Legionnaires Disease: A Risk for Propagators©

Greg McPhee
Horticultural Communications, PO Box 339, Lismore, NSW 2480 Australia

Legionnaire's disease should be of interest if not concern for nursery propagators. It is a real disease risk and you should be taking steps to reduce your exposure. Now I have your undivided attention there is a bigger story to be told, so that you are better aware of the risks and see how you can limit your exposure.

Legionnaire's disease is caused by a group of bacteria, with most of the deaths coming from *Legionella pneumophila* and *L. longbeachae*. It was first described in 1976 when a group of American Legion veterans became ill after attending a meeting in Philadelphia; 221 fell ill with a few days of the meeting and 34 died as a result. You can see why people get worried about it.

However, you should not jump to the conclusion that this is a new disease. These bacteria have been isolated and found worldwide. It is through advances in medical science that identification was obtained and the causative agent specified more clearly. Also contributing to the "newness" of this disease is the fairly recent growth in large-scale air conditioning systems that allow its rapid growth.

In Australia the causal organism is strongly associated with potting mixes. Several cases involving the death of a number of people in South Australia and the Gold Coast of Queensland had as their source pot media. As recently as March this year an outbreak in Northern Sydney was reported in the press sighting pot media as the possible causative agent.

The reason pot media gets a bad name is that a particular species (*L. longbeachae*) has been regularly identified as being able to live and grow in it. It seems that as soon as this species is identified, pot media is under the spotlight. However all species are able to live and grow in pot media, air conditioning plants, and other places so some of this bad press may be unwarranted.

The bottom line for propagators is that *Legionella* bacteria can and usually does live in pot media. But that is not all the story and a closer examination of the bacteria reveals much more.

Legionella is a water slime. It lives in moist conditions and loves a bit of warmth. Put in some fertilizer and it will grow…dramatically. Think of it as being like yeast in a home brew kit and you get the idea. In the packet it lives but does not grow, in the vat it explodes.

What keeps *Legionella* in check in nature is temperature, antibacterial chemicals, and other microorganisms that compete better for food and warmth. In fact, it is very easy to stop the explosive *Legionella*'s growth stage but not so easy to kill off completely.

It is a survivor, and will live happily in moisture and dust particles just waiting for the right environment. It will float in the air; keep alive, but stay dormant in soil and just loves water.

It is an opportunist bacterium that just waits for the right conditions and then grows rapidly. We make the conditions right with composting.

To test how long *Legionella* bacteria can last, bags of pot media were inoculated then left for more than 12 months and after this still tested positive to *Legionella*. Don't think that steam or chemical treatment of media will save you either as media gets re-contaminated from dust particles floating in the air.

Treat all pot media as having the bug and you will have the right idea.

Ideal conditions for growing the bug are found in air-conditioning cooling towers. This is where (usually warm) water is poured in front of an air stream. The filters get a little clogged with dust and away you go, a perfect growth chamber. Composting pot media is also ideal, but so are water features with underwater lights, hot bubblers in playgrounds, and even water fog machines so popular as indoor ornaments. Nursery fog or mist units may be a source as well if the water is untreated.

But being there and getting us sick are two different things. The next step is to figure out how the microorganism infects us humans, a not so easy task. You need to breath it in to get an infection, not just get it on your hands or body. Most air-borne contaminants are blocked from entry by our nose hairs. It needs to get past these and lodge in the small chambers of your lungs.

Puffing cigarettes is a great way to draw plenty of smoke and dust into you lungs. If you are sticking your fingers into warm pot media, then placing them on your lips and dragging back then you are taking a greater risk. Most people who contract Legionnaires disease are smokers.

But what did I hear you say about our bodies natural system to fight diseases? Yep they are effective against *Legionella.* Our natural system is to build antibodies that fight infection. The antibodies are specific to the bacteria and it is by checking for these that doctors are able to confirm that you have been in contact with the bacteria.

For some people their defenses are down, like being sick with something else or having a history of smoking and drinking to excess. Being old does not help either, or being stressed, or physically exhausted.

If you were to look at the profile of a person who is at greatest risk it would be male, over 50, heavy smoker and drinker with a depleted immune system. At lowest risk are young physically active people who don't smoke.

It is rare to have the disease transmitted person to person (you don't get it from kissing) but surprisingly outbreaks tend to occur in groups rather than singles. This has been put down to growth at the source which is producing huge amounts of bacteria that is spread over a confined area.

The symptoms of Legionnaires disease are those of pneumonia; that is coughing, difficulty in breathing, and occasionally death. Now this is what makes Legionnaires a real worry. You can die from it and the chances are that if you get it, you have a 1 in 5 chance of not being around for your next birthday party.

Being called "pneumonia" can also explain why until 1976 we have not been able to identify the disease properly. Before then it was just another pneumonia, now it is Legionnaires. Medical researchers have been able to identify the microorganism and the antibodies that we humans create to fight it.

Determining if you have the disease is by taking a bacteria count, waiting a while, and then another to see if the antibodies are growing. The quicker the growth is, the higher the infection. But there is the catch with this process. Wait too long and your treatments do not work as the bug grows faster than the ability of the antibiotics to kill it off.

So the best approach is that if you are feeling crook and suspect legionnaires get into the drugs fast. Your chances of survival are greatly increased as a result. The good news is that the hospital health departments and medicos are now aware of the possibility and if you indicate that you work with pot media will start treatment early.

Right so now you have an idea of what it is, how it grows, and how you get it. The

real question is "how can I ensure that my risk of contracting Legionnaires disease is minimized?" That is a great question, and one that you can ask in your next occupational health and safety meeting.

The actions you need to take are the same for any substance that is identified as "hazardous" and yes in Australia pot media is classified as a hazardous substance. A risk assessment is needed, and then systems put in place to reduce the risk. It is impossible to eliminate the risk so we need to be happy with increasing our chances of survival.

I am talking about sometimes-simple things like ensuring the potting area is not confined, and having people who are on a tractor tipping it on a pile wear a facemask. It can be even as simple as keeping piles of pot media covered and requiring all staff to wash hands before breaks or a cigarette. No one is suggesting wearing full spray gear for propagating.

I have been asked if indoor pot plants pose a risk. The answer is that they do not, as the pot media is not agitated and dust is not coming from the plant. A bit of simple logic here helps enormously.

I helped develop a course on the handling of pot media and it is available from the Nursery and Garden Industry Association in Australia. It is a good introduction to occupation, health, and safety and has plenty of specifics on Legionnaires disease.

The risk of contracting the disease is less than $^{1}/_{10}$ of 1%; something to note. It is easier to die from being struck by lightning, shark attack, or crossing the road than catching this. But that matters naught when it is you or your family that is sick. With just a little care we can ensure that your membership of IPPS continues long into the future, and that is good for you and the Society.

So let me just reiterate my initial statement. Legionnaire's disease should be of interest if not concern for nursery propagators. It is a real disease risk and you should be taking steps to reduce your exposure.

Hopefully now you can go about doing just that.