Speaker 1: Welcome to Urban Plant Health Networks podcast series, the Good, the Bad, and the Bug-ly.

Drew Radford: Did you know that the simple act of gardening can also play an important role in keeping Australia free of exotic pests? Biosecurity is a shared responsibility. And one of the ways that Agriculture Victoria is helping protect our horticultural industries from exotic pests is through targeted surveillance. However, urban gardeners can also help by being vigilant and getting to know the difference between good and bad bugs in the garden, and then reporting anything unusual that they see. Tim Hurst, Senior Officer Plant Surveillance, Design and Analysis with Agriculture Victoria joins me in the studio to delve into plants surveillance and how urban gardeners can help. Tim, thanks for your time.

Tim Hurst: Thank you.

Drew Radford: Tim, when I think of surveillance, I'll think of police watching someone. What though is plant pest surveillance?

Tim Hurst: Well, surveillance is just watching and looking. And so plant pest surveillance is simply looking and watching plants to detect pests. It's as simple as that. And that could be on a number of scales. So I, myself am an avid gardener. I'll pot around my backyard, I'll do some weeding, I'll do some watering, but if I see some damage to my plants, I'll have a closer inspection to see what it's from. So I'm doing surveillance for pests right there.

 Somebody that works in a nursery, might do a routine stop check in the mornings, again, to remove any unhealthy plants for sale. They're doing surveillance for pests right there as well. An orchard or a production owner, employees, agronomists, or crop scouts. Now these are professionals that go through their orchard to identify pests mainly for the purpose of management, i.e. are there too many? Are they going to cause damage? Do I need to treat these with a pesticide or remove them?

 And for us, we're looking at preventing the establishment of what we call exotic pests. These are pests that are not native to this country, but they've had devastating consequences overseas, and we don't want to see the same thing repeated here. And so we're looking to make sure that those pests don't enter this country.

Drew Radford: Tim, what are the goals of surveillance then for exotic plant pests?

Tim Hurst: For exotic plant pests, it's to prevent their establishment in this country and to prevent those devastating effects that it can have. I think everyone's probably watched the show, Border Security. It's a bit of a guilty pleasure. That's what we consider our border protection or our at-border surveillance. And so that's the federal government and they're looking for high risk plant pests, and we've identified 40 for this country based on their impacts overseas and their likelihood of establishment. And they're looking for those specifically and trying to prevent them from entering the country.

 Now, of course that's not 100% effective, so we assume that some of them can therefore get through. And that's where, for instance, myself in the state government and maybe our production industry will step in and do what we refer to as early detection surveillance. So that's saying, okay, maybe there's a chance that this particular pest has come in, and we need to find it to make sure that it doesn't establish, which established just means obviously spread and build up a population so that it's here to stay essentially.

 And then we go through different phases of surveillance and different surveillance types and different people can be responsible for that. And so let's assume that our early detection surveillance does detect a pest. What do we do then? Then we shift our focus to surveillance that’s what is known as delimiting surveillance. So now we want to know, okay, we've found one, is it here? How far has it spread from where we found it? What's the population like? And how much of a problem is this going to be? And so at that point, we might start implementing control programs or eradication programs as they are called. We don't want this pest, so we're doing everything we can to get rid of it.

 Once we're confident that perhaps we've done that, we switch to yet another form of surveillance, which we'd call surveillance for what we call proof of freedom, or proof of eradication. And that again is similar types of tools, which I can talk about later. But the goal is to say, we've done this control, and now we've done this further surveillance for proof of freedom. We haven't found it, and we're quite confident that this pest is no longer in Australia. And that's the type of evidence we need to be able to show our international trading partners in order to be able to still trade our commodities overseas.

Drew Radford: You've gone through a bit of a list there of types of surveillance, but how's that surveillance achieved?

Tim Hurst: Different ways, there is targeted and general surveillance and I can talk about general surveillance later on, but targeted surveillance is what we in government would do for instance. And we'd look at a pest and we'd look at the likelihood of that pest coming in, where it might come in, and its biology. And based on that, we can target certain areas that this pest might be more likely to come in. For instance, fruit fly. So fruit fly is most likely to come in through infested fruit. And that's why you see the signs up at the airport. If you've got fruit, please put it in the bin now because fruit fly can come in that way. And so that's why we've got our border teams doing that.

 Again, assuming, as I said before, that maybe it's not a 100% effective, they get out into the urban areas because somebody has taken it home and thrown it in their vegetable bin or their compost, and now we have fruit fly. So we know where to look for those fruit flies and we can target those areas. Then you might have something like the brown marmorated stink bug. That's not going to come through in fruit. That's been shown to come in through infested industrial goods, and that's going to come through our ports and that's not going to end up in people's backyards. It's more likely to end up in these industrial areas. So we'll focus our surveillance on those areas.

 Now, what does surveillance mean? What are the types? It can range from anything. So ourselves, we use a lot of traps. There are different traps that are designed for different pests, and there are different lures. So some of these traps have a lured design to attract the pest to it so that we can improve its effectiveness. Sometimes traps don't work. So we might rely on very highly trained entomology staff to actually go out to these, what we call high-risk areas again, and look for them. They know what the signs are and they know what it is when they find it. There's a lot of new technology coming around DNA. So being able to take a sample of water or soil or a leaf and process that in the lab and be able to detect these tiny amounts of DNA and say that this pest was actually on that plant, even though we didn't see it. So there's a variety of methods that we can use. Some are more successful than others, but they're all really good.

Drew Radford: Tim, that sounds like crime scene investigation using DNA as analysis, but remarkable tools. What sort of success have you had using that kind of surveillance?

Tim Hurst: The targeted stuff, it's effective. But it's like looking for a needle in a haystack if I can use that analogy. And so I've determined that there's a needle in this haystack. Now, as I said before, I'm from the government, I'm a trained needle finder. I have some specialised equipment. I've considered everything that occurred on the day. The likelihood that the needle was thrown into the middle of the haystack or the edges, I've determined that it was thrown on the edges. I've got my special magnetic device. I've looked at the wind factor and the rain and the geology, and I've decided that the needle is more than likely going to be right in this area here. And that's where I'm going to look. And so I guess I'll ask you, what do you think my chances are of finding that needle?

Drew Radford: Not a lot. I would imagine.

Tim Hurst: Not a lot. I'm highly trained. I've got the right equipment, but at the end of the day, it's still a needle in a haystack. Now, whilst I've been looking, there's a crowd of people now around me having a bit of a laugh. And so I ask them, "Hey, you might not be highly trained as me, but why don't you come and give me a hand?" And suddenly I've got an extra 100 set of hands helping me look for this needle in a haystack. And I think you could agree, suddenly my chances have gone up. And this is what we refer to as general surveillance. So this is surveillance that it's not targeted at a pest, but it's still occurring anyway. And this is where your urban gardeners might come in. I said before, I like to potter around in my garden. Maybe I find something I haven't seen before and I report it.

 And if enough people do that, we might actually detect a pest that our own targeted surveillance hasn't picked up. Industries do the same thing. They employ crop scouts, agronomists. Now these are trained individuals to look for the pests that are here, but if they notice something unusual and report it, again, we've just increased our chances of successfully picking up a pest. And so it's that question of targeted surveillance can be very effective. We have the right training, we have the right tools, but we are still looking for a needle in a haystack. We've increased our chances by looking at the biology and looking at those high-risk areas. But we're still one department. We're still a few people. And so suddenly you've got five million extra pairs of eyes in Melbourne helping you out. Things really, really start to look a bit better.

Drew Radford: Tim, you describe that very, very well. I've actually seen you in a webinar, bring up some graphics on that, comparing the hit rate between target surveillance and general surveillance. And I was quite stark when you could see graphically the impact of urban gardeners contributing to that surveillance effort.

Tim Hurst: Yeah, absolutely. I think targeted surveillance is so, so important and it's the foundation of our programs. But as I said, it's just so difficult. We can't cover the entire of Victoria, but other people can. And when you look at what we call a detection, so a detection is when an exotic pest has been reported. The majority of our detections that get reported each year aren't necessarily from our targeted surveillance programs. They could come from an importer that sees a strange insect come out of their packaging. They could come from an urban gardener who just happens to have an interest in entomology and thinks this is something that I haven't seen before. These are generally where we get our detections. And so I can't highlight the importance of general surveillance, the urban gardener reporting enough, it fills a gap that is very, very much needed.

Drew Radford: Well, Tim, the question is then how can urban gardeners and the community help and also report?

Tim Hurst: Yeah, it's become so much easier. And I think since we've realised that general surveillance really does fill that gap and is so important, there's now a number of tools for the urban gardener to report anything unusual. Don't be afraid if you don't know what it is and you think it's something new, then by all means report it. Nationally, there's a Plant Pest Hotline. So the number is 1800 084 881. So that will just basically automatically go to your local state, and you can actually report that online as well. So if you went onto the Agriculture Victoria website and just typed in Plant Pest Hotline, it'll also give you a form. The benefit of the form is you might be able to take a photo. Everyone's got a smartphone these days, taking a photo helps us out immensely.

 And everyone loves an app. And so there's now an app called MyPestGuide. And in particular, MyPestGuide Reporter is what you'd want to download. And it's a similar system. You see something, you open the app, you enter in the details, it geo locates you. So it tells us exactly where the sample was taken. You take a photo, you put in some basic details and submit it, and we will receive that. And we can do an initial look and say, you know what? That could be something of concern, we need to come out and have a better look at that. So, some really, really useful tools that people can use these days and are of great benefit to us as well.

Drew Radford: Tim, that's all sound fantastic and the public's involvement in using those tools sounds quite paramount to say the least. Tim Hurst, Senior Officer Plant Surveillance, Design and Analysis with Agriculture Victoria. Thank you for joining me in the Urban Plant Health Network studio.

Tim Hurst: No, thank you. And thanks to everyone who starts reporting.

Speaker 1: Thank you for listening to the Good, the Bad and the Bug-ly. For more episodes in this series, find us and subscribe wherever you get your podcasts. We would love to hear your feedback. So please leave a comment or rating and share this series with your friends and family. All information is accurate at the time of release. This podcast was developed for the Urban Plant Health Network.