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SPEAKERS

Amy, Guest 2, Jamie, Guest, Guest 3

Jamie 00:05

Welcome to Two Bees in a Podcast brought to you by the Honey Bee Research and 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. We've got an exciting episode of Two Bees in a Podcast for you today. In the very first segment, we're going to be talking with two individuals who represent the Florida Farm Bureau. We're speaking in general about what Farm Bureau does for beekeepers. So that includes Jason Mathis, who works for the Florida Farm Bureau as well as Tony Hogg who's a beekeeper here in Florida who's on the Florida Farm Bureau Apiary Advisory Committee, and we're going to talk about Farm Bureau: what it does for beekeepers, and how groups like it around the world can be advocates and lobbyists on behalf of bees and beekeeping. We're going to follow that with a segment on the interface between mosquito control and beekeepers. Here at the University of Florida Honey Bee Research and Extension Lab, we get a lot of questions about the potential impact of mosquito control on bee colonies. And so here to demystify that with us today is Caitlin Gill, who is from the Florida Department of Agriculture and Consumer Services. And of course, we're going to end today's podcast with everybody's favorite segment, Stump the Chump. So there are many different agencies out there that exist to help beekeepers and one of those agencies in Florida and United States in general is the Farm Bureau in Florida, there's a Florida branch called the Florida Farm Bureau. Well, in this segment of Two Bees in a Podcast, we're actually going to be talking with two individuals who have lots of information about the role of the Florida Farm Bureau, the Farm Bureau in general and what the Farm Bureau does for beekeepers in the US. And for those listeners who are outside the US, don't panic, I am certain that there are similar organizations for you as well. So hopefully, listening to this interview with these two gentlemen will get your wheels spinning as you think about what agencies might provide similar services for you in respective areas. So to begin this



conversation we're going to be discussing today, this issue with Jason Mathis, who's the Assistant Director of Ag Policy for the Florida Farm Bureau. We're also joined by Tony Hogg who's the Chair of the Florida Farm Bureau Apiary Advisory Committee. He's also the former president of the Florida State Beekeepers Association. And he's a beekeeper in Florida who kind of straddles the line between sideline and commercial beekeeping. So we've got two great guests, Jason and Tony. Thank you guys for joining us so much today.

Guest 02:55

Appreciate it, thank you for having us.

Guest 2 02:57

Thank you for inviting us.

Jamie 02:58

Amy, I know you've got the first question.

Amy 03:01

I do! The first question's mine. So I was just wondering if you guys could tell us what Farm Bureau is. Is it the Farm Bureau or is it Farm Bureau? Is there a "the" at the beginning?

Guest 03:13

It's not like "THE" Ohio State, we just leave it at Farm Bureau.

Jamie 03:16

You're gonna use Ohio State as the university example, Jason?

Guest 03:22

Well, we don't say "the" Florida Gators. We say Florida Gators, you know, we know we don't need to put a "the" in front of it.

Amy 03:31

So what is Farm Bureau?

Guest 03:33

Jamie gave a good lead in there that we are Florida Farm Bureau. We are part of American Farm Bureau. So if you're in the United States, there's a Farm Bureau within your state. As an example for us, Florida Farm Bureau was our state's largest agricultural organization. We have more than 142,000 members, and within our state, within the 67 counties in our state, we have 60 County Farm Bureaus that make up the grassroot structure for our organization. And very similar to all of the other states that have county Farm Bureaus we advocate for farmers and ranchers in those states in our state, at the local state and national level for farm owners who produce for us all of our 300 state agricultural

commodities. And that's regardless of the scope of their operations or their location. And our main mission through advocacy is to increase the net profit of those producers.

Jamie 04:36

So that's interesting to me, Jason, because "farm," that is really a huge, all-encompassing term. Obviously, we're on Two Bees in a Podcast, we're talking about it from the beekeeper perspective, but you just mentioned a few hundred ag commodities. So what are the types of things? What are the types of producers? What are the types of cropping system or livestock systems that you guys support?

Guest 05:00

We are a general ag organization. So a lot of the times we do have people that come to us that really want us to advocate for a specific commodity. And we try to make sure that we always have general ag in our thoughts. And I'm sure it's the same in a lot of states, they have, let's say, a peanut association, a cotton association that advocates specifically for that commodity. And what we try to do is we try to make sure that our policies that we're advocating for are general enough so that it touches on all of the commodities in the state, if it's a BMP program, or best management practices, that we're making sure that we're advocating that that's going to be a usable practice for people that are specific to that industry. And so we try to make sure that everything that we're doing is general enough to help everybody, to lift everybody up within agriculture.

Jamie 06:01

I think that's an important comment. If you think about it, I guess there are times where ag interests between two different groups could actually be contrary to one another. So if you're representing two ag groups, I'm going to just use bees and row crops as an example, where in the past people have been quite concerned about the impacts of pesticides on bees, but on the other hand, you're representing both groups or you're trying to make the needs of both groups known and addressed. It can be a struggle, sometimes, if you've got what looks like competing interest between two commodities.

Guest 06:37

Yeah, absolutely. And that's something that we see a lot. Well, we have great relationships with a lot of different organizations and associations. And they will give us a call and let us know that there's a specific item that they want us to work on. And a good example is we have specific policy on invasive plants, let's say, and a lot of our producers say a lot of people in livestock, a lot of the guys in the cattlemen association would like to see the removal of Brazilian pepper, or some other invasive plant species. Well, our beekeepers, that is a primary forage for our beekeepers. So there's a real Catch 22 there, that we're trying to make sure that we're working with both, that there is adequate forage for beekeepers, but then we also understand the need to have that controlled for different property owners. So it's a it's a tight road balance.

Jamie 07:45



So Jason, that's a really good overview of the Florida Farm Bureau [and] Farm Bureau in general. I just, I'm curious, you said you're the Assistant Director of ag policy. So what is your role in the Florida Farm Bureau?

Guest 07:57

So within ag policy, within our division, I specifically work on helping to develop programs and policies that will help our farmers and ranchers prosper. We also work on protecting domestic food production, and on best management practices that protect our natural resources. A lot of the ways that we do this are through partnerships with other agencies and associations. But we also rely heavily on our advisory committees to help guide our advocacy efforts. And these advisory committees play a very important role in the policy development process. The committee members are experts in their commodity or in their area of expertise. And they really help our staff stay up to date on the pending needs within the ag community.

Amy 08:49

So Jason, you talked a little bit about how Farm Bureau and how you guys do assist producers. And it seems like you're kind of like the middle person in between. And I think that's really great and important, because you guys are facilitating conversations and bringing different areas together. But how else does the Farm Bureau assist producers around the state?

Guest 09:10

Sure, and I touched on it a second ago. I think our advisory committee plays a critical role for us. They're comprised of industry experts. And when we put the committee together, much like they do in other states, this is the same kind of system that they use in other states. We put the committee together with the thought of trying to have a diversity of producers across the state. And then we add technical advisors that can, help us out. Diversity is very important when we look at adding members to the committee. We want a group that can give input on issues from North Florida to South Florida. So regional diversity is something that's very important. And we also want a good mixture of the size or the scale, that they're working on, their products, and experience. We've got Tony, who's up in North Florida, and we've got guys that are down in South Florida and the issues that they're facing can be completely different. So having that good diversity within our group can really help us kind of shape what's going on throughout the entire state, and how we're able to help them. We also are in the business of like you said, Amy, disseminating information. And here in Florida, we're used to hurricanes. So a lot of what we could be sending out could be disaster relief programs. We also get from different industries, from different agencies, industry specific news. And then with our connections with our local university, with University of Florida, we get emerging technology or research that's coming out that will be helpful to people within the industry. So basically, any topic that's related to the industry that they may not be receiving, and they might not have had that relationship with a specific agency, we're trying to make sure that they get that. Tony may be able to even highlight a little bit more what he sees with our advisory committees, and then how we kind of work on getting that information out.

Jamie 11:18

Yeah. Jason, I think that's a great segue into interviewing Tony. In fact, Tony, you're joining us as the chair, as the beekeeper chair of the Florida Farm Bureau Apiary Advisory Committee. Jason mentioned that there's similar structure for other states, for Farm Bureau, where they go into their own state's beekeeper advisory committees. But you represent the Florida Beekeepers to the Florida Farm Bureau. There's a committee that you chair, there's meetings that you have, could you tell us a little bit about that and how you beekeepers make your voices known to the Florida Farm Bureau, as well as you work with Farm Bureau in general to make sure that your needs are addressed at the state or national level.

Amy 11:56

It's a good point. And first of all, I'm a member of the Florida Farm Bureau. But the advisory committees that they meet together, we bring beekeepers from around the state together. And as Jason said, a lot of times we have different issues because we have different crops or different sources that we're pollinating. So we sometimes look at the beekeeping issues in slightly different glasses. So we come together, we discuss policy, we discuss the general needs of beekeepers, then we make the recommendations to Farm Bureau. This should be included as a Farm Bureau policy. The advisory committees meet twice a year. One specifically for the apiary advisory, then there's a larger meeting of all the advisory committees. And as the chair of the Apiary Advisory Committee, I've also had the honor of serving on the Farm Bureau Oversight Committee, where we discussed general farm policy and we make recommendations to the Farm Bureau of what we believe a general policy to cover all aspects of agriculture should be.

Guest 13:17

If I could add one thing on that real quick. And Tony mentioned it, these policies that come in from our specific different commodities, and I think we've got 16, we've got 13 general commodity advisory committees, and then we have some issue-based, like labor would be one specific example. When we get these policies, we're talking a lot about Florida and policies that are specific to Florida. If we have one that is general enough to cover everybody within the United States we send that to American Farm Bureau and American Farm Bureau, they look at it and they say this works for a lot of different states here, then they'll add that to their policy. And it'll be something that they advocate for everybody within the AFBF structure. So it's not only just specific to Florida, a lot of it is, but then when they get to a certain level, or if it's a policy that's really going to affect a lot of people, we forward that along. And then everybody that's underneath the American Farm Bureau umbrella gets the benefit of those policies that we send out.

Amy 14:25

Yeah, that's great. How many people are on the advisory committees?

Guest 14:29

They vary from committee to committee. I would say that I think our Apiculture Advisory Committee has about eight and then we've got two technical advisors. But then we have some really big ones like our livestock and cattle. Scott Eubanks handles that for us. And I think they've got upwards of about 20 or

22 people that are on that committee. So they vary, but we still try to maintain that diversity and make sure that we've got the state covered from top to bottom.

Jamie 15:04

So I've been interacting with the Florida Farm Bureau Apiary Advisory Committee for some time since I've been down in Florida. I've had the privilege of being able to work with you guys. And one of the things I've seen, Tony is I've seen a lot of accomplishments, with the beekeepers working together with the Farm Bureau to accomplish a lot of the issues they've set forth in policy. I'm wondering if you can give some specific examples that you have worked with Florida Farm Bureau on, to address on behalf of Beekeepers in the state of Florida, and the reason I'm asking you this question is I want beekeepers around the US and around the world to know what is possible if they work together with similar agencies where they are, what is possible to achieve on behalf of beekeepers. So can you talk about some of the things that you guys have worked together on policy?

Amy 15:04

Sure, cool.

Guest 2 15:51

I think when you work with an agency the size of Farm Bureau, with the reach of Farm Bureau, you certainly can leverage your influence tremendously. Right off the top of my head, and probably the most important thing, in recent memory, the Florida Farm Bureau was a very strong supporter, when the Florida State Beekeepers Association was working to get funding to build a bee lab down in Gainesville. I don't think we would have accomplished that without having Farm Bureau at our back. But it's very important that beekeeping generally is a fairly small segment of agriculture and an important segment, but small segment of agriculture. By beekeepers being members of the Farm Bureau collectively, then we were able to utilize the strength and influence that they bring to the legislature and other regulatory bodies for the benefit of all beekeepers.

Amy 16:57

And I just have to let listeners know, we did not tell Tony to say that.

Jamie 17:02

I do think that's a great example. What you said is perfect is this idea that Farm Bureau is so respected in legislative circles around the US and the respective states that oftentimes if an ag group goes to their respective state legislators saying, this is a big deal for me, that group, those legislators will then go to their State Farm Bureau and say, hey, are you behind this? Do you support this or not? And the support or lack thereof from Farm Bureau can make a big difference. So they are great partners, because they are so respected at the state and at the federal level in the US. I think your point about the bee lab is a great example. If you don't have their support, we worry that we won't get the lab, but then we did have their support, both lobbying and financially. They supported the sponsorship of one of the rooms. So that really made it possible. I really liked the way that you kind of wrap that together and point out the



fact that the legislators really value the input from the Farm Bureau because they have their fingers in all the ag commodities around the state and nation and know what their growers are thinking.

Amy 18:10

Where can we go for more information on Farm Bureau?

Guest 18:14

So you can go to Farm Bureau, it's floridafarmbureau.org and our website is up to date on different ways that you can be involved with Farm Bureau, different programs that we're involved in, we try to keep a lot of information on there about recent news, things that are going on. So we've got an update with COVID, and all of the different resources that are available through that specific link. So you can find a lot of good information on that site.

Amy 18:50

Great. And we'll put that in our additional resources on our website as well.

Guest 2 18:54

One thing I'd like to add to that: a lot of beekeepers, small scale farm producers, have a misconception sometimes that Farm Bureau really represents large corporate farms. Farm Bureau represents all farmers, Florida farmers. More importantly, it represents a rural way of life that so [many] of us enjoy. So membership is truly a good way to find a lot of information and a good way to support making sure that your farms, no matter what the size of them, or your rural way of life is protected.

Jamie 19:44

Great comments, Tony, I agree. We'll have information on our additional notes and resources about membership. What I would tell beekeepers out there is consider being a member of the Farm Bureau in general wherever you live, in our case, Florida specifically. I would also recommend that you try to figure out who your Apiary Advisory Committee is for your local or state Farm Bureau so that you can make sure as beekeepers that you get your needs to their ears so they can think about policy development on your behalf. And I just want to thank Jason Mathis, the Assistant Director of ag policy for the Florida Farm Bureau, and Tony Hogg, who's the Chair of the Florida Farm Bureau Apiary Advisory Committee for joining us today on Two Bees in a Podcast and sharing with us about the role that Farm Bureau plays in general. But of course here in Florida, Florida Farm Bureau plays on behalf of beekeepers here in the state, but also across the country. Thank you guys for joining us.

Guest 20:35

Thanks very much.

Amy 20:36

Thank you. For more information about this podcast, check out our website at UFhoneybee.com. In this segment of our podcast we are going to be talking about mosquitoes. I don't know about you all, but here in Florida, we have a lot of mosquitoes, and we have a lot of mosquito issues that happen here.

So we wanted to talk about mosquitoes and what does that have to do with beekeeping? So today we brought in the expert, Caitlin Gill, who is an Environmental Specialist III. She is the Mosquito Control Support Specialist for the Florida Department of Agriculture and Consumer Services, Division of Agricultural Environmental Services. Try to say that 10 times in a row! She's also a beekeeper, and she's been a beekeeper for almost 10 years. I am personal friends with Caitlin, and she loves beekeepers, she loves honey bees, and she loves mosquitoes, which is a really weird combination. But we're just gonna start with the basics. Caitlin, can you tell us what a mosquito is? What's a mosquito? What's the deal with mosquitoes and beekeepers?

Guest 3 21:55

Yeah, absolutely. So let's talk a little bit about mosquito. I mean, mosquito is an insect, right, like honey bees. They do have three parts of their body. They are six legged, so definitely insects. They also have a holometabolis development, which is just a fancy word for complete metamorphosis. But the real reason why we want to talk about mosquitoes is because they bite and seek our blood and can transfer us illnesses. So mosquitoes are really important to talk about because we are concerned about our public health with mosquitoes being present in our environment. One of the things I think is important to mention, for everyone who doesn't know, female mosquitoes are the ones we are worried about the most they are the ones doing most of the work just like honey bees.

Jamie 22:43

That's not a surprise that they're the ones out biting people.

Guest 3 22:46

Okay, they're actually taking their life in their hands.

Jamie 22:48

Always causing the problems. I'm joking, of course, for the podcast.

Guest 3 22:52

It goes hand in hand. So they're the ones who we're actually concerned about, illnesses or viruses being transmitted the females are the ones you're hearing that are buzzing in your ear. That's a female. And the reason why she takes a bite and takes blood is for her egg production. It increases her egg production by giving her some protein. So it's really important for mosquitoes in order to continue their lifecycle as insects. But the reason why we want to talk about it is because of the importance of protecting our public health and protecting yourself. So mosquitoes are really important. We have over 80 mosquito species in Florida, about 176 throughout the country. And we really have to be concerned because of how mosquitoes can spread illnesses. We have endemic viruses such as West Nile, Eastern Equine Encephalitis, sometimes called Triple E, St. Louis Encephalitis, just to name a couple. Those are here in our environment every year no matter what. And then we also have exotic viruses like Zika, Dengue, Chikungunya that you hear about seasonally. So we really have to protect ourselves. And the reason why we want to control mosquitoes in the environment is to prevent illnesses from being contracted to our humans as well as our pets. People forget about that. Horses can contract

West Nile and Eastern Equine Encephalitis. And there's 16 mosquito species who can transmit dog heartworm. So that's why it's so important to give your pets preventatives for dog heartworm, because mosquitoes are responsible for that transmission. So that's some of the reasons why we really got to be dealing with these mosquitoes in our environment and protecting ourselves.

Amy 24:34

I was about to say, so what does that have to do with beekeepers?

Guest 3 24:38

Well, the reason why it has to do with beekeepers is we want to make sure that we're talking to them because we have to control these mosquitoes. So we're basically having to do certain things that maybe beekeepers are unaware of or not understanding the science. So they go through integrated pest management just like beekeepers do for Varroa mites and hive beetles. I hope. Going through and doing different types of control. And one of the controls that mosquito control inevitably has to use, typically, almost always, as a last resort is a chemical control. So that's one of the things why we want to talk to beekeepers, because we want them to understand what mosquito control is doing, how they're doing their best to control mosquitoes on so many different levels, in order to not have to use chemicals until it's absolutely necessary in order to protect public health.

Jamie 25:27

So I think those are good answers. Let me tell you, I'm from Georgia. So when I first moved to Florida, there was something that someone told me he's like, the only reason people can live in Florida is because of air conditioning, and mosquito control. And that's a saying, I've heard by lots of people ever since being in the state, this idea that it's hot and muggy down here, so the AC helps you out. And then there's a bajillion mosquitoes down here, so mosquito control helps you out. But I travel all over the world. And I tell you, Caitlin, some of the places that I've been where you know that there's high mosquito counts, and that you know that there's lots of mosquito borne illnesses and the mosquito populations. And you get anxious. One of the worst things, I tell you, when you're lying in bed at nighttime in a remote village, and you hear that little [bzz] in your ear, and you just wake up and have to find it. All night long you're battling dozens and dozens that are coming through the windows and under the door.

Amy 26:22

I'm just imagining you with like a mosquito net around you, every time you travel, you just bring a mosquito net.

Jamie 26:27

It's funny, Amy, I've had so many mosquitoes in my hotel rooms before that I've given up the fight and just slept under the covers trying to protect myself. And I've been to some places that the mosquito borne illnesses are so bad that once you get back on the plane to leave, they'll bring in a pest control individual who will fog the plane while you're in it. That was a very new experience for me. I won't tell you where I was, but I'll tell you it happened. So to help Caitlin frame this issue, mosquitoes are not just

an annoyance. They're not just here biting us, they actually can transmit diseases, both to us, to our pets, to our livestock, etc. But on the other hand, we have beekeepers. We have these beekeepers who are keeping colonies, and you just mentioned, eloquently so, that oftentimes mosquito control is necessary to make sure that public health and animal health is maintained. And you'd mentioned as a last resort, oftentimes, you guys have to default to chemical control. So I want to explore this a little bit more. What is the recent history of mosquito control, because here in Florida, in the US, we, especially in Florida, where mosquitoes are just a problem, we have an advanced way of handling them, but so many countries around the world don't. They don't have access to the same safer chemicals that we have, or they have much more mosquito problems. So tell me why, ultimately, mosquito control exists, it's important to think you've touched on it a little bit already. But I want to hear it kind of encapsulated which, frankly, for Floridians and other places in the US who live in tropical and subtropical climates, mosquito control makes healthy living possible in many ways.

Guest 3 28:13

Right. And I was in Peace Corps. So I definitely know what you're talking about by mosquito netting and hearing the buzzing all night. So there definitely are places in the world where they don't have the capability to conduct mosquito control, like we do here in the United States. And that's one of the great things is there's constant research being done of how to do it better, what exists to control mosquitoes in different ways that we haven't thought of. So we're very fortunate to have those capabilities and to have associations that really work hard to basically progress mosquito control in the best way possible, keeping the environment in mind. But some of the ways here in Florida in particular, mosquito control is regulated highly by the Florida Department of Agriculture. One of the reasons to I wanted to touch on before I get any further is mosquito control, particularly in Florida, is really big for the economy. You can imagine, what tourism was like, in Miami during Zika, when people were concerned about coming here, or maybe even having mosquito control in places where people like to come such as the beaches, and parts of our theme parks and things like that. So it's also an economy boosting mechanism for us as well, not just public health, but making sure we have economy increases coming into the state. So it's really, really important. And historically, especially in the state of Florida and in other regions of our country, mosquito control played a really large role in eliminating yellow fever and malaria from being something that's here endemically. We used to people heard of the Bible Belt in the country well, we used to have the malaria belt in Florida in the 1900s, stretching from Jacksonville, St. Augustine, that whole area all the way over to Pensacola. So we have basically eliminated these issues through the use of mosquito control and other mechanisms. So it's really played an important role for us as well, not just for public health, like we mentioned, but also the economy.

Amy 30:12

That's really interesting. I guess I didn't really think about the economic impacts of having mosquitoes in an area.

Jamie 30:20

I think that's a good point as well, that I hadn't thought about. People who want to come to Florida don't want to be nibbled on the whole time they're here.

Amy 30:27

I mean, it's kind of a pain to just be eaten up by mosquitoes. So that's just really interesting. So you've touched on this a little bit Caitlyn, mosquito control, is there for public health. I'm hoping that all beekeepers have public health in mind. What else? You've already talked about how mosquitoes and honey bees are fairly similar. But what about mosquito control and beekeepers? Can you talk about what they have in common, similar concerns, different interests?

Guest 3 30:57

Yeah, absolutely. So this is one of my favorite things to talk about. Because when I came over to the mosquito control side of things, because I used to be an apiary inspector, myself within FDAC, I started to see similarities that a lot of people don't really think about. So beekeepers and mosquito control actually have some similar concerns. One of the things of course, as a beekeeper myself, what's the major topic I think about throughout the year? Varroa mites. How to deal with Varroa mites, thinking about my threshold levels, my sampling every month to figure out how many mites I'm seeing in my hives, well, mosquito controllers do that, too, they have to do surveillance, they have to set their own threshold levels of how, when, and where to treat. There's a lot of things they have to be concerned about as far as using treatment, making sure they're not having resistance in their hives, utilizing integrated pest management to tackle these problems. Mosquito Control, of course, is trying to do it on a bigger scale of doing multiple species rather than just one. So it's a little bit more complicated. But again, the mindset is there. What to use, when to use, am I rotating chemicals? Am I doing the right thing in this area? Am I keeping track of all this information? So those are two things that beekeepers and mosquito control have a lot in common. Another thing too is the media, understanding the science behind honey bee biology, swarm growth and dogpile? Well, some people based off maybe with the media, or what they saw on Facebook or YouTube might think that they're going to be aggressive, or understanding the truth behind quote, unquote, killer bees. Well, it's the same thing for mosquito control, when homeowners don't realize that they're producing their own mosquitoes in their backyard, we're actually making breeding sites by leaving out old toys and, leaving standing water in certain places or not cleaning out their gutters. So it's really important that they realize that they both have similar concerns on the media front of getting the right message out there that is completely truthful for people to understand who are not familiar with it. The other school of thought to for, understanding it's important too is these are both insect people. Mosquito control is fascinated by mosquitoes and honey bees, and beekeepers are all into understanding more about honey bees and the pests that deal with them. So we're all insect people at the end of the day, and that's something special because some people are not insect people, as you guys know.

Jamie 33:29

Yeah. The people who aren't insect people are just weird.

Amy 33:33

Yeah, we're not the weird ones. It's everyone else.

Jamie 33:37

So I want to expand on some of the things that you mentioned, we've talked, we've used the word control a lot, you've already touched on it just very briefly, but I'd like to ask you about mosquito controls strategy, to manage mosquitoes for public health purposes. And even though it's a system called integrated mosquito management, but I also want to, I want you to touch on what homeowners can do as well, kind of that two tiered approach, what are some simple things homeowners can do to minimize mosquito populations in their little local area? And what happens at the state or local level to control mosquitoes? So let's talk about that quite a bit.

Guest 3 34:15

Yeah, so basically, what homeowners can do, and anyone who lives in Florida, they have probably heard this many times, because this is about the time of year when we're going to start having the media, you're gonna start hearing on the radio, is to basically conduct source reduction, which is essentially just getting rid of breeding sites in your home. Taking care of things that are on the ground that are holding water, or that old tarp that's on your boat that's now made a depression and where those mosquitoes are breeding. Make sure you try to clean those things out or deal with those mosquitoes. And I mentioned the gutter earlier, but it's really important because I've had someone [say], "I cleared the whole yard, I got rid of everything and I still have mosquitoes!" I go, "did you look up?" and they said, "what do you mean look up?" I go, "Did you check the gutters?" They're like "No, I didn't check the gutters." So I mean, it can be all over in parts of the yard if you're not actively looking for them, we often use the scale of only a bottle cap of water is all that's necessary.

Amy 35:13

That's what I was just about to ask you, I've heard that a bottle cap is enough to breed mosquitoes if the water isn't moving, or if you don't empty it out, or at least spritz some water and have it moving. Is that so? That's true?

Guest 3 35:26

That's exactly true. And yeah, I think we always talk to, if I end up talking to the public, and they're like, "Well, I love my birdbath," and I'm like, I love that you have a birdbath, just make sure you're rinsing out, maybe scrub off the edges, because I mean, these eggs are extremely tiny. It's gonna look like dirt. If they're clumped together, you're not going to know the difference. And in the state of Florida, one of the things I learned from previously talking to beekeepers, is we like to put water out for our bees. Because water is really important. It's one of the things they need to go and forage for. So by putting out water for your bees, especially in the summertime, you're you're breaking down that track to make it a little closer to home. But if you don't change out that water, you're making a mosquito habitat.

Jamie 36:10

Yeah, there's two comments I have about that. I tend to see mosquitoes most in my dog water troughs that we have to regularly pour out and do exactly what you're saying. The other thing too is I go to church with a lot of livestock farmers, and they talk about the mosquito issues that they have in their livestock watering troughs. So they actually purchase fish to put in their livestock troughs so that the

fish eat the baby mosquitoes so that they don't have to go turn the water so much. They've got all these little fish swimming around, and they're eating it. So I think that's a pretty clever way of trying to address it in that kind of situation. Yeah, absolutely.

36:44

Absolutely and there's lots of things like that, where you can just have some creative thinking, to solve issues that you may have. A lot of pools that are not being kept, a lot of bank-owned homes or things like that, they do put fish in the pool until it will get reutilized at some point.

Guest 3 37:02

What kind of fish do they use?

Jamie 37:07

Well the people I know use goldfish, they just go buy some 25 cent goldfish and throw them in their water trough and literally zillions of goldfish are produced, and they live happily. I mean, I can always envision the cow squatting down to look into the water, a little fish comes up to the edge, but yep, that's what they do.

Guest 3 37:26

Yeah, we tend to recommend using fish that are more adaptable to the environment. But we always tell people, make sure it's a closed off system, which the trough would be. Those goldfish won't do anything, but we usually talk about Gambusia, which, actually, their common/nickname is mosquitofish, because of the fact that they will just go after mosquito larvae with no reservations. So they're a really great useful tool, we have several larger mosquito control programs that use them very often. They give them away to the public also. So they have fish giveaways, and you can use them in your lakes and in your pond in your backyard. So yeah, fish is a really important biological control for mosquitoes.

Amy 38:12

That is so awesome. I feel like I'm learning so much right now about mosquito control.

Jamie 38:20

What about this larger public level? I mean it's neat for homeowners to address that. But really, beekeepers, when they think about potential mosquito control incidents, they think about things that result from this kind of public attempt to control mosquitoes.

Guest 3 38:36

Yeah, so public attempts to control mosquitoes are usually done at the local level. So we're talking about a mosquito control that was developed by local governments. So county, maybe the city level, things like that. So those are usually how mosquito controls are set up. And it can be different throughout the country, mind you. So this is just examples for here in Florida, to understand a little bit more on a local level, but that's how mosquito controls are set up. Those are really big, especially certain times the year, sometimes they operate seasonally. So they're only maybe working from May

through the end of October, depending on the season, depending on our temperatures, those also play into fact. And that's why surveillance is so important to understand what's going on at those local levels. But it depends on the range of the mosquito control too, as to what their capabilities are. Some are very small programs, like I said that operate seasonally. Some are larger programs. And a lot of this has to do with population. How dense is the population in that area, the mosquito population will likely be larger. So you're dealing with more homes, more folks, more areas for mosquitoes to have cryptic habitats. So there's a lot of things to consider at the local level that just make it very different depending on what part of the state you're in or even what part of the country.

Amy 40:02

Caitlin, when I was in Orange County, Florida, we used to have mosquito control doing a lot of outreach and education. And they would typically come to the Beekeepers Association meetings. And so I'm wondering, what advice you have for our listeners, and how they can form a partnership with their mosquito control?

Guest 3 40:21

Yeah, so that's always great. We do have larger mosquito control programs usually do have an education person, and a lot of the technicians actually, so the people who are really the boots on the ground, people who are actually interacting with homeowners and doing inspections of yards, they actually would go to associations and talk to beekeepers about what they're doing. Because really, when it all boils down, a lot of this is just effective communication, which means active listening, listening to both sides, because this is a two way street. We got to hear the beekeeper's side and the mosquito control side to understand where both perspectives are coming from. So I think one of the biggest things is having great communication. That seems to be the most positive outcomes come from that is just kind of understanding, when will they be in the area? What's going on? What's going on with illnesses? Are there cases in the area? How's this mosquito year looking? Because it is seasonal, so it does have its ups and downs, some years are worse than others, depending on certain factors. So really effective communication is probably the best tool that we have to create partnerships with stakeholders, mosquito control, beekeepers, or otherwise.

Jamie 41:35

I think that's really good. Can I tell you I would say once or twice a year, I probably get emails or phone calls about mosquito control. Is mosquito control going to hurt my bees? And I think maybe Amy, one good way to deal with this is maybe we could talk about this in the question and answer session today later on. But what I would say Caitlin is, we put together some resources, I know you guys do as well about what beekeepers can do regarding mosquito control. And I think one of the key things that you just mentioned is super important, this idea that you can start developing a relationship with your local mosquito control district, or whoever it is responsible for doing that. So there's lots of strategies, make them aware of where your colonies are, things like that. What are some things, as those partnerships form between beekeepers and mosquito control district, what are some things that beekeepers can do to make sure that there's no conflicts between the two groups? What are some things that they can do to make sure their colonies are well protected, or appropriately away from mosquito control?

Guest 3 42:36

There are some things they can do, like we talked about with effective communication, if there's something that you're concerned about, you can call up mosquito controls and discuss whether they have notifications. Do they provide that? Not all mosquito controls have that capability. Some do. Things are different, though, depending on the time of year, if there's a public health alert in certain areas, they have to go with what is the best for public health overall, but I think it's great if beekeepers can pull, talk about where their hives are, maybe discuss it with the mosquito control, because mosquito control actually has personal suggestions, usually for the county, explaining where they're going to be things, they run into problems for them as well. I definitely think it's one of those things of hive placement on properties, maybe not putting it very close to the road, things like that, just kind of being aware of the situation of where to put your hives and how to contact and talk to mosquito control.

Jamie 43:41

One thing I'm going to add, Caitlin, is that it's impressive to me since my time here in Florida, and I know this is true across other states and hopefully around the world, is how much mosquito control individuals have shown that they're aware of, and they care about the bee issue. For example, at our University of Florida IFAS bee colleges, we get a lot of mosquito control specialists come to our bee colleges or participate in our master beekeeper programs or email me and ask me questions. And furthermore, as you've mentioned, already, there's a lot of education going on in the other direction as well where the mosquito control districts are speaking at local bee clubs or state associations. And they're even having me speak to their mosquito control meeting. So I think I think this communication is good. It seems to really have helped a lot in Florida. There's some other things that beekeepers can do as well. But yeah, I think everything that you said is really important for beekeepers to know.

Guest 3 44:33

Yeah, it's great to have so many outlets for education. I think that's maybe some the progress that we've seen in the last couple of years. It's just having those opportunities for like you said, some cross division training of them going to bee college I've had several mosquito controls who actually went to the last bee college and said, I had no idea even based one of you told me, they were just astounded by the level of information.

Jamie 44:59

And how awesome we are.

Amy 45:01

Obviously. Bee College number one.

Jamie 45:05

Of course, he was mind boggled by our bee college. I don't know what else he would expect. I get what you're saying.

Guest 3 45:12

Yeah, it's great and beekeepers too, they've known me over the years. I know what it's like to be a beekeeper, we've actually had mosquito control, several of them, either A have hives, or B are looking to get hives for their properties of where their mosquito controls are, because they're so interested in becoming beekeepers themselves and learning more about what beekeepers go through, and they're really just trying to do the best they can for public health in mind. Just trying to keep an open perspective and do what's best for the whole community.

Jamie 45:44

I think it's funny, a lot of mosquito control people are start starting to keep bees but I can tell you a lot of beekeepers are not trying to keep mosquitoes.

Amy 45:55

All right, Caitlin. Well, thank you so much. Everyone, that was Caitlin Gill, environmental specialist. I'm gonna go through your whole title again, Caitlin, Environmental Specialist III, Mosquito Control Support Specialist for the Florida Department of Agriculture and Consumer Services, Division of Agricultural Environmental Services, who is also a beekeeper if you have any questions. I'm sure she's available to answer emails, probably not phone calls or texts. But we will be adding some information in our additional resources. Thank you so much, Caitlin. Thanks, Caitlin.

Guest 3 46:30

Thanks for having me.

Amy 46:38

It's everybody's favorite game show. Stump the Chump. Hey, listeners, it is that question and answer time our favorite segment of our podcast I can't say it's our favorite. Our guest speakers are actually our favorite.

Jamie 46:56

I tell you, Amy, my kids love the segment because they love the fact that it's called Stump the Chump, and they know that I'm the chump, and they absolutely love our theme music. In fact, every time -- we're both recording from home because it's COVID -- every time podcast is recording, my son, "Dad, is it podcast? Are you gonna get stumped today?" I'm like, "No, son, we only pick the questions that I can answer."

Amy 47:20

That's hilarious.

Jamie 47:23

When you're picking the ones that you can answer.

Amy 47:25

Just ask him like if he wants to be the chump sometime. We'll have him on.

Jamie 47:30

I was thinking we ought to get that little fellow on the podcast. I'm not sure what we would do with him, but he'd get a kick out of it.

Amy 47:37

Well, train them early. Train them early, Jamie.

Jamie 47:40

Let's see that first question.

Amy 47:42

We've got three questions today. We just had a really great episode with Caitlin Gill, and with the Florida Department of Agriculture and Consumer Services. And so I guess one of my questions for you is what are things that beekeepers can do? We talked a little bit about relationship building in that segment, but I'm wondering what your suggestions are for beekeepers, so that they can prevent mosquitoes.

Jamie 48:03

So Amy, that's a great question. It's a great question for a couple reasons. That's a great question, one, because a lot of beekeepers believe that there have been chronic negative interactions between mosquito control and the health of their colonies. And it's a good question too, because there's just not a lot of data to support that. So we've got this issue where a lot of people are believing that mosquito control is impacting their colony significantly, but oftentimes in their investigations, there's just no clear link and given the breadth and scale of mosquito control here in Florida, for that matter around the world, it just seems like it would be more obvious if the link were really there. And I think that's one of the great things that Caitlin did is kind of talk through why mosquito control is necessary. It also gives us an avenue to explore how to get answers to our questions. So when I first got hired at University of Florida, this was actually a very quick, nearly immediate issue. So a colleague of mine at the time, Jerry Hayes, who's now the editor of Bee Culture, he and I put together a fact sheet, an EDIS document, a University of Florida Electronic Document, on the interface between beekeeping and mosquito control. And what we did is we came up with a list of a few things that beekeepers can do and I'll just read them to you from this document. For those of you who are listening, this will be found in our show notes, as well. This particular document will be. It says your mosquito control is likely being done by a mosquito control district, in your area. Wherever you are in the world. There's some formal group responsible for mosquito control, they no doubt have a website, go to their website and find your contact person. Who's the individual who's in charge of that in the area? And maybe sit down with them express some concerns and you can develop strategies for showing where your colonies are. You can make sure they're aware of concentrations of apiaries so that maybe they can avoid spraying in those areas. And also, a lot of mosquito control specialist I know will go over their product list with beekeepers and say, hey, here's what's available for us to control mosquitoes. And then beekeepers, if they get some

product label training, they can point out the ones that are perhaps less toxic to bees and pose less of a risk. You can also encourage mosquito control specialists to spray when it's dark, which is what a lot of them do anyway. That's when the majority of mosquitoes are out. But it's little things like that, here's my apiary, here's some compounds that I would rather you use or formulations I'd rather you use, here's some mitigation strategies. But also, beekeepers can do things for their own colonies. Number one, you can relocate your colonies in an area that's not sprayed regularly. Caitlin mentioned something that I want to reiterate, try to keep your colonies away from the road, if it's a truck going down the road that's fogging for mosquitoes, you want your colonies perhaps in the backyard, and to have some sort of barrier around them, maybe there's shrubs around them or something that would limit drift of these applications to your colonies. I tell people don't cover your colonies, a lot of people want to run out and put a plastic bag or sheets over their colonies. But mosquito control almost always occurs when it's hot. That's when mosquito populations are out. You could suffocate colonies and cause other problems. Dr. Bill Curr from the University of Florida taught me this trick and one of the things that he said is you could get a sheet of board or a sheet of plywood or something that's larger than the footprint of the colony and simply sit it on the lid of the colony. So if it's being sprayed or fogged from above, it won't touch the colony. Basically the shadow of that board on top of the hive is larger than the hive itself. So there's a lot of these risk mitigation strategies. But I want to give one final comment that I think is important for beekeepers in this regard. Before, if you experience an issue, during a time of year that mosquito spray is happening, before you go blaming mosquito control, look inwardly first. What were my Varroa populations? What was the nutrition status? What was the quality or history of my queens? Is it something I've missed that could have contributed to this? Before you know expanding the circle to include some of these lower risk probabilities.

Amy 52:23

That's your PC way of saying check yourself before you wreck yourself.

Jamie 52:26

Check yourself before you wreck yourself. I suppose that's good advice. But long story short, mosquito control is not going to stop. It's a public and animal health issue right now, protecting public and animal health. So we as beekeepers have to learn to communicate with our mosquito control districts, and follow some of these other risk mitigation strategies that we've outlined in this EDIS document that will be linked in the show notes.

Amy 52:49

Awesome. Okay, so the second question is about nutrition. Response.

Jamie 52:57

Nutrition. Can't wait, take it away.

Amy 52:59

So there are some people that are unsure about their sugar water and what ratio to use? What ratios do we recommend? And why? And when? And how? All of the above.

Jamie 53:11

So there's generally two ratios of sugar water that I've heard about in my lifetime. And that's one to one where it's one part sugar to one part water and I'm gonna pause for a second. So what is this part? You as a scientist always have to get into the weeds. One part sugar to one part water? Well, some people say it's weight. One pound of sugar and one pound of water. Well, that's a little odd, I usually do it by volume. So if I'm making one to one sugar water, what you can think of is it a one gallon milk container, if half of it is sugar, then you fill up the rest of the way with water, that's roughly one to one. Two to one would be two parts sugar to one part water. So think back to that gallon milk jug, it would be two thirds filled with sugar. And then the other part with water and obviously, the more sugar in that solution, the hotter the water's going to have to be initially to dissolve that sugar. So one to one and two to one is what beekeepers will hear. So what do they say about that? Generally speaking, they will say you feed one to one, if necessary, in spring or early summer. The idea is that it's closer to the sugar to water ratio in nectar. So it might stimulate colonies to expand as if it were an incoming nectar flow. And then they argue that in fall and winter, you would feed two to one because it's closer to the sugar to water ratio in honey. And you're trying to give them two to one because you want them to store it quickly. So the idea of one to one they use it for growth, and two to one they use it for storage, but I've never seen a research project actually seeing if that's important to the bees. So you're going to hear one to one [for] spring and summer, two to one [for] fall and winter, for those principal reasons.

Amy 55:05

Awesome. Thanks. Okay, so the third question that we have, I'm just gonna go ahead and read it straight from the beekeepers. So I have a split that didn't successfully requeen a month ago. I added a new frame of eggs and I left them to do their work. They made a queen cell. It looks like she's hatched, but there's no sign of her. And although I'm not seeing multiple eggs in a cell, I'm seeing some patchy drone brood on several frames. I'm thinking laying workers and I've never had them before. What do you think? It's pretty poorly populated now; is this a loss?

Jamie 55:36

Yeah, so there's a couple things I'll say here, number one, once I see an empty queen cell, one that has been emerged from naturally, I will give that colony two weeks to have a mated and laying queen. That's about the upper limit that I'll give them. So let's pause and visit some of the terminology here. What is a queen cell that's opened naturally? That's one that the queen emerged from the tip. So there's a nice circle cut at the tip of the queen cell. And that thing is empty, so that queen emerged. If she emerged hours before you went into that colony, then it can take her up to two weeks to mate. That's an approximation, but two weeks is about what I will give her. It usually is a little bit less, but that's the max I'll give her. So two weeks later, if I'm not seeing lots of eggs, and I can't find a queen visually, then I go ahead and combine it, especially with the population is low, I go ahead and cut my losses and combine it with another hive. If it is a laying worker, if it does, in fact, develop into laying workers, then you're going to have to combine it or you're going to have to requeen it with a nuc. But the fact that this beekeeper called it a split makes me think that it is already a nuc, so I would just combine it. So the audience may ask me, what's a laying worker? When a colony fails to requeen itself,

the ovaries of some workers can develop to the point where they can lay eggs, but workers cannot mate. So they can only lay unfertilized eggs, meaning they can only produce drones. So a colony headed by laying workers is doomed. The catch is, is that when workers start to lay, they also begin to make the pheromonal bouquet of a queen. So the bees think they have a queen and it's going to be tricky to figure out which workers that want to lay an egg. So if you've got laying workers it's just a write off. You requeen it with a nuc or you otherwise just combine it. So long story short, I give them two weeks post emergence to lay eggs, and make sure that those eggs are in a good pattern. And that I'm seeing evidence that those eggs are in fact, fertile. So a few days later, you'll see worker larvae being produced. If none of that is happening by weeks two or three, then I would combine it back with the original hive and start over.

Amy 57:54

Awesome. Thank you so much. And those are the questions for our q&a in this segment. Thanks, Jamie. Hi, everyone. Thank you so much for listening to this week's episode of Two Bees in a Podcast. We would like to give an extra special thank you to our audio engineer James Weaver, and to our podcast coordinator, Jacqueline Aenlle. Without their hard work, Two Bees in a Podcast would not be possible.

Jamie 58:23

For more information and additional resources for today's episode, don't forget to visit the UF IFAS Honey Bee Research and Extension Laboratory's website UFhoneybee.com. Do you have questions you want answered on air? If so, email them to 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.