# GRDC PODCAST TRANSCRIPT

**SURVEILLANCE, FLIES AND SNAILS: NEW TECHNOLOGIES FOR SNAIL MONITORING AND CONTROL**

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

[00:00:12] **Shannon Beattie** Research into snails over the past decade has largely focussed on baiting. And while a lot has been learned, baiting is only one part of an effective integrated management strategy for snails. That's why a new national GRDC investment is tackling the snail problem from multiple angles, by combining technology and biological research to inform control management. The project is being led by the University of Adelaide and the South Australian Research and Development Institute, or SARDI, and involves setting up cameras in paddocks to track snail movements and migration habits, while for biological control, a parasitoid fly has been released in WA for the first time to help suppress conical snails. Hi, I'm Shannon Beattie and I sat down with Sterlings to Coast Farmers Chief Executive Officer Lizzie von Perger and project lead Dr Kym Perry from the University of Adelaide, who starts us off by explaining the issue with snails across the country.

[00:01:04] **Dr Kym Perry** Snails are one of the main pest management challenges facing Australian growers. They damage crops at establishment. They cause contamination at harvest time because in spring they like to climb into the crop plants and they're generally a nuisance around the harvest and it's certainly a year round problem for many growers.

[00:01:21] **Shannon Beattie** And how about yourself, Lizzie? Specifically, here on the south coast of Western Australia. What issues are growers in this region facing?

[00:01:29] **Lizzie von Perger** Much the same issues as Kym just mentioned then certainly when farmers are seeding their crops and the crops are starting to emerge from the ground, snails can be a massive problem, particularly in canola crops and then, yeah, like Kym said it at harvest as well we do see contamination of our grain due to snails.

[00:01:48] **Shannon Beattie** Let's cast our minds backwards a little bit and talk about the past. Kym, what research has been done in this space over the past, I don't know, 10, 15, 20 years to help growers with snail management.

[00:02:00] **Dr Kym Perry** There's been a lot of investment in snail research over that time frame from GRDC and other funders. A lot of the focus has been on how to get the most out of snail bites, because farmers are spending a lot of money putting their baits out every autumn, and we know that we've got to get the timing right to make sure that we're killing snails before they breed, and we've got to put the bait out when they're moving and feeding. So, there's complex interactions between what's going on in the environment and in the way that snails behave.

[00:02:26] **Shannon Beattie** And what's the difference with this project then, that SARDI is working on with a whole bunch of partners? How is this project different to what's been done in the past?

[00:02:34] **Dr Kym Perry** I think we've learned a lot about baiting, so there's probably not a lot of benefit in focusing too much more on that in the near future. Instead, we're looking at developing new monitoring technologies, taking advantage of AI Vision and some new engineering solutions, and also building on the biological knowledge. There's always knowledge gaps around understanding how these animals behave and we are trying to, I guess, find the vulnerabilities in the way they behave so that we can target those for management. But certainly, it's a multi-faceted research program with a lot of partners in it, and we're trying a whole lot of different things and hopefully some of these things show promise, and we can take them forward and make them into new tools for growers.

[00:03:15] **Shannon Beattie** And Lizzie, why was this project something that Stirlings to Coast Farmers wanted to be involved in, and how did you get involved in the first place?

[00:03:22] **Lizzie von Perger** Yeah, look, being a national project, we were really keen to target some of the snail types that we have in WA. So it was really important that we could get some of the cameras installed on this side of the country and see how some of those technologies integrate with the snail types we have on the south coast.

[00:03:38] **Shannon Beattie** Lizzie just mentioned cameras. Can you tell us, Kym, what it is you're actually doing with cameras as part of this project?

[00:03:44] **Dr Kym Perry** So in recent years, we've been using cameras to understand more about when snails are on the move and trying to understand the environmental triggers for that movement. This project takes that one step further we're now building automated Sentinel stations that will monitor snail movement and then provide growers alerts in real time on when the snails start to move at the end of their summer dormancy, so that we can really nail that bait timing. And so for the first time, we've had a local company, Data Effects, build what we're calling S-3 Sentinel units. Three of those are being installed in Western Australia, two in the Albany region and one near Esperance, and there'll be three in South Australia. And the first phase of this has been to get the technology up and working. So these units are going to automatically monitor snail movement and process the footage using cloud based infrastructure and provide alerts to farmers, so this is the first attempt at doing that. And as part of it, we're working closely together with Stirlings to Coast Farmers in the Albany region and the SEPWA group in Esperance.

[00:04:44] **Shannon Beattie** Now, my understanding is that eventually this footage that these cameras are capturing will be, I guess, analysed by AI but in the first instance, the footage is going to have to be combed through. Lizzie, what poor sod at Stirlings to Coast Farmers has been given that job of combing through all the footage.

[00:05:00] **Lizzie von Perger** Our lovely project administrator, Trish Garnett, will have that awesome privilege and yeah, she's pretty excited to be part of the project too coming from a farming background came.

[00:05:11] **Shannon Beattie** Talk about AI, how, is that technology going to work and I guess how far are we from hopefully having some AI, as part of this project to analyse that footage?

[00:05:20] **Dr Kym Perry** AI has already been built really for snail detection in the last few years. As part of this project, we're trying to improve the AI vision that we've already got going to try and take advantage of aspects of the snail shell and how we can get better contrast with the ground. The problem is with small pointed snails in particular, detection is not very accurate. They're very challenging targets and so it's a complex AI problem to try and solve and improve, which is what we're trying to do in this project. So, we've got the Australian Institute of Machine Learning working on that, as you mentioned, it's not quite ready yet to be fully automated and so we've still got humans monitoring the footage, but that will be up and running within the next 12 months I would imagine.

[00:06:01] **Shannon Beattie** Let's move on to the second part of the project, which is about flies. Should we be concerned at all about releasing strange flies into the environment here in Western Australia and indeed in South Australia as well?

[00:06:14] **Dr Kym Perry** There are strict rules about introducing foreign insects into a country for bio control. The fly we're introducing is Sarcophaga villeneuveana, it's a species that was first introduced into South Australia 20 years ago. It's originally sourced from the Montpellier region in France, and at the time, the fly went through strict quarantine and host specificity testing to make sure that it was specific and did not attack native species, and that species was cleared for release 20 years ago. It's now on the approved list for release in Western Australia, and hence we're releasing it over here for control of small pointed snail.

[00:06:53] **Shannon Beattie** How does this whole fly thing actually work? How on earth do you use a fly to control a snail?

[00:07:01] **Dr Kym Perry** So these flies are parasitoids, the female flies lay a live grub on the outside of the shell of a resting snail anytime between spring and summer, the grub crawls inside the shell and eats the snail, and then develops into another adult fly, which can emerge to attack more snails. So, these flies are not a pest in any other way. They eat snails, which is what we want.

[00:07:20] **Shannon Beattie** Lizzie, as Kym just mentioned, this has been going on in South Australia for 20 odd years. How exciting is it for growers in the south west of WA to have this sort of research happening in their area?

[00:07:31] **Lizzie von Perger** Yeah, look, it's super exciting. It's great that we were able to use the east coast as guinea pigs and refine the process. So we're pretty excited about the information that's been learnt on the east coast and then transferring it over here so that we're not essentially starting from scratch and we've got a bit more information around how these flies survive in our environment and hopefully we can foster some of that information to make sure that we get some good population growth on the West Coast.

[00:07:56] **Shannon Beattie** How do we go about that population growth Kym, when these slides are released, they just sit in one paddock do they move - how do we make sure that as many growers as possible are actually able to utilise this biological control.

[00:08:08] **Dr Kym Perry** Biological control is certainly a medium to longer term prospect. The goal of what we're doing at the moment is to get the fly locally established over here in Western Australia, and once there are local breeding populations, the fly will be able to passively spread itself around the landscape slowly over time, attacking more and more snails in more and more areas, which is what we want. Also, there's potential to set up local breeding programs over here in Western Australia, subject to appropriate funding, which is what we do in South Australia. We actually mass rear the fly in our labs at SARDI, and over the last few years we've been releasing in new areas where the fly wasn't previously present and that sort of thing will be possible in Western Australia once you've got local colonies over here. So it's very much establish the fly first and then hopefully get everything started and potentially some help from humans rearing up and doing some more releases.

[00:09:00] **Shannon Beattie** What are you hoping Lizzie your growers and growers in general, and the south coast are going to get from being a part of this project?

[00:09:07] **Lizzie von Perger** I really hope with having the flies released over here and having some more information around right baiting time, is that we can really get on top of control of the snails in our local environment along the south coast. It costs farmers a lot of money at the moment to control the snails, and just having a bit more information to arm farmers with, I guess more tools to control the snails is really essential.

[00:09:28] **Shannon Beattie** Kym, this is a team effort, can you tell us who actually is involved in this project across the country?

[00:09:34] **Dr Kym Perry** It's a project led nationally by SARDI and the University of Adelaide. We're working together with DPIRD in Western Australia, Stirlings to Coast Farmers, SEPWA, University of South Australia, CSIRO and a local company Data Effects who are building our camera units. So, it's a very collaborative project. We've got a lot of scientists on the project team who before this project had never actually seen snails, but they've got skills and technologies that we're putting to use on this very difficult problem. So, it's an incredibly exciting project team, and I have to say that being a national project, there's a lot of benefits in the exchange of knowledge that happens when we're talking with our colleagues in Western Australia, in South Australia. Everyone's experience of snails is a little bit different, and growers that have experience with snails just have such fantastic knowledge and insights that we try to learn from in the project. And I should mention, we also have an advisory group which meets every six months and includes growers from all over the country so they can hear what's going on and we can hear from their experiences, and I can tell us if we're on track or not. So, it's a great project.

[00:10:37] **Shannon Beattie** Lizzie, you've got some pretty great growers in the Sterlings to Coast Farmers group, and a few of them have graciously given up a paddock to have cameras installed and even, you know, have some flies released. What can you tell us about the growers who are a part of your group.

[00:10:50] **Lizzie von Perger** At Stirlings to Coast Farmers we're really lucky to have a really strong, engaged group of farmers that are really keen to see new technologies and new practices introduced where it looks to be beneficial to their farming systems. We never have a shortage of farmers willing to put up their hands to help out with projects such as these.

[00:11:06] **Shannon Beattie** Lizzie - Kym, thank you for joining me on the podcast.

[00:11:09] **Dr Kym Perry** You're welcome. Pleasure.

[00:11:10] **Lizzie von Perger** Thank you.

[00:11:17] **Shannon Beattie** That was Dr Kym Perry from SARDI and Lizzie von Perger from Stirlings to Coast Farmers, speaking about a new project looking at using surveillance and flies for snail management. More information on this topic can be found in the description box of this podcast or online at grdc.com.au. I'm Shannon Beattie and this has been a GRDC podcast. Thanks for listening.