Kent Honl: The Disease Triangle, The Health Triangle

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Jamie Vidich: [00:00:00] Hello, and welcome to the Conference Rewind video series. I am Jamie Vidich Director of Educational Product and Services at the International Society of Arboriculture. Today. I'm pleased to bring you "The Disease Triangle, The Health Triangle" by Kent Honl. This presentation was originally given at the ISA 2020 Virtual Conference, and the views are those of the presenters. Now, sit back and enjoy this presentation.

Kent Honl: Oh, welcome everyone to our ISA 2020 Virtual Conference session, The Disease Triangle, The Health Triangle. I am your speaker Kent Honl. I work for Rainbow Tree Company in Minnetonka, Minnesota, United States of America. I've been with Rainbow Tree Company since 1994 in a variety of roles from Technical Arborist to Consulting Arborist for 15 years.

And my current role since about 2012 has been performing technical training and research projects within the company. And the whole goal is to merge scientific research and practical applications for arborists to put to use out in the world. And I've got my ISA Board Certified Master Arborist qualification, which I picked up in 2007. And I also have the ISA TRAQ certification.

Along with my work at Rainbow Tree, I'm also an adjunct faculty in the Landscape Horticulture Department at Hennepin Technical College in Brooklyn Park, Minnesota. I've been in that role since 2014. And you can see here a group of students and I doing some tree planting project.

That's always part of our arboriculture 1 class. Our objectives today in talking about the disease triangle and the health triangle, we'll [00:02:00] look at that familiar disease triangle concept and reframe it as the health triangle. Just take a different angle on things and look at how this can inform just about everything you do as an arborist and how to get the message across to your clients so that they can apply it.

And the pay off in all of this will be a greater understanding for you of treat diseases and conditions and an increased effectiveness in your practice. As well as a renewed relationship with your clients.

So getting right into the material, the disease triangle concept out of plant pathology or integrated pest management, is pretty familiar to most everyone, and sounds so basic as to almost be useless, you know really all it is: is for a disease to exist there has to be the interaction of these three conditions. A host tree within an environment that makes a pathogen activated or able to attack the tree host. So you look at that and think, well, okay, how is that of any use? That sounds so obvious. But if we start looking at it with an actual concrete example, take a crab apple in mid-winter like here in the upper Midwest where I'm located, there's this crab apple known to have apple scab fungus, the foliar disease.

Because we saw it in August, yellow leaves with brown spots dropping on the ground. But right now in the middle of the winter, there's just buds on it. There's no susceptible tissue on there. The environment is also cold in the dormant season and the pathogen is not active that's overwintering and leaf litter.

So right at this moment, the elements of that triangle, if we look at them, there's no disease there yet. But when spring arrives, the environmental changes that show up, [00:04:00] temperature increases, moisture increases with spring rain. It's very well documented as the temperatures warm up the time for the infective period decreases.

So the conditions in the environment change to make that all possible. At the same time, when the host becomes receptive, the leaf emergence brings out the vulnerable tissue, that soft new tissue. That's about the size of a mouse ear or squirrel ear, that's without any waxy, cuticle or protective surface over it. So it's very vulnerable when the temperatures are warming up and when the leaf surface gets wet.

And at the same time, all of the spores are germinating and that leaf litter that's down below the crown of the tree. So now in the disease triangle, you've got all three of the elements in place, the environment, the host and the pathogen, are all coming together to make that disease start to happen again.

Now, if we look at the environmental coroner, just with our awareness of climate change nowadays, and look at that from that perspective of the disease triangle. We're seeing a lot of shifts in temperature and precipitation patterns. We'll talk more about that. But one thing that we're seeing in the upper Midwest is warmer, earlier, wetter springs, and that's leading to more foliar fungal infections.

There's a great increasing list of things with lilacs, [unknown], uh needle, or not needle, but a foliage diseases or bur blight. It is a Oak disease that we have in the upper Midwest, because we're getting spring arriving earlier. It tends to be warmer and wetter. Right at the same time when the new leaves are emerging on the Oak trees.

And by the same token, you'll run into longer, hotter summers that add up to more drought stress trees in some parts of the country, like the [00:06:00] Rocky Mountains. Where we had massive loss of pines due to the pine bark beetle infestations. Because there's a longer season for insects to develop. You know, you've got two generations per season now in areas where there's more drought, stress trees, longer hotter summers.

So the environmental change, you look at the disease triangle aspect of that things that were formerly native insects or fungi that were at a small rate of propagation in the environment now have increased because of that shift in the environmental conditions.

So, if we're looking at the disease triangle, the power that I find in it is how can we intervene within that? It's not just about controlling pathogens. We can work with any of those conditions within the disease triangle. Work with the host, or the environment, or the pathogen. It's not just focused in one corner.

You know, I refer to it as the, got a problem, take a pill philosophy, which tends to be our default setting in American culture is, you know, the phone rings. Hey Kent, what kills apple scab or what kills Japanese beetle? No, we want to go straight to what controls the pathogen or the pest, but there's other things that we can do.

We'll get more in detail about that. I don't mean to be completely dismissive about integrated pest management. That's an important thing about arborists do. Essentially what we're doing is stepping in to aid the defense mechanisms of trees, where they don't have the ability to do that themselves.

And that's where we have the toolbox approach in pest management, where there's all these different insects, mites, fungi we can control with a variety of methods. Whether that's the spray application, systemic insecticides, or root flare [00:08:00] injections. That's all geared towards controlling the pathogen where a tree doesn't have the ability to do that on its own.

But what if we flip things around, instead of focusing on this idea as the disease triangle, what would it look like if we talked about it from a new perspective of the health triangle. Where we can reduce the impact of pathogens or pests. Or maybe even eliminate their possibility to show up, by working on the host or the environment aspect of things. Where we diversify or change the host or make changes or modifications in the environment.

So that's a rich area to work within or to kind of bring yourself back, remind yourself that it's not just about surrendering to these pest attacks or we don't know how to kill them off in time. There's a lot of other things to do when you look at it from that angle of the health triangle.

So first off, starting with the host, the upper corner of that triangle, if we diversify the host. One thing you can do is just remove the susceptible hosts. That's a one thing I did on my own wooded property across the river in Wisconsin, is I cut down a large Ash tree that was left. The best way to not have Emerald ash borer. I figured is to just take out the host and that's been milled up into slabs that will become patio furniture for me in the spring.

So not everyone will be able to do that necessarily, but removing susceptible hosts is one option. And then in the wake of that plant resistant trees and a greater level of diversity. In the community where I live, Minneapolis, they've really been actively planting a much greater diversity of trees after removing the Ash population. Staying ahead of that as best they can against the emerald ash borer. [00:10:00]

So changing the host, if you choose the species that's more adapted to your local climate and soils. One species I really like to fall back on is the Eastern Red Cedar. Some people don't like that for a variety of reasons, but to my clients who did go with the Eastern Red Cedar tend to be lot happier than trying to keep Spruce trees alive. That seemed to require life support system. Against a growing list of fungal and insect and mite problems with spruce trees. So you put in the right resilient species and you have far fewer problems that you have to deal with and try to fight against.

Also, I think we can do in modifying the environment is to diversify the other plantings, besides the tree species, is what's going on in the wider landscape. And nowadays the pollinators get most of the attention, which is a good thing. We all need to have pollinators around for making sure our crops, our food crops, get pollinated and the food supply is in good shape. But there's also a lot to be said for increasing the food sources and habitat and everything for beneficial predator insects that will keep the pests in check.

So by adding more flowering plants, we're taking care of the pollinators and other beneficial insects and things just are more interesting to look around at too with a diverse landscape.

There's a lot to be said in the environmental corner of the health triangle for just the cultural practices. You know, you get a lot of questions as an arborist about well after Dutch Elm disease, after Emerald Ash borer, after any kind of a devastating tree pest or disease situation. What trees do you plan to after that?

Well, I often assert that how the trees are [00:12:00] grown is more important than which species you plant, because if you have bad cultural practices, whatever you plant, isn't going to survive and thrive very long. So just looking at this picture that I have posted up here. Let's take a brief half a minute. How many things can you see going wrong in this picture potentially?

Well, for one, I'll just cut right to the base of this tree. Looks like a telephone pole. So the planting was not really tended to correctly in the first place. You know, I'd like to see the ball and burlap tone apart and find the root flare. And rock mulch around it, that's some limestone-based stuff.

Actually, I have often said rock mulch is sort of a contradiction in terms. Rock is a ornamental feature of a landscape, but malt is something that should be out of organic materials. So that's, you know, a person will preference or, you know, something that I've come to see over time that limestone-based rock material just elevates the pH of the soil.

Chances are very high that there's some kind of a bedliner plastic or fabric under it that will interfere with the oxygen access for the root system. And lastly that a dark black top surface of the driveway near there is just introducing a lot of heat stress for this tree. So, you know, you can do a lot just to help the survivability of trees, whatever species you choose to plant, with the cultural practices.

And environmental modification in the cases where you've got the foliar fungal diseases, like the apple scab, we talked about one thing that a client can do is just rake up the fallen leaves to reduce the fungal inoculum that's right nearby below the crown. If you [00:14:00] don't have the foliar fungus disease, it's always best to allow the leaves just to stay in place. As a source of organic matter, try to mimic the forest recycling of the organic matter on the site. But that's one possibility in terms of the environmental modification is just getting the source of the fungal inoculum out of there.

And a really big thing is the role of irrigation in cultural practices. Where you have sprinkler systems where the head pops up, especially with evergreen plantings. We see this a lot up in Minnesota. Everyone loves the Colorado blue spruce, but then ask the client to turn on the irrigation system. So you can see what's happening with that.

And many, a time that a head of the sprinkler hits right into the low lying branches of that spruce tree. And then you get this build up of the wetness that favors the needle cast fungi. Such as the needle blight shown on the right here. It's a very interesting way that manifests with the multiple colors as you follow back, the ages of the needles on the spruce tree here. The new soft tissue coming out is that lighter green, darker green is last year's needle. Year before that they're turning brown. And the previous season beyond that, they're just all dead and ashy, gray and crumbling off. So great to have trees irrigated, but things should be irrigated in the right way, such as a soaker hose, very low cost way to get the right amount of water at the right place at the right time.

There's a lot less water that's lost to evaporation. And lost to just running down the curve of the gutter that you see a lot of times and the spruce trees that I see that have soaker hoses around them, come through the winter a lot [00:16:00] better situated. They're not getting all this winter injury and needle loss. So a soaker hose is really easy to use and low cost, a good way to modify that environment and save on water.

And since, you know, as I introduced the whole topic with the reference to climate change, one of the aspects that we see with climate change is less predictable rainfall. That many seasons we swing between deluge of rain, massive rainy events, and then it might stretch for long time, weeks, or even months without significant rainfall, where we have drought.

So, this is where urban designs can play a role in catching water and hopefully releasing it slowly as it's needed. This is a example of two years ago, I was able to go to a conference in Hong Kong. And I saw this picture of a nice large tree, you know, for being avery highly populated in dense urban area.

Hong Kong does a great job of managing its green space and a little pocket parks and the outskirts of the city where there's a lot of green areas. And I noted this tree was able to grow to a pretty large size in large part due to the design that was made to account for the soil volume that it needed.

And there's kind of an area along the edge of it that runs diagonally. The rain from the buildings can filter down into that space. And there's even a hedge that circles around the base of it that keeps the foot traffic from walking right through there, compacting the soil or damaging the flare of the roots. And all those things are accounted for very nicely.

So this points to, you know, it's known the larger, you can get a tree to grow in an urban area. The more ecosystem benefits it's delivered. And this design is doing a great job of that. So, you know, [00:18:00] also

trees are the only urban infrastructure that increases its value over time. Everything else is subject to entropy and wearing down. But urban designs can play a huge role in helping us out in that whole environmental corner of our health triangle.

Further on that note about unpredictability of rainfall. You can look at the soil as the largest and most economical water collector. If it's managed properly, the urban soil is being compiled with low in organic matter are going to be less able to absorb water when it does land. So how do we improve our soil quality?

That's something first and foremost for almost every arborist who's working in our industry these days. So there's air tools, like the airspade, we've relied on this for almost 20 years now at Rainbow to incorporate organic matter. Cause if you can get organic matter in the soils, you know, it's well-known, you can improve all these soil properties, chemically, physically, biologically speaking, since most urban tree problems are soil related and increasing the quality of soil will make the trees grow better and help the soil become a better sponge or catchment system for the water that's available. You know, this is a very good practice and part of our mix of the prescription compost and everything. When we put in, when we treat soils with the airspade we've incorporated biochar now for about five years because of its porous structure and high surface area that can adhere water and nutrients within those pore spaces. So you have a reduced needs for irrigation and fertilizer.

And the studies have shown you get best results with biochar. If you have it in combination with fertilizer and or [00:20:00] compost. And as one of those tools in combating climate change, biochar is something really great because it's a stabilized form of carbon, made from wood waste. You put this in the soil. It's not going to just decay and go back into the atmosphere. This is taking carbon out of the atmosphere, putting it into the ground, where it belongs again, and it'll stay there. And another aspect with biochar tar, I find really exciting is that it's being studied as a systemic acquired response agent by Glenn Percival in the UK that using biochar and soils along with other kinds of mulches and amendments.

Glenn Percival's finding that these responses that show up in the trees often are enough to greatly reduce the need for fungicides or pesticides, or maybe not even need them. So this appears to be, I think of it as the frontier of arboriculture is what kind of soil amendments and systemic acquired response agents we can start to use.

So here you're modifying the environment and you're getting a host response out of it too. So two parts of the health triangle are being addressed with one soil amendment.

So now we get to the part about the, you know, bringing it out to the people. How do you enroll your clients in the health triangle concept. Because all these best practices, all this stuff that you know how to do as an arborist, in taking care of trees, they're going to add up to nothing if people out in the world don't hear about it and then apply it.

So there's the real art form in all of this is, how do you talk to people about it in a way that they get excited about it and want to do the work? Because most clients, they want to help. And the great benefit is then it takes the pressure off you to perform miracles with your plant health care or your pest management practices.[00:22:00]

And it'll make it easier when you're not fighting the adverse conditions the client has set up with the irrigation that they're doing in a not so helpful way or their lawnmower injury, or all the different kinds of things that tend to happen with a tree management, because people just don't know about managing trees. They're not arborists. That's why they call us out there. But if you have a relationship where the client, where they're just kind of saying, I'm paying you to take care of this throwing money at this, and you were supposed to make the problems go away. That's not a very powerful position.

You're just kind of expected to perform miracles. But if you get the clients on board with what they can do, as far as the health triangle as well, you're much better situated in terms of effectiveness and the quality of the relationship you have with the client too. So at Rainbow we've been using for years a consultative approach. There's actually more steps to it than four or these four elements, but I've kind of winnowed it down for this presentation.

The first one would be finding out what's important to people. Secondly, is positioning yourself as an arborist, as a practitioner. Third, is asking permission to offer the information or to educate people. And then fourth, educating your prospect, as needed, tailoring what you're telling people to their interest, their time basically respecting where they're coming from.

And this is not a set of techniques. It's about authentic listening. And I just finished reading this book called You're Not Listening, What You're Missing and why it Matters by Kate Murphy. Highly recommend this book. And the main quote that I pulled out of it is as follows here: "to listen well, is to figure [00:24:00] out what is on someone's mind and demonstrate that you care enough to know". Because if you're coming at somebody with a set of techniques to sell them something or whatever people are so inundated with messages and things like that, that they see it coming a mile away and they'll tune it out.

And we're all just so overburdened with that kind of stuff nowadays. But people will be amazed if you actually taking the time to listen to them. That seems kind of rare in today's world. So it's about listening, not about applying a set of techniques.

So the first part of this whole consultative process is finding out what's important to people. Show a genuine interest in their needs so that it helps you focus your time and your efforts on what's important. And then you can apply your expertise where that need is identified. And you're not kind of going on a wild goose chase on secondary things.

So you might wonder, well, how does that look on an actual appointment or a call with a client? Like, what would you actually say? And this might seem a little weird to do at first, you know, it takes some practice to get in and do this, but everything that happens with humans is through conversation. Really.

It's all just people talking to each other and figuring out where we're coming from. So it would look. And as an example, like this: "what's most important to you in choosing who you like to work with?". You know, if someone they're opening gambit is "well I got three bids for this project already." You know, are they just trying to angle for a lower bid on the project?

Or where are they coming from with that? And you can just say, yeah, "well, what's most important to you in choosing who you're going to work with to do the project". Or "what's the main thing we should take care of today on this appointment". It's all about kind of getting them [00:26:00] relating what's important to them so that you can respond and speak to that.

And along the way towards this connection with them, keeping in mind that good listeners ask good questions. Like a good question is: "can you tell me about your irrigation system?" or "when did you first notice these symptoms on your tree?". These are open-ended questions that require more than a yes or no answer.

Counter example of some, then that's not a good question. Something that leads them, like: "don't you agree that" et cetera, et cetera, or "are you watering your trees too much?". Something that's leading or accusatory, it's probably not likely to get them talking and relating useful information or helpful kind of connection with them. So it's all about just being a good listener.

And along the way, you know, these one through four kind of points, they're not like you have to follow this as a rote process, but positioning yourself, everyone interacting with people a lot, just to have a little elevator speech kind of thing.

Like for a new contact, you know, an elevator speech is not something you would use with someone you've already known for 10 years. But for new prospects that you're working with that are going to be your clients. Just something that's a concise user-friendly introduction, where you tell about 15 seconds about yourself and the company that you work for, or that you run your experience, what your credentials are. What's the focus of the company, its history, et cetera. And you just put this in where it fits in the conversation.

And the whole idea is to gauge the fit between you and the client. So here's a picture of me 20 years ago when my beard was not gray at all, I was just a young guy getting started out in the consulting. I had moved from being a [00:28:00] technical arborist and my little elevator speech had to do with, well, "I'm sort of a family practice tree veterinarian" because a lot of times general public hasn't even heard of what an arborist is. And you can kind of frame it in a. And ask if I'd asked them, well, "what's important to you with who you like to work with", and if they'd say, "well, I just want a cheap, the cheapest bid on removing this tree", then that's good information.

Well I'll give you the, a price and it might not be the cheapest. Or if they'd say "I just got a bad experience with the last arborist, because they didn't seem to know what they're doing. And. They just fled town after the tree fell on my house", whatever it was, you know, then you can speak to that and say, "well, yeah, I can tell you, I've been with this company 15 years and I've got my master certification", et cetera. You can speak to their need for what they're looking for at that point and positioning yourself as part of that, to gauge the fit between you and the client.

So then our third point here in our four elements is asking permission to offer. And this is hugely important. You're basically just getting permission from them, clearing the way for you. Because then you're not forcing anything on them. You know, the way it looks, it would be something like this, where you get called out to talk to a client and you can just easily introduced this, you know, "Hey, I'm a trained experienced arborist, if I notice something else that's important with your other trees, would you want me to mention it while I'm here?" And in many cases, people would say, "Well, yeah, that sounds interesting. Tell me more, you know, I heard from my neighbor down the street, you really help them out with their trees and they highly recommended you. So of course, you know, I had you out cause I want to learn more about [00:30:00] all that. What I can do".

Maybe it's on the other hand, a case where they say, well, no, I'm just interested in the Elm removal. I don't have time for that right now. Maybe a different time, then you're respecting their time and their interest by just speaking to them. But until you get that opening from them, it's just going to come off as pushing something on them that they didn't ask for, because that's what a newer consultant almost always feels intimidated by is that they don't want to seem pushy.

You know, that we've got all this idea about, you know, the used car salesman or whatever the stereotype is that we don't want to be like that. But asking permission to offer it goes a long way towards helping them clear the way for you, or respecting their wish for what they want to get out of the interaction with you.

So once they've opened that door or not, then your next step is to educate the client as needed about what the things you're noticing, or the things you might recommend for them to apply in the health triangle. Managing the cultural practices. Doing soil remediation. Whatever the case might be, but you're responding to their level of available time and interest and not overdoing it.

Because in my role in coaching, mentoring, new consultants, that's a lot of what I do. They get so excited about the things that they know that will help trees. And everyone's passionate about trees. They want to save them. That's why we get into being arborists, right. It's to beautify the landscape by keeping trees healthy. But you get so passionate about it, that that customer might have been ready to sign up for a project and you're talking to them long enough where they're just kind of overwhelmed and they want to get you out of there and say, okay. They'll just shut down again. [00:32:00] So don't overdo it. You might talk them back out of working with. Because the goal here is not to try to impress them with your vast body of knowledge. It's just to speak to the level where they are.

You know, sometimes you get people who are doctors, engineers, very technical people. You can geek out with them all day. Or other folks you just have to scale what you're talking about to meet them where they're at.

Then after those four stages, moving to completion. Just reaching a closure where the conversation would be basically asking, "is there anything else to cover that we didn't touch on during this conversation?". You know, that we might've overlooked. And then there's asking for the sale, you know, sale kind of has a connotation to it that people react against, but really in the reality of it, most of us are in business where, you know, you're doing services for people and you have to get that signed up in a calendar. So it's as easy as saying, "well do you want to get this into our schedule? Can we sign up this work for you?" You know, because a lot of times we just assume they're going to do it well, how do we confirm that with them? So asking for the sale is not like being pushy or sleazy or anything. It's just an authentic connection to them. Like you had me out here to talk to you about this and make recommendations. Would you like to get this into our schedule? It's not that hard to do.

Also asking for referrals. If you like our work, please pass my name on if you're comfortable with that, because our business is built on our reputation and referrals. And then following up with people. It's not blitzing them with a whole bunch of unnecessary messages, but people do appreciate a followup. Especially if there's services that need to be [00:34:00] renewed or seasonal reminders. Things that have come up that are unique to the season to put their mind at ease, like this doesn't mean a big threat to your trees it's just something that's normal. Like the needle drop on conifers, those kinds of things. It's all about moving to completion in those conversations.

So as we bring it to the end and wrap up things here, just to review what we talked about. The disease triangle can be flipped around to emphasize the health triangle. Take sort of a holistic approach where we're trying to reduce the impact of pests and pathogens, especially with cultural practices and recognizing the impact of climate change in all of this.

And arborists really are in a key role right now in combating climate change. We've always been that role to reduce heat island effects in urban areas, but that's even more important now. And the health triangle is a way that we can really reframe that to enroll clients in what we're up to you to bring them in as our allies, instead of our adversaries with the cultural practices that they're doing that set our efforts back.

So that'll increase your effectiveness of the treatments you are doing. And in order to do that, it's really just about being a good listener to people. Relating to them authentically. And at the end of the day, you can realize being a good arborist is not just about your technical knowledge, but it makes you a more engaged, and engaging person, when you're a good listener to your clients. And then they'll be able to know. What are the right things to do and actually apply them out in the world.

So with that thank you for having me speak and hope you've gotten something out of this and I appreciate the time. Thank you.