Speaker 1:

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

Drew Radford:

As an adult, the spotted lanternfly is striking to look at. A kaleidoscope of red, yellow, brown, white, and black. It's also an insect that would do significant damage if introduced to Australia. Recently, that happened in the United States, and it's now spreading up their Eastern coastal states, damaging crops and native species, as it goes. This high-priority pest is currently exotic to Australia and considerable efforts have been undertaken to ensure it remains that way. G’Day, I'm Drew Radford, and to find out more about this pest I'm joined in the Urban Plant Health Network studio by Olivia Reynolds from Cesar Australia. Olivia, thanks for your time.

Olivia Reynolds:

Thank you, Drew.

Drew Radford:

Olivia, I've seen pictures of it, but what is the spotted lanternfly?

Olivia Reynolds:

So, the spotted lanternfly, the scientific name is *Lycorma delicatula*, is an exotic hemiptera, a planthopper and it's in the family Fulgoridae and it's considered a significant ecological and economic threat to forest and agriculture. This pest is actually a native of China, Vietnam, and also India, and thankfully it's not currently present in Australia, but it is of increasing biosecurity concern due to its recent spread and invasion in South Korea and Japan, and also more recently the USA. It's interesting to note that we have about 24 species, or named species, from the same family, Fulgoridae that are native to Australia, however, none of these are considered significant pests.

Drew Radford:

Olivia, so the good news is that it's not in Australia yet, but this series is about encouraging people to keep an eye out for potential incursions. So, what are they looking for in terms of this bug?

Olivia Reynolds:

Yeah, so the spotted lanternfly is a hemimetabolous insect, meaning that it has no pupal, or cocoon stage, as we see in, for example, butterflies and moths. However, it has three distinct stages, the egg and the nymph and the adult. Eggs are typically laid in clutches or groups of about 30 or 50. And they're covered in a secretion by the female, giving them the appearance of a clay splotch. Eggs can be laid on a range of surfaces from trees to rusted fence posts, garden furniture, and even vehicles, meaning that they can inadvertently be transported. Eggs are typically laid in the Autumn and they actually enter a diapause or a type of hibernation over winter, and it's not until spring when the nymphs actually emerge. These nymphs have four growth stages or instars. The first three instars are black with white spots, so reasonably conspicuous and they increase in size through those three instars from about 3.5mm up till about 15mm when they reach the fourth instar.

Now, when the fourth instar is reached the spotted lanternfly becomes very colorful, turning predominantly a red color with white and black markings. The legs, however, remain black and white throughout all the instars and the nymphs spend about 20 days in each instar. After that fourth instar, the adults then emerge and adults range in size from about 21 to about 27 millimeters, with females typically larger in size. The body of the insect is yellow in the adult, and it's partly divided with some black bands and when closed their full wing or the outer or visible wing has a distinctive spotted pattern at its anterior end with a linear pattern at its tip and the hind wing or the wing that's underneath that outer wing, or external wing, is partially red with black spots, nearest the insects body.

With a black and white patterning toward the tip of the wing. The lanternfly actually displays the red part of their wing as a warning to potential predators, not to eat me, I taste bad, when it's threatened or disturbed. The reason these insects actually taste so awful to predators is that they acquire chemical defenses from their host plants, predominantly the tree of heaven, and thus, when they're ingested or pecked upon by a bird, it's a bit of a repellent for that predator. Adults are around for about four months of the year. So, they're also a univoltine species, meaning that they only actually have one generation per year.

Drew Radford:

Olivia, you described that really, really well. It's exceptionally colorful. To me, it would stand out because I haven't seen anything that looks like it in my garden or do the native versions of it, look a little bit similar or is it quite different in that regard?

Olivia Reynolds:

Drew it is quite different. It is very conspicuous and it's actually thought by a lot of people to be quite a pretty insect. Some people looking at it might actually think it's some sort of moth or butterfly with the colorations that you see. Yes, it is a lovely insect. Unfortunately, it's a very damaging pest of significant biosecurity concern to all invaded countries.

Drew Radford:

You mentioned earlier, it acquires it's nasty taste from a plant, which is known as tree of heaven, I understand, that's an invasive species as well, isn't it? So, what's the plant look like and what do the people need to be on the lookout for?

Olivia Reynolds:

Tree of heaven, scientific name is *Ailanthus altissima* is the spotted lanternfly's preferred host plant. The tree of heaven is not native to Australia, but it is widely naturalized throughout the coastal and sub-coastal regions of South Eastern Australia. Importantly, it is regarded as an environmental weed in New South Wales, the ACT, Victoria, South Australia, Queensland, and also Western Australia. It's particularly invasive and readily escapes cultivation into areas such as disturbed forests, roadsides, vacant areas. It's interesting to note that some recent research has actually shown that in the absence of the tree of heaven, while the spotted lanternfly survival is not impacted, development of the insect actually takes longer, and the number of egg masses produced by the adults are fewer. It just demonstrates what an important host tree of heaven is to the spotted lanternfly.

Drew Radford:

Olivia, what sort of damage does the spotted lanternfly do to plants? Why do we need to be concerned about it?

Olivia Reynolds:

So the spotted lantern fly feeds on plants using its piercing, sucking mouth parts, so it inserts its stylet into the phloem tissue causing oozing wounds on trunks and branches of trees. This can result in wilting or death of plants under high pest populations. Large amounts of honeydew are excreted by the spotted lanternfly and this is deposited on the host trees and the surrounding understories during feeding. This actually leads to the promotion of the growth of sooty mould and this hinders plant photosynthesis and contaminates agricultural and forest crops and concerningly, this mould contaminated crops are deemed unmarketable. This honeydew also attracts nuisance pests, such as ants and wasps, and can be very problematic for residents.

Drew Radford:

So obviously it's not going to be a great thing for agriculture if it gets into Australia, what sort of chaos has a created overseas?

Olivia Reynolds:

So in it's invasive range, for example, in Korea, it's actually caused significant damage in vineyards. In the US, in a vineyard at the core of the original infestation, a 90% yield loss was reported unfortunately, and also soon after the invasion, the most heavily fed upon vines in this particular vineyard didn't survive winter temperatures and in the following spring, none of the surviving vines actually set fruit. Other vineyards in the area also reported mortality of vines and yield reduction. We also saw that spray records from several vineyards indicated that the number of insecticide applications increased significantly as a result of spotted lanternfly. It has caused some quite significant damage, particularly in vineyards. At this stage the US has not seen what appears to be economic damage in fruit crops, other than those vineyards, but it's still a relatively early invasion and the US have a lot of quarantines in place and are seeking to manage it as best they can.

There's a considerable amount of research currently going on in particular in the US and also parts of Asia, to look at a range of aspects of the spotted lanternfly, including pest management. In Australia, similar to the US, the pest is expected to be a threat to the nursery, fruits, landscape, and hardwood industries. Impacts can also be expected on the livelihoods of local producers and businesses, and indeed the quality of life of the residents as it is a nuisance pest on people's properties, typically congregating on woodpiles, garden furniture, fence posts, and other inanimate objects. It is potentially going to cause a range of issues, some possibly unforeseen, but some are being experienced internationally in its invasive range.

Drew Radford:

Olivia it sounds like a horrible pest in many regards, particularly so for vineyards and a range of other areas as well. How can urban gardeners help with protecting Victoria from this bug?

Olivia Reynolds:

So, if urban gardeners see this pest, they should immediately report it by calling the exotic plant pest hotline, and that will direct them to their appropriate state department of agriculture. If they're involved in a biosecurity blitz to detect this pest, they can certainly download, if they don't already have, the MyPestGuide reporter app and report any suspect detections.

Drew Radford:

Olivia Reynolds from Cesar Australia. A lot there to consider for urban gardeners to keep an eye out for this particularly horrible bug. Thank you for joining me in the Urban Plant Health Network studio.

Olivia Reynolds:

Thanks very much Drew, I hope that's useful to all your listeners.

Speaker 3:

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