Speaker 1:

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

Drew Radford:

They might look fluffy and cute, but the large earth bumblebee is actually an incredibly invasive species of bee. G’Day, I’m Drew Radford, and although they don't pose a significant health concern, it's likely that they will put pressure on native flora, outcompete with honeybees and native bees for pollen, and it's even thought that they may enhance the spread of some weed species. Joining us in the Urban Plant Health Network studio to explain why these cute bees are not as cute as they seem is Agriculture Victoria invasive species analyst, Michael Whitehead. Thanks for your time.

Michael Whitehead:

Hi, Drew. Thanks for having me.

Drew Radford:

Michael, can you tell me specifically what a bumblebee is and what makes them different from other bees?

Michael Whitehead:

When we say bumblebee, we're actually referring to about 250 species of bees that are mostly distributed throughout the Northern Hemisphere. So this diversity of bees is mostly found in North America, Europe, and Asia. What makes them distinctive is that they're usually covered in a thick coat of hairs. They're usually larger than most other kinds of bees. And these large size comes with characteristics like loud buzzing and a bumbling flight. But the bumblebee that we're talking about today specifically has the scientific name of *Bombus terrestris*. It has two common names, the buff-tailed bumblebee and the large earth bumblebee. So I think from now on, if I say bumblebee, it's safe to assume I'm speaking about this one species of bumblebee, *Bombus terrestris*.

Drew Radford:

Now we're talking about this one particular species though because they're already in Australia, but only in one part of Australia. Have I got that correct?

Michael Whitehead:

Yeah, that's right. They're only present in Tasmania.

Drew Radford:

And in terms of this particular bee, how can you easily identify it? It's obviously bigger, you've said that, but double the size of a normal bee? And you said it's fluffy, but has it got other markings?

Michael Whitehead:

Yeah. So these have a pale... The colour is called buff, which is an off-white sort of cream coloured patch right on the end of the bum. They're very fuzzy. They've also got an orange band across them a bit around the middle. They do range in size. So they range from about eight to 35 millimeters. And that's because you have queens on the upper end of that, which are probably one of the largest bees we have in Australia, and then the smaller ones are the other workers. So size is not the only characteristic you can use to identify them, but the thick coat of fuzz, the orange band on black and the loud buzzing is pretty unmistakable as far as bees go in Australia. There aren't many bees that approach that description.

Drew Radford:

In terms of being in Australia, I mentioned Tasmania. So they're currently there. Any idea how they ended up there?

Michael Whitehead:

We suspect they came from New Zealand actually. We don't know whether they were introduced accidentally or intentionally. Either of those scenarios is possible and we'll never know, but genetic work has shown that the Tasmanian bumblebees came from New Zealand. And we found them in 1992. They were first detected near Hobart. They were actually four species of bumblebees in New Zealand. They were also introduced to New Zealand and they were introduced in the late 1800s to 1900s to aid with pollination of clover. And so bumblebees now have distributed all over New Zealand, four species of them. So we got our bumblebee from somewhere in New Zealand. And originally, this species though, this particular lineage of *Bombus terrestris* is from the UK. So they were brought from the UK to the New Zealand and then from New Zealand to Tassie.

Drew Radford:

You mentioned in New Zealand that they were brought in for the clover industry. Why don't we want them here?

Michael Whitehead:

Well, we have a beautiful diversity of native bees and native plants that we're a bit worried will be disturbed by the introduction of a very robust generalist pollinator. So the bumblebee is an amazingly adaptable and strong forager for nectar and pollen and we are worried about the impacts that the bumblebee might have on native plants and native bees.

Drew Radford:

Indeed, I read a study that showed that there was a native bee decline in Tasmania.

Michael Whitehead:

Yes, this is pretty understudied I have to say. There are only a handful of papers that have actually looked specifically at this issue and we certainly need more work in that area. But one of those studies was a correlative study looking at the activity of one particular native bee species. This is a *megachilidae* or a leaf-cutter bee. It found that in areas where bumblebees were active in Tasmania, this native bee was a lot less active. So, this suggests to us that in the presence of bumblebees, this native bee is being at least somewhat outcompeted.

Drew Radford:

Okay. So that's the insect. What about birds or other animals? Are there impacts in those areas?

Michael Whitehead:

Yep. So even among the insects, actually, there are some other examples. There was an Israeli study that found lower native bee diversity in the presence of *Bombus terrestris*. And we also have some concern that managed honeybees, the apiary industry might have an impact from bumblebees. And this is because bumblebees can get up earlier in the morning, they can forage at cooler conditions. They can forage in wetter conditions. And so it's possible that the nectar resources in the environment are partially depleted by the time that the managed European honeybees get up and out of the hive. So there's less nectar available for those bees.

Michael Whitehead:

And this also flows to native birds. So we've got beautiful diversity of honey eaters and nectarivorous birds. And one of those is the swift parrot, a nectarivorous parrot that's on the endangered list. We have an example of a study that looked at the key eucalypts species for this swift parrot and the nectar resources provided by that species and found that the competition from bumblebees drastically reduced the nectar available in these eucalypts in swift parrot nesting sites. And we can quite reasonably assume that having a lot less nectar available to these birds is likely to have flow on impacts to their reproductive output.

Drew Radford:

Is there any correlation between bumblebees and the potential to spread invasive plant pests as well? Are there weeds and stuff that they prefer which they would help spread?

Michael Whitehead:

Bumblebees are generalists. They love to forage from a wide range of flowers, but they also have co-evolved with some flowers in the Northern Hemisphere. So we have some specific species that are introduced to Australia that have adapted to be pollinated quite well by bumblebees. So we are concerned that these introduced plants that have co-evolved might currently be in low densities and could possibly spread a lot wider once we get bumblebees into the mainland. So this is the concept of the sleeper weed where you have a weed that doesn't really get noticed yet, but once the bumblebee is around, we have its preferred and most efficient pollinator all of a sudden producing masses more seed than it could have without the presence of the bumblebee. Some examples of these are things like agapanthus, foxglove, lupin. These flowers are very well pollinated by bumblebees, but not much else in Australia just yet.

Drew Radford:

Michael, it sounds like we're way better off without them. Have they been detected on the mainland?

Michael Whitehead:

We do have occasional incursions of bumblebees on the mainland. So 2003, somehow we ended up with two detections of bumblebees in Australia. There was one in Melbourne at Appleton Dock. There was a single worker found. And so it probably came over from New Zealand in a cargo shipping container. After a few days of survey, we didn't find any more bees, but also, as I said, that same year, we had another detection on Fisherman Island up near Brisbane. A live worker was foraging on flowers there and we found no follow up colonies. So luckily if it's just a worker that comes over, they're unable to establish a new nest. So that's probably what's going on there.

Michael Whitehead:

But more recently, in 2020, there was a dead bumblebee discovered on a balcony of an apartment close to Melbourne CBD and Agriculture Victoria has followed up on that with surveys for more bumblebees and we haven't found any more live bees since then. So, again, we hope it was probably just a worker brought home in someone's camping gear and died in their apartment rather than a worker that's born in a colony living in Melbourne. So we certainly do have a sporadic trickle of incursions and it's just a matter of time before the next one's going to show up I think.

Drew Radford:

I'm getting the impression the main pathway is via ports attached to cargo or people's baggage.

Michael Whitehead:

Yeah, we think that the most likely entry points will be cargo from New Zealand and Tasmania. And this could be via air or sea. The other main risk pathway is the spirit of Tasmania, people bringing their camper vans back and their luggage back potentially with a bee inside. And we do have to have a queen come in in order to establish a colony. And most bees in the environment are workers. So we have that on our side. It's probably just a matter of time until we do, unfortunately, get a queen over here. So it's really important for people to be aware of the issue and if they see a bumblebee to be proactive about reporting it.

Drew Radford:

And how can people be proactive, Michael?

Michael Whitehead:

The best thing to do is to get some evidence for us if you think you've seen a bumblebee. It's not always possible of course, but if you can, get the phone out in time while it's still working, then get video if you can because video's often better for the purposes of identification than a blurry photograph. So try to get us a video. If possible, you can try to catch the bee. Now, they do sting. So be careful. The sting is not particularly worse than a honeybee, I've been led to believe, but most bees you can easily catch while they're actually busy on a flower. So if you follow the bee around, wait till it lands to be foraging and then gently place a jar or a net over it. They're not too hard to catch.

Michael Whitehead:

Whether or not you've caught the bee or got a video, even if you've only just got a good sighting to go on, we still want to hear about it and you need to contact the Exotic Plant Pest hotline, which is 1800-084-881, or you can contact Agriculture Victoria through its reporting lines. And if you just Google Agriculture Victoria bumblebee, you'll find a nice page that's been put together with the links to reporting online or the phone numbers to let us know that you've seen a bumblebee.

Drew Radford:

Michael, thank you for all the work that you're doing and your team and trying to keep these out of the country. It sounds like we can well and truly do without them. Michael Whitehead, Agriculture Victoria invasive species analyst. Thank you for joining us for this Urban Plant Health Network podcast.

Michael Whitehead:

Thanks very much, Drew. Great to speak to you.

Speaker 1:

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