# GRDC PODCAST TRANSCRIPT

**RE-THINKING MANAGEMENT OPTIONS FOR REDLEGGED EARTH MITE**

[00:00:05] **Intro** This is a GRDC podcast.

[00:00:12] **Deborah Bishop** Growers across large areas of Western Australia and parts of south eastern Australia, will be very familiar with the destructive and costly pest, the redlegged earth mite. But the repeated use of limited chemical options, for redlegged earth mite, has resulted in resistance issues, signalling a need to change the way insecticides are used, to reduce the risk of further resistance. Hello, I'm Deborah Bishop. In grain and pasture regions affected by this pest, resistant surveillance and development of up-to-date management recommendations are helping to maintain effectiveness of current chemical control options. As part of this approach, social benchmarking, featuring tailored local relevance, is being used to identify current knowledge, motives, and attitudes towards insecticide resistance, with an intent to reduce reliance on insecticides while rethinking our management options and strategies around managing this pest into the future. I spoke with Dr. Lizzy Lowe, a scientist with independent research company Cesar Australia, about how these insights are being applied to ensure management recommendations are applicable, practical and achievable for growers into the future.

[00:01:28] **Intro** Yes, so the red legged earth mite is a project that's an investment of the GRDC, which is a collaboration between Cesar Australia, which is a company down in Melbourne where I'm from, and the University of Melbourne and deeper here in Western Australia, and it's focusing on working out where red legged. This mine has resistance across southern Australia and what we can do about it. So working at how people are currently managing this pest and how we can improve the management of it, to increase sustainability.

[00:01:55] **Deborah Bishop** Where in Australia are we seeing red legged earth mite and the resistance coming up more than anywhere else?

[00:02:01] **Dr Lizzy Lowe - Cesar Australia** Yeah, so this is a southern grains pest, we find it all the way across the southern grain growing region in Western Australia, South Australia and all the way up to kind of mid New South Wales. But we don't have resistance widespread yet. So resistance first was discovered in Western Australia in 2006, so that was resistance to synthetic pyrethroids and since then we've found resistance to organophosphates as well, in Western Australia that was first discovered in about 2014. And every year that we've done surveillance since then we've seen more and more resistance, so it's now quite widespread in southwest and Western Australia. We're now seeing it in South Australia as well, down the Fleurieu Peninsula and even onto Kangaroo Island and now detected the first case of organophosphate resistance in Victoria as well. And we're seeing reduced sensitivity to these pesticides across the board. So it really is a growing problem in the Southern Grains region.

[00:02:53] **Deborah Bishop** What actually drew the attention of GRDC to the problem of redlegged earth mine and how did we start to hear that it was becoming a problem?

[00:03:00] **Dr Lizzy Lowe - Cesar Australia** Yeah, that's a great question, it was actually from the growers, so we had some very astute growers who were down in southwestern Australia, who noticed that the chemical applications that they were putting on their crops, weren't having the impact that they wanted to when it came to redlegged earth mite. And it can be a really significant pest in Western Australia in particular, we see huge losses related to this pest. So they were applying chemical applications, they weren't having the results that they wanted to, and so they actually called off the DPIRD team and said, you know what's going on here? And that's the way that they found that first case of resistance.

[00:03:31] **Deborah Bishop** Now you undertake surveillance. Take us through what that involves? Covert surveillance this sounds a bit intriguing.

[00:03:37] **Dr Lizzy Lowe - Cesar Australia** Yes, it is, isn't it? Well, we do a couple of different ways for surveillance. A lot of it is targeted, so as I explained, when the farmer is noticing a problem, they can come to us. And all the Western Australian surveillance is done by DPIRD, so they would alert the DPIRD team to a case of resistance or suspected resistance. They would go out there and test it. We also do targeted testing along roadsides and along strips across the country just to kind of get an idea of where it is. But we do also collect samples from farmers, so if we can't get out to a region and we think there might be resistance, they can actually send the mites to us, to our lab in Victoria where Cesar Australia is and we can do the resistance testing there on site and that's a free service too, so that's a nice reminder to everyone is if you do end up having problems with resistance in redlegged earth mite this year give us a call, we'll be able to help you out as well.

[00:04:26] **Deborah Bishop** Excellent. You'll be getting a few calls, no doubt. Now, you mentioned that social benchmarking was also used as part of this project. What actually is that and how’s it helped?

[00:04:35] **Dr Lizzy Lowe - Cesar Australia** Yeah, we're really strong believer of aligning all of our research with extension and this is a really good example of where it's so important. The reason that resistance has evolved so many times independently across the country is basically down to management decisions on an individual level. It's not like another pest where you would have aphids and they have resistance, and they fly into an area and someone else's fault. This really does happen at an individual farm level and it's because of the continual spray of the insecticides they're using. So this means that individual management decisions have a real impact on the evolution of resistance. So what we wanted to do, is not just throw research at people, we don't want to just keep on telling them the genetics or the molecular kind of background to this resistance. We want to get out there, we want to talk to them, we want to understand why they are using these practices, even if they do have an understanding or working out where any knowledge gaps are that we could help fill with our extension resources that would then give them the information that they need to manage this into the future. So this is the knowledge benchmarking. We go out there, we work out what people are doing, how they feel about it, what their knowledge is, and that's our benchmark. And we use that to start building up that knowledge in different communities, we make resources that are locally relevant and then we really address the local concerns of people to help change that practice over time.

[00:05:55] **Deborah Bishop** So growers actually able to keep redlegged earth mite under control with minimum insecticides. Is that what you're suggesting?

[00:06:02] **Dr Lizzy Lowe - Cesar Australia** We definitely would love to see more management practice moving away from the use of insecticides, yes, that's exactly what we're suggesting. And the ways that they can do this are all outlined in a really useful document called the 'Resistance Management Strategy for Redlegged Earth Mite' and this is held on the GRDC website. It's a really good resource. But one of the things we realised through our benchmarking was that not a lot of people knew about this resource and a lot of people didn't even realise that there is resistance to synthetic pyrethroids and organophosphates in the areas where they're growing. So a real focus for us now is to let people know where that resistance is, but also let them know the strategies they can use. And another way we had to do that was these demonstration sites that we've had in Victoria. So we go out there, we've got a couple of different sites and we basically use IPM strategies within those sites and look at what the impact is. And in this case IPM Strategies is basically just not spraying. And we found that although redlegged earth mite numbers did increase in the sites that we didn't spray, they were nowhere near the threshold numbers. So this is kind of just a little demonstration that if you do hold off and not put that proactive spray on the redlegged earth mite at the first sign of them, that you can actually keep numbers low without spraying, which means that you don't end up with that increased risk of resistance and you're also protecting the beneficial insects which are in your fields as well, which are going to contribute to pest management across the board.

[00:07:25] **Deborah Bishop** So just talking about those beneficial insects, just take us through the problems that redlegged earth mite can actually bring for growers. What is their problem?

[00:07:34] **Dr Lizzy Lowe - Cesar Australia** Yeah, so the redlegged earth might bring problems when they reach very high numbers, they clump in little groups and they make a particular damage, especially on establishing crops. It looks almost like frost damage. It kind of silvers the leaves and it can cause the leaves to cup up, so when they are in very high numbers, then you see yield losses and loss of crops at establishment.

[00:07:54] **Deborah Bishop** But I mean the ingrained response is to take the reaction rather than being proactive, I suppose. So how do you encourage growers to take that step back and not do the practice, the habit that they've been in?

[00:08:07] **Dr Lizzy Lowe - Cesar Australia** They're actually some really good tools out there for growers to use, to support their redlegged earth mite management and this is all about understanding the risk of them having a problem the next year and really, really targeting where they have their control. So to understand the risk, there is a risk management tool again on the GRDC website where they can plug in some information about their crop history, their paddock history, and it will tell them what their likely risk is for the next year. If they do have a very high risk, they can start thinking about proactive management at the end of the season because redlegged earth mite have a really weird life cycle, in which at a certain time, at the very end of the season, the females will actually take all their eggs inside them, that will die and then they'll go underground and they stay underground with the live eggs inside them over all of summer and then they hatch out over again about at establishment time in autumn the next year. And so, if you can actually hit that population before the females go underground, then you've got a much better chance of having low numbers the next year. And what Cesar to have developed along with our partners, is an updated time right tool and this tool helps you decide when that time point is, in which these mites are going to go underground and really target that spray before they do. And we've got a newer version of that coming out which gives a better approximation of the time scales there. And there is one final tool which is at the other end of the lifecycle where they're hatching out. A really important part of redlegged earth mite management is monitoring, knowing when they're coming out, how many they're going to be and whether they're reaching that threshold level or not. So this hatch timing tool, you plug in your location, it uses your local weather data to give you an estimate of when the eggs are going to hatch out in your local area, which means you can start looking in your fields to see where they're going to be hatching out and you can start that monitoring process. So it's all just about being really aware of what the lifecycle is doing when they're likely to be in the fields and when you can start making those decisions about whether that control is going to be appropriate or not, or whether you can actually hold off this year, not spray and then actually protect against the resistance occurring.

[00:10:13] **Deborah Bishop** So is the problem and the response similar across the regions that are affected? Or is it a region by region specific approach?

[00:10:21] **Dr Lizzy Lowe - Cesar Australia** That's a good question. We are definitely seeing a higher level of resistance in Western Australia. This is where it evolved and this is where we're seeing ongoing new cases of resistance every single year, but it's definitely not isolated to Western Australia, as I said before, you know, we're seeing new cases of resistance popping up across southern Australia and now into Victoria as well. So it does come down to individual management practice. But I think that communities in different areas have a different approach to the pest management in some areas and this is leading to higher cases of resistance.

[00:10:54] **Deborah Bishop** What would your takeaway be for growers today or for those who are experiencing the problem and have tried to smash it with insecticides previously? What is the takeaway here for those of our listeners today?

[00:11:06] **Dr Lizzy Lowe - Cesar Australia** I think the takeaway is that the redlegged earth mite is a really hard pest to manage and we are quite limited in the chemicals we have available. You know, synthetic pyrethroids, organophosphates and neonicotinoids are basically the three chemicals that are used. And if we're seeing a reduction in the efficacy of two of those chemicals already and it's likely that we would see resistance to neonicotinoids in the future as well, we're really reducing the options we have as an industry to deal with this pest into the future. And this is why using an integrated pest management approach of only spraying when it's absolutely necessary becomes vital. We really wanting to make sure we have these chemicals to rely on into the future and that we don't lose the way that they impact these pests.

[00:11:46] **Deborah Bishop** So where to from here?

[00:11:48] **Dr Lizzy Lowe - Cesar Australia** So this research collaboration, which is funded by the GRDC with DPIRD and the University of Melbourne, will be continuing on for the next year. We will be continuing with our IPM demonstration sites, looking at the impact on canola, and we'll also be doing our surveillance across southern Australia to keep people updated and developing some really targeted extension materials which address the knowledge gaps we've identified and really working with those local communities to give them the information that they need.

[00:12:14] **Deborah Bishop** And hold off on that insecticide in the level that we have been used to?

[00:12:18] **Dr Lizzy Lowe - Cesar Australia** Absolutely. And if you need more information on the redlegged earth mite, we have the information here for you. The DPIRD team in Western Australia do an absolutely fantastic job and the team with Cesar have all the information that we need for resistance management as well.

[00:12:31] **Deborah Bishop** Lizzy, thanks so much for talking to us.

[00:12:33] **Dr Lizzy Lowe - Cesar Australia** Yeah, thank you.

[00:12:40] **Deborah Bishop** We've been listening to Dr. Lizzy Lowe from independent research company Cesar Australia. And as Lizzy mentioned, more information can be found by heading to the GRDC website. I'm Deborah Bishop and thanks for listening.