredible numbers of Varroa, more than I had ever had before. So this really saved my colonies in the end. So the price of the colonies or the loss of these colonies, I was able to kind of really work pretty hard at keeping my Varroa low after that. This program really has helped me and made me because I realized that if I didn't have to send my samples in every month, I may not do it. So it trains the people to actually monitor and then it gives them a tool to discuss and figure out actions to take in their own colony.

**Jamie 48:41**

Anne Marie, I absolutely could not agree more. What I would say, if you are an officer or even a member of a local bee club and you are listening to this podcast, you need to look into the Bee Informed Partnership, the BIP Sentinel Apiary project. Anne Marie, I think exactly the way you said it is exactly the way it would work great. And most local bee clubs keep a bee club apiary. All they have to do is meet 30 minutes before their monthly scheduled meeting. They can take their samples, package them together, send them off, and then during the meeting, talk about last month's result. I think exactly what you noted is what makes it a powerful education tool. I mean, I've been using exactly, and I've been excited about this while I talk, but exactly what you noted, this idea that, "Oh, I treated. I'm safe. Life is good." I firmly believe beekeepers under-address Varroa. And it's often because they don't sample appropriately, they don't treat appropriately. And I think, at the club level, they could see these data coming in with their own eyes. I'd be convinced that they would then further go to their apiaries and know that they have to change their practices. And that's why even if a beekeeper is unable to participate on an individual level, if it can just be done at the club level, I think it will have such a tremendous impact. I mean, what do you think about that?

**Amy 49:56**

Yeah, I think that's great. I think it definitely gives incentive. It's like going to work out, right? I mean, it's hard to work out by yourself. But if you have something motivating you or someone motivating you to do that, you're probably more likely going to do that. Right?

**Jamie 50:10**

You always find a way to make fun of me, right? Because I'm not big and buff, that you had to use that example.



**Amy 50:17**

Oh, my goodness. Anne Marie, you're talking specifically right now about the Sentinel program. But can you talk a little bit more about specific examples of the BIP impacts that you've had? We've kind of talked about backyard hobbyist beekeepers, but can you talk about some of the impacts that you all have had on a greater scale?

**Guest 2 50:39**

Yes. So, if you don't mind, I'm going to give that to Nathalie to answer.

**Guest 3 50:47**

That's fine.

**Guest 2 50:48**

Natalie is the one that crunches all these numbers, and she's the one that produces all these amazing graphs that we can then go out and say, "Look how much impact we have!" So I don't want to steal her thunder. She really does all that hard work, and we need more of her in the eye. So I'm gonna let her take that

**Amy 51:05**

Great.

**Guest 3 51:07**

Okay, well, yeah, I mean, we like to say that we are data-driven, I guess, and I'm responsible for the data crunching. So there are a couple of ways that we like to see that we're getting to our goal, which, again, is to improve honey bee health and reducing colony loss in the end for participating beekeepers. So, we've been working on different programs that are targeted to different types of beekeepers. And so one of them, for example, is we've been working with queen breeders for a couple of years. And so those commercial beekeepers will actually perform with us, we will perform for them hygienic testing. And based on those results, they can decide, then, which colonies to use for breeding. We go into the colonies, we basically are able to tell them what colony has the best cleaning rate, and from them, they can select those colonies and hopefully, improve their stock. And so what we have seen over the years is that those beekeepers that have been part of the program for multiple years, we actually see clear trend line that their overall hygienic scores have improved over time. So this is one way that we think we are helping those breeders take better decisions. And then hopefully, that will trickle down to all of the people that purchase those queens and improve the stock of the hygienic behavior in bees overall. Another way that we're seeing some impact is, so those commercial beekeepers that are part of our program, some of them take our annual loss and management survey. And then when we compare those commercial beekeepers that are part of our program with the loss rates reported by other commercial beekeepers, we actually find that the commercial beekeepers part of our programs report lower level of losses over the winter, which is the end goal, right? Well, that's that's the final objective. And that's one of the metrics that we can measure to see an impact. So we said that we're sometimes pushy, and that's kind of one of our best qualities is that we can force beekeepers to disrupt their habits, we go and take samples when they say themselves that they're too busy and that they can't monitor on their own. And so that means that we can help them to catch problems early on, and we

give them time to react to them. And so we think that that's the reason why, overall, we might help them be more successful.

**Jamie 53:51**

Well, Nathalie, let me expand some questions on that because one of the ways that I use BIP, essentially, all the time, is by the use of the colony loss data, and I know that you're the mastermind behind crunching those numbers. So the two things that I use, probably every one of my talks are the data related to colony losses, like what percentage of our bees are we losing every year, and if I'm not mistaken, that hovers kind of in between 35 and 40% a year when you look at summer and winter losses composite. And in addition, what I really, really, really like is when you guys ask beekeepers, what do they believe are their principal reasons for their colony losses? Now, the reason I like those data so much is because those data are what helped me shape my own research program, right? If beekeepers are not saying that small hive beetle are in their top five reasons for colony losses, then why would I be investing mass loads of research and energy in studying small hive beetle? So, over the years, I've averaged together all the data and I've used those results to kind of shape what we do here. So I've talked about loss rates, I believe, if I'm not mistaken, hovering around 40%. But let me ask you, what do the BIP data collectively say are the principal reasons that beekeepers are reporting for their losses? In other words, what are the big stressors that beekeepers think are responsible for the loss of their colonies? I know that varies a little bit from hobbyist to commercial, but if you could kind of give me the overall picture, and then zoom into commercial because I also have a take on that based on looking at the data, but I'm gonna let you talk about it since you're the mastermind behind it.

**Guest 3 55:32**

Yeah, so that's a very interesting question, indeed. And we like to portray it as a way of saying this is not to say those are actual colony losses. Those are the way that the beekeepers see it.

**Jamie 55:46**

That is their perceived colony losses.

**Guest 3 55:49**

Yeah, that's the perceived colony loss. And what we usually find is that one of the major difference between small-scale and large-scale beekeepers is that if you ask large-scale beekeepers, commercial and some of the sideliners, their number one, without a doubt, cause of colony loss is Varroa. And then they will also actually report issues, but really, really far above anything else is Varroa. And then when you look at small-scale beekeepers, then Varroa does not have this really central component. It's in the top five, but it's not all the way up here like it is for commercial beekeepers. And we think that it's not because Varroa is not a problem for small-scale beekeepers, it's because there is way less belief that it is.

**Jamie 56:43**

Exactly.

**Guest 3 56:43**

[inaudible] The way that it's actually recognized in commercial applications. And what we also find is maybe that's a reflection of uncertainty for the beekeepers, but small-scale beekeepers tend to maybe pick causes that are a little less precise, like, "Oh, my colony was weak in the fall," or, "It might have been the winter weather was not adequate." Or, like we have some some of those maybe more vague causes of death rather than associating with a specific cause.

**Jamie 57:25**

Yeah, I think that's great. And one of the ways that I think that the data, like I said, I cannot stress this enough, the way that the data have really helped me and my team is we try to cater our research programs to what we're seeing beekeepers report. When I've crunched the numbers over the years, and you've both probably see me give these talks, in the top five most-reported, it appears, in no particular order, to be Varroa, nutrition, bad weather, weak in fall, and queen-related issues. For various reasons, I usually take out weak in fall and weather, which leaves what I call the big three, which is Varroa, nutrition, and queen issues. And if I'm not mistaken, when you excise the commercial beekeeper results, you often get pesticides mentioned in the top five, usually, when I look at the commercial beekeeper responses. So long story short, as a result, we try hard to focus on Varroa because that's what we all believe is killing bees, nutrition, queen-related issues, and to a lesser extent, maybe some pesticide stuff. So I think BIP, gosh, BIP data are the data that make that kind of honing in possible. And I hope that that serves as a model for other people. We need to be addressing what the beekeepers say is important to them. I think BIP is great at allowing us to think about that. So let me just see if I can get this right because BIP offers so many services. I want to make sure and recognize all of them. We talked about quite a few and I made a list, and you guys tell me if I'm wrong. Number one, you work with queen producers. I love that idea because you can work with thousands and thousands of beekeepers or you can work with a few queen producers who influence the colonies of thousands and thousands of beekeepers. So I love the fact that you're doing queen or stock improvement programs. You have tech teams that work directly with commercial beekeepers who provide monitoring services and all kinds of information related to their apiary so they can make real-time decisions. You've got the Sentinel Apiary project, which is a fantastic teaching and monitoring tool, especially for smaller-scale beekeepers. I think the educational component is just an amazing part of that particular program. You guys manage the USDA National Survey. And fifth, I've got here, you guys conduct your own loss surveys, which produces all of these corresponding data on what management practices are related to these loss rates, etc. You give management tools to beekeepers, etc. So I've hit those five things, right? Queens, tech team, Sentinel Apiary, loss surveys, and the USDA National Survey. Am I missing anything else that BIP does for beekeepers?

**Guest 2 1:00:05**

Well, we're involved with doing trials for the industry, which also Nathalie can report on, as she has been really instrumental in setting up all of the experimental design protocols for all of these studies. And then, of course, it's a signal analysis at the end of that. So we provide this, we're kind of like a one stop shop, because we have access to a large number of colonies in the real world, in multiple regions. And so we can actually do a lot of these trials for the beekeeping industry, for beekeepers, for anybody who has a scientific question to answer. We have the power to be able to do those. So that's one thing that we do. We also provide emergency diagnostic kits as well as emergency response kits and

diagnostic kits. So those are two different things. So those are some of the other programs I can think of. Nathalie, you want to expand on that?

**Guest 3** 1:01:02

Yeah, sure. I mean, the reason that we started working more with those trials is that we found that a lot of our beekeepers said, "Well, all of the programs are great, but we have small questions like, what is the effectiveness of a product in the real world rather than in the lab. We know the efficacy of a product in the lab, but we want to see it in the real world, we want to test it ourselves." So we have beekeepers that actually started doing their mini-trial at their local scale. And we said, "Well, we can probably coordinate that and make it a more coordinated effort throughout participating beekeepers, and actually collect data that others replicated on a larger scale." So now we have worked on a different couple of projects, and we've worked with universities, and as Marie said, the industry, and the idea is that we can be this independent third party that coordinates the effort of collecting information from the beekeepers, most of the time, directly working with our tech team, which are really trained professionals that will always take metrics from a colony inspection in a rigorous way, and get really concrete data on how all of management and treatment products work in real conditions rather than in lab.

**Jamie** 1:02:29

Yeah, I think that's great. We've had a lot of industry partners try to come to us and scale up some of the things they do. I know you guys do that on a large scale. In addition to offering all those things that you've just mentioned, I see that people everywhere at every meeting, tabling booths, etc. So you're out there with the beekeepers in their colonies, in their mailboxes by sending back reports, online, you guys are everywhere. And I think you guys are a powerful force of good data and for exacting change in our industry. So I really applaud what you guys do.

**Amy** 1:03:02

So we probably could talk about this way longer than we have in just 30 minutes we've been here. But Nathalie, can you tell us where participants want to -- listeners want to know more? Where should they go? What should they do?

**Guest 3** 1:03:15

Yeah, they should definitely go on our website. So [www.BeeInformed.org](http://www.BeeInformed.org). It's a brand new website, we're really proud of it. And they will have direct access to our research folder as well where they can actually see the data with their own eyes. So they can browse the data of all of the different projects, they can see the disease loads, on average, by state from the different programs that we're doing. And then, they can follow us on Instagram and Facebook, sign up for our blog, so that they can see some of the pieces that are written by some of our employees, some of our tech teams, and some of our supporters that are written on a regular basis. So just go on our database and browse it for yourself, and you can find answers to many questions by all the questions that you can explore for yourself.

**Guest 2** 1:04:16

Thank you so much for having us, Amy and Jamie. It was wonderful to chat about our programs. Thank you.

**Jamie** 1:04:16

Guys, I give a talk a lot, it's called Resources for Beekeepers, and it's not even a PowerPoint presentation. I require my hosts to ensure Internet access when I give that talk because rather than give a PowerPoint presentation, I literally bring up the web and say, "Here's how I find the resources that I'm about to tell you about." The Bee Informed Partnership and the Honey Bee Health Coalition, among others, you guys are always the ones who make my list. I show people how to get to your website, I show people how to navigate your website, I show people how to use information from your website. So we work a lot here at the University of Florida to endorse you guys and your resources and I'm so grateful for you mentioning that. I want to say it again to our listeners, it's [www.BeeInformed.org](http://www.BeeInformed.org). You should go to that website and spend a lot of time at that website looking up information. In my opinion, the Bee Informed Partnership has something to offer every beekeeper, great or small in the United States. And for that matter, there's information relevant to beekeepers around the world. Anne Marie Fauvel, Technical Transfer Team Coordinator for the Bee Informed Partnership and Nathalie Steinhauer, Research Coordinator for the Bee Informed Partnership, we thank you from the bottom of our hearts for joining us here today on Two Bees in a Pod. Absolutely. Welcome back, it's time for questions with Jamie. And Vu. Amy Vu.

**Guest 2** 1:05:38

Dad gummit, Amy, you had a chance to rhyme. Questions with Jamie and Amy.

**Amy** 1:05:52

Do it again!

**Jamie** 1:05:56

Welcome back. It's time for questions with Jamie --

**Amy** 1:05:59

and Amy.

**Jamie** 1:06:00

Vuuuuuuu. Get it? There's people booing you right now.

**Amy** 1:06:03

Oh, yeah. Is that what that is? The crowd booing me? Thank you.

**Jamie** 1:06:06

Alright, we need to get to the Q&A. Otherwise, people are gonna cut us off and say this is nonsense. So Amy, we had a question come in about Home Owners Associations.

**Amy** 1:06:16

Dun dun dun.

**Jamie** 1:06:17

Dun dun dun. So we're gonna make people even more mad than we would with a discussion on pesticides. Alright, so let's think about this. Here's the background. Backyard beekeeping is increasing. People are wanting to keep bees, especially in suburbia. And people find themselves torn because they want to keep bees, they live in a subdivision that has a HOA, or homeowners association, and that HOA may say, "You can't keep bees." So what do you have to do, Vu? Oh, my goodness, your name, it just rhymes. This is great. Can't wait. What do you do, Vu?

**Amy** 1:06:49

I mean, you basically just become the president and change all the rules.

**Jamie** 1:06:52

Oh, that's an easy answer.

**Amy** 1:06:54

Yeah, well, I mean, there are lots of different options that you can do. I've rented places that have been part of HOAs. I've also owned homes that are not part of HOAs. But I've also worked a lot with HOAs. The short answer is that it might be easiest to find a friend who might be able to let you keep bees on their property. And that will depend, again, based on your HOA, based on the people you work with, and your community. I mean, I am part of an HOA but we have goats in our neighborhood. I said goats weird.

**Jamie** 1:07:24

Can you keep bees there? Bees with your goats?

**Amy** 1:07:26

Yeah, I can keep bees there. The neighbors are cool with it. If you're in an area that, again, your HOA may or may not say anything about honey bees, you might want to ask the President or the board just to see if they're okay with it, and maybe provide education somehow. Contact a local extension office or contact your local beekeeper and maybe you can provide education.

**Jamie** 1:07:27

Ok, cool. So there are two recommendations then. Number one is try to work with your HOA, make them aware of the situation, and see if you can change their mind if there are rules against it. Number two, if you fail to change their mind, phone a friend, because you likely know someone who has some property who would be more than happy to allow you to keep bees on that property.

**Amy** 1:08:07

And the thing you should always do is share your honey.

**Jamie** 1:08:09

That's right. Honey is really good at persuading people to see things your way.

**Amy** 1:08:13

Yeah. So that's a short answer. Alright, so the next question we have. People will buy packages and nucs and some people will buy them online. So what do you recommend as far as buying bees online? Is that okay?

**Jamie 1:08:26**

Yeah. It is okay, right? We live in the digital age, a lot of the bee package and nuc providers sell and advertise online. I think that's good. I mean, of course, there's this idea of buying local, but, I'm a capitalist, right? Buying local is good if it's reasonably cheap, number one, and number two, the bees are good. Of course, you support should support local beekeepers. But you also want to make sure the bees that you're getting are good and robust. And for a lot of people, the opportunity to buy local doesn't exist. Maybe you live in an area where packaged bees or nuc providers don't exist. So yes, certainly check out the local scene, make sure that there are local resources available to you. If there aren't, then feel free to purchase those bees online.

**Amy 1:09:05**

Yeah, can I tell you what we did when we first started beekeeping in Virginia?

**Jamie 1:09:08**

I bet I can't stop you.

**Amy 1:09:09**

Okay, well, I'm gonna tell you anyway. So we bought one nuc from a local beekeeper, and then we bought a package from Georgia. And we were living in Virginia at the time.

**Jamie 1:09:17**

Go Dawgs.

**Amy 1:09:18**

And we just wanted to we just wanted to compare the two, honestly. And so we tried both. I mean, why not? You can kind of compare and contrast and see what happens. I just know that the mail carrier was not too happy about it when they had a package and it was buzzing. They had no idea what it was.

**Jamie 1:09:32**

Sure.

**Amy 1:09:32**

But that's my recommendation.

**Jamie 1:09:34**

Yeah, I mean, at the end of the day, just because someone's local doesn't mean it's a source of bees that you need to be purchasing. So you just do your homework on your local. When possible, buy local, but if not possible, then it's certainly doable to purchase your bees online. They'll come to you in the mail. A lot of post offices are used to receiving bees and know how to handle that. You can always call

your local post office to give them a heads up and say hey, "I've got a package of bees or a queen coming your way. Call me when it gets there and I'll come pick them up." That's a good thing to do.

**Amy** 1:10:00

They're not gonna think you're weird or anything.

**Jamie** 1:10:02

Of course not. Bee people are not weird.

**Amy** 1:10:05

You said something about research. So we're kind of on a beginner track right now with our questions. And so the question that we have is, how much should I research and read and attend workshops versus how much is just learning and problem solving as you go? Because that's a great way to learn, right? From your mistakes?

**Jamie** 1:10:21

I mean, there's obviously no substitute for getting your hands dirty with bee colonies. But to me, the best way to learn is through a mentorship program. And so let me explain that. Before I kept bees, I read a lot about them because I was interested in bees at age eight, and my parents wouldn't get me bees. It took about four years to get bees.

**Amy** 1:10:38

You could read at the age of eight?

**Jamie** 1:10:39

Yeah. Heck, yeah, I was writing books at the age of eight, Amy. You should see some of my eight-year-old books, little scary, but happy to be moved past that part of my life. But I read a lot about bees. As a result, I knew the jargon associated with beekeeping, I understood it, and then I had a mentor when I was 12. He taught me how to keep bees the way that he kept bees. I learned a lot. Unfortunately, when I was 13, or 14, I forget, he passed away so that it was just me and the bees. I had enough background knowledge through reading, enough background knowledge through my mentor to be able to go out on my own alone, there's really no question though. I learned most by having and trying to keep bees alive. And then I was reintroduced to another mentor when I went off to University of Georgia. I worked in a bee lab there and Keith Delaplane, the bee scientist there, taught me about keeping bees on a large-scale and bee research. So, you learn multiple ways. You can read, you can have a mentor, you can learn by experience, and I really think it takes all of those to produce the best beekeepers. So no one way will do it. I think it really takes being submerged in multiple ways to maximize what you're doing with your bees.

**Amy** 1:11:46

Sure. And that's probably one of my favorite things about bees is that you can just learn so much. I mean, you are constantly learning about them.

**Jamie** 1:11:53



Yeah, if you think about the way they used to do it in Europe, the apprenticeship program, this idea that you have to apprentice under someone who will then teach you and then you roll out from there, it just really adds credibility to that idea of mentor and the value of mentors, that you can either do on your own or through your local bee club or state bee club.

**Amy** 1:12:11

Awesome. Thanks. Those are all the questions and answers for the segment.

**Jamie** 1:12:15

Yeah, thanks for joining us for Two Bees in a Podcast.

**Amy** 1:12:21

We'd like to give an extra special thank you to the following: to our editors Shelby Hal and Bailey Carol, and to our audio engineer James Weaver. Without their hard work, Two Bees in a Podcast would not be possible. So thank you.

**Jamie** 1:12:36

For more information and additional resources for today's episode, don't forget to visit the UF/IFAS Honey Bee Research Extension Laboratory's website [ufhoneybee.com](http://ufhoneybee.com) Do you have questions you want answered on air? If so, email them to [honeybee@ifas.ufl.edu](mailto:honeybee@ifas.ufl.edu) or message us on Twitter, Instagram or Facebook @UFhoneybeelab. While there don't forget to follow us. Thank you for listening to Two Bees in a Podcast!