# GRDC PODCAST TRANSCRIPT

**Subsurface drainage and the war on waterlogging**

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

[00:00:12] **Camilla Plunkett** Across Western Australia, growers have been dealing with an overall threat on farm productivity. Waterlogging. Many growers have looked into subsurface drainage to combat this problem and it's turning out to be a vital solution. Hello there. I'm Camilla Plunkett and in 2021 we brought you a podcast about the rising interest of subsurface drainage. Today, I'm in Dalyup on the south east coast of Western Australia, and I'm looking at how GRDC investment is proving its weight in water! Lead by South Coast Natural Resource Management, I caught up with project officer Sophie Willsher to talk about the subsurface drainage return on investment trial, what it is and how to do it.

[00:01:02] **Sophie Willsher - South Coast NRM** The subsurface drainage trial looks to investigate whether subsurface drainage is effective in alleviating waterlogging in crop paddocks and aims to help landholders make more informed management decisions around their water.

[00:01:14] **Camilla Plunkett** And the return on investment. What sort of things should growers consider when planning to install these drains?

[00:01:21] **Sophie Willsher - South Coast NRM** So the subsurface drainage return on investment trial aims to best inform growers on their surface and subsurface water management practices by providing a return on investment figure of subsurface drainage. To do this, we are looking at the crop yields, weed and disease presence, soil moisture content and biomass imagery throughout a course of four years to determine the yield benefits and therefore profitability of subsurface drainage.

[00:01:48] **Camilla Plunkett** So, we're here today at the trial site, where we are watching a grower install these drains. There are quite a lot of people here learning about it and watching the equipment they're using to implement it. Why do you think it's so popular?

[00:02:01] **Sophie Willsher - South Coast NRM** So the property we're on today is in Dalyup, which is west of Esperance. Like much of the Esperance region, Dalyup definitely suffers from Waterlogging, partly due to our sandy soils and high rainfall climate. So the subsurface drainage that's been installed historically on the property that we're here today on has really had a huge impact in alleviating waterlogging conditions in the trial paddock, which has improved our crop yields significantly to more than double.

[00:02:28] **Camilla Plunkett** What are the most important factors to consider when installing subsurface drainage?

[00:02:33] **Sophie Willsher - South Coast NRM** The most important factors to consider when installing subsurface drainage include your elevation of your property, the soil profile and your soil types. So when you install your drainage, the first thing you want to think about is your elevation of the paddock. Of course you want to work with your natural elevation. So accessing some online tools such as digital elevation models is a great way to go to just understand the natural fall in your paddock. From there you can think about your soil type and understanding what kinds of variation you have across paddock and at depth. So, soil type will influence a number of different factors with your drainage, including what spacing you choose for, how far apart your tile drains can go. So on a sandier soil you might choose for a wider spacing, whereas with clays where water can move less freely, you would choose to put them closer together. Another thing to think about is whether you choose to infill your tile drain with a sock or surrounded by aggregate. Both of these are viable options that support the drain in moving water through the paddock, but also can help to prevent blockages.

[00:03:39] **Camilla Plunkett** What are some of the mistakes people make when installing subsurface drains?

[00:03:43] **Sophie Willsher - South Coast NRM** I think one of the greatest mistakes is just not using all of the resources that are available to you. There are not only numerous online tools, information sheets and resources that you can access, including things like free mapping software, digital elevation models or water logging risk levels, but also the resources in terms of people around you to help you. Getting in touch with your local grower group, your natural resource management company, or even the regional hydrologist can make a huge difference in the effectiveness of your drains.

[00:04:15] **Camilla Plunkett** What are some of the outcomes of the trial so far?

[00:04:18] **Sophie Willsher - South Coast NRM** So far we have about three years into a four year trial and we've seen some great yield benefits just to date. I think one of the greatest benefits that's observed is when you walk through the paddock during September and can really see the difference in height and health of your crop between a drained and drained waterlogged site. The most important thing with subsurface drainage and any drainage is to do it properly. Designing your drainage properly really takes into consideration into your farm conditions. Think about your soil type and profile. Think about your elevation and think about the tools and resources available to you so that you're designing the best drains possible.

[00:04:56] **Camilla Plunkett** That was Sophie Willsher, from South Coast Natural Resource Management with her advice as project officer for the GRDC Subsurface Drainage trial. Next, I spoke with WA grower, Rohan Marold, who has had first hand experience in implementing these drains. I caught up with him to find out the impact it's had on his property.

[00:05:19] **Rohan Marold - Grower** So once we got this interest in the subsurface drainage, we found out about this GRDC project to look at how the impacts of the subsurface drainage into the crop production and also the effects on nutrients and water flows and putting a bit of science behind it. So we got involved with that and we're very interested to see the results of those case studies. So we farm about 2200 hectares and we have about 500 hectares of that for our sheep, pasture that gets rotated around in the cropping phase. We do canola, wheat and faba beans. As far as soil types, probably one third would be red river soils and clays and other third would be shallow duplex soils. And then we probably have a third that is deeper sands. We're finding those in between soil types, those shallow sand plane, waterlogging is a significant factor for the crops. So we've been looking at all sorts of ways to minimise that waterlogging and we've come across these tile ploughs from the US and we've been having a bit of a play around with that over the last three years and we're finding that those 60 centimeters of sand over clay seem to be perfectly suited to the use of that machine.

[00:06:39] **Camilla Plunkett** How has it addressed the waterlogging on your property?

[00:06:41] **Rohan Marold - Grower** On those particular soil types? The waterlogging has been nearly eliminated, so that's been a major bonus for us because it gives you confidence to put the right agronomy into those crops. And we have 600 mm rainfall and so we have plenty of potential to grow good crops, but the waterlogging is one thing that reduces your confidence.

[00:07:02] **Camilla Plunkett** What are the main benefits of the trials for you?

[00:07:05] **Rohan Marold - Grower** The main benefit is the impact on the waterlogging and waterlogging is a major impediment to our crop growth. It impacts on the root zone of the plant, reduces the rooting depth. It affects our traffic ability on the paddocks as far as getting onto the paddocks when we want to and do the jobs that we need to do. And it also has off side impacts when we get water that's running across the top of the soil profile and that causes erosion and takes away our sediment and our nutrition. So we're always looking at ways we can reduce it and this GRDC project is putting a bit of science behind all of that, so that's really beneficial.

[00:07:43] **Camilla Plunkett** For those listening who may never have heard of subsurface drainage before and taking into account Sophie's advice on best practice. Can you describe the process you went through to achieve this?

[00:07:55] **Rohan Marold - Grower** So you do need a elevation map to work out which direction you're going to put these pipes in because they have to be installed at least 500 mm's below the surface. And so you need a endpoint to take that water. So once you've done your mapping and you've got your direction that you're going to take the water, we've found 36 metre spacing of the pipes it drains the paddock within four or five days, so we're happy with that and we have a machine called a tile plough that is like a giant pipe layer and it's operated using RTK GPS with a base station. So the elevation of that flexible drainage pipe under the ground is at a perfect slope to drain the paddock. When we're installing the pipe, we can use T -junctions and main pipes to T into. But most of the pipe we've been installing recently is into an open drain and so we back the pipe layer up to that drain and drop it down to the bottom of the drain to get our level, then insert the pipe into the pipe layer and the software does all the work as far as maintaining that drainage coefficient up the slope, we wanted to increase that spacing as far as we can and we found going out to 36 meters, we were getting sufficient drainage of the paddock to maintain the crop in a healthy condition. So we've done a lot of trials as to the spacing, but also over the three years we've found in every year that where we've installed the pipe, we're getting greatly improved yields, better traffic ability and nowhere near the runoff that we've had in previous years on those paddocks.

[00:09:38] **Camilla Plunkett** That was Rohan Marold from Dalyup near Esperance, giving us a firsthand account on his success with the GRDC trial on subsurface drainage and return on investment. And earlier we heard from Sophie Willsher from South Coast Natural Resource Management. For more information, look out for our video showcasing the latest innovation in tile ploughing. I'm Camilla Plunkett and you've been listening to a GRDC podcast.