# GRDC PODCAST TRANSCRIPT

**Farming systems in low and medium rainfall areas of WA**

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**Intro:** This is a GRDC podcast

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**Shannon Beattie:** A major farming systems initiative spanning five years is underway in the low and medium rainfall regions of Western Australia. Its aim is to support growers in navigating evolving climatic conditions, enabling them to make informed business and agronomic choices to bolster both on-farm profitability and sustainability. Hi, I'm Shannon Beattie. This $20 million collaborative project between GRDC and the Department of Primary Industries and Regional Development began in 2022 and has sites at Northampton, Meriden and Lake Grace. In this episode, we get an overview of the results from the first two seasons of the project, from grower and trial host Kevin Naisbitt and DPIRD's Martin Harries, who gets us started.

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**Martin Harries:** I'm a research agronomist working with DPIRD. I've been working out of the Geraldton office for around 23 years. The main areas of research that I've been involved in include agronomy of broadleaf crops, including the grain legumes and canola, and investigating how these species fit within modern cropping systems.

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**Shannon Beattie:** And how about yourself, Kevin? Tell us a little bit about where you farm and the operation.

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**Kevin Naisbitt:** I'm on a family farm. We manage about 2700 hectares of mixed grains and sheep and those kinds of things. We're situated west of Lake Grace and on part of the farm, we hosted of one of the three trials.

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**Shannon Beattie:** Martin let's go into a little bit of an overview of this farming system project. Can you tell me what it's all about and how it actually came to be in the first place?

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**Martin Harries:** Yeah, sure. So, the Western Farming Systems Project started in 2022. It's a five-year co-investment between DPIRD and GRDC, and I guess we're just looking at farming systems in the medium and low rainfall regions of WA. We're looking at a few different things. Some of the main outputs that we look to address are looking at system break crop options to look at improving diversity within our farming systems. There's an aspect of looking at sowing time to maximise the opportunity of early sowing times. One thing we also are interested in is looking at options for staying profitable under low greenhouse gas emission scenarios. So, within those rotations that we're using, we're including a range of different legumes to see if we can reduce our fertiliser nitrogen inputs.

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**Shannon Beattie:** And Marty, when we say farming systems, what do we actually mean by that? What does that term refer to?

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**Martin Harries:** Yeah, so I guess we've got a bit of a narrow sort of perspective within our agronomic research. So, within our trials, as I mentioned, we have treatments where we look at different rotations. So, we have four year rotations and we overload those rotations with different levels of fertiliser nitrogen. And we also have a bit of a sowing time treatment in there as well with delayed sown cereals. So, by using those treatments and also by having a management committee at each trial site, which gives us some advice on how to manage the agronomy so that we manage things as closely as possible to a farmer, sort of manage paddock. We sort of incorporate that farmer management with those treatments to each of those treatments, representing a different sort of system within each of those locations.

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**Shannon Beattie:** Kevin, talk to me about your role in the project. You mentioned that you're hosting one of the trial sites. What do you actually do as part of that, and why did you want to be involved in this farming systems project?

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**Kevin Naisbitt:** We were originally approached by Brenda (Shackley) about two years ago because she was looking for a site in Lake Grace. We are a low rainfall style area and one of our paddocks fitted the bill perfectly for what she was after in the way of its set up and previous use and things like that. And so, I don't do necessarily a lot with the actual trial itself. It is very professionally run, but what I do get the advantage of is every time the scientists come out and take measurements and do a lot of things like that, I do get access to them, which is lovely. You can pick their brains a little bit and continue on the discussions that way a little bit.

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**Shannon Beattie:** So this project is all about farming systems, particularly in the medium and low rainfall zones. And as we know, these areas have developed a lot over the past 20 years. And we've had increased in areas cropped and there's been yields achieved. But rainfall has also been decreasing. In what way, Martin, is this project hopefully going to help growers in these areas, I guess, navigate those climatic conditions and make sure that they can achieve profitability and sustainability on-farm still?

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**Martin Harries:** As you've described, farming systems have changed quite a lot at all of the sites that we've got. So, we have sites at Northampton, Merredin and Lake Grace and all of those locations, the farming systems have changed in the last couple of decades towards more intensive cropping. And what we're looking at here as far as water use efficiency is not just looking at water use efficiency within each year, but also across the whole rotation to see how we can maximise, I guess, the dollar for each millimetre of rainfall that we're getting across the whole rotation. And also, in the same way we're looking at nitrogen use efficiency. So, by having those legumes in the rotation with different amounts of nitrogen, we're hoping to be able to see across the whole rotation how our water use efficiency and nitrogen use efficiency respond. And whether we can, I guess, maintain profitable farming systems with perhaps fewer inputs to reduce sort of financial risk, and also to look at those lower greenhouse gas emissions options.

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**Shannon Beattie:** Kevin, we've had two very different growing years as part of this project so far, 2023 and 2024. Can you give us a little bit of an overview of what last year and 2024 have looked like on your farm in Lake Grace?

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**Kevin Naisbitt:** Yeah, 2023 was a good year. Had a lovely start. Realistically, everything went perfectly well. There was a nice germination spread between the two barley times of sowing, so we saw a very big difference between them. It was quite a nice little season. It was a very quick end to the season, but all the crops still finished, and the quality was fine. 2024 was probably our worst start to the season I've ever experienced. Didn't realistically get any germinating rain till probably mid-July, so we had a very patchy germination across the farm.

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**Shannon Beattie:** And how, Martin, do these different seasons, I guess, impact the trial and the project that you're undertaking. Are you glad that there's different seasons? Is it helpful for the trial or how does it work?

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**Martin Harries:** The different locations had different seasons as well. In 2023, it varied a bit between those locations. A late start for all of the sites. We had a kinder finish in Lake Grace than we did in Merredin, so yields were pretty low at Merredin. And Northampton, it was a decile one year in Northampton in 2023. Yields were pretty low there compared to the district average. I guess on the back of that we're looking at the growth of the legumes and what's happening in the rotations, and that will have a major impact on the amount of nitrogen that's being fixed. So, it was interesting that even after that low rainfall year in 2023, we've been seeing some really good responses this year with our rotations. So particularly we saw that we had a lot of nitrogen in the topsoil after the fallow treatments. And then we have some brown manure treatments where we've got a bit of vetch or narrow leaf lupin sprayed out depending on the site. And that had a reasonable amount of mineral nitrogen in the topsoil. But in the other harvested legumes, there wasn't much nitrogen around because we had pretty dry summer, and we didn't have a lot of mineralisation at most of the sites over the summer. So yeah, the seasonal conditions really do impact what we're seeing. But luckily, even with that low rainfall year to start off the project, we're still seeing some really good responses this year to those different rotations.

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**Shannon Beattie:** Kevin, how does this information that you're learning as part of the project help you on-farm so far? Has there been anything that's come up from it, even within this first two years that you've really gone, oh wow that's useful, we're going to use that info now?

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**Kevin Naisbitt:** Yeah, we're already seeing results. The low and high nitrogen has been very visual, and obviously the yields have come out quite representative of what they are. Nitrogen is always something that farmers around here are adjusting and evaluating all the time, so it's nice to see the differences between them. The early supply of nitrogen on the lupins was very interesting to see, because a lot of people didn't perceive there to be a difference, so that was nice to see the difference in that as well. So, at the moment we're just seeing the little things. A lot of it's just reinforcing what we were hoping we already do. But also, I think as the years come along, more and more of it will come out in the forefront, it'll be good.

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**Shannon Beattie:** And Martin, can you talk us through any of the other results that you've seen so far? I know that we're only two years in, and there's obviously a lot to be learned still. But what else has shown up so far from the first two years of this project?

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**Martin Harries:** Obviously, the first year is a pretty basic set of results, really. It's just the yields from the different sites without any rotational sort of effect. So as far as yields go and rotational water use efficiency and nitrogen use efficiency, we're pretty limited at the moment. As I mentioned, probably the biggest thing that we've seen through our observations, and obviously the measurements, is those differences in the nitrogen dynamics between the different sites and the different rotations. So that's been really interesting to see, and we're taking quite detailed measurements of what's going on with the soil nitrogen. So, we'll be able to explain what's going on there. It's really the start-up sort of period for these rotation trials. That's probably the most interesting thing that we've seen. But we'll keep, I guess, talking with the advisory groups at each of the sites and refining the way that we're managing the trials and feeding back the new information as it comes along. We're just getting into the more sort of exciting phase of the project now when you start to see some interesting rotation results.

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**Shannon Beattie:** Talk to me about those advisory groups quickly, Martin, I believe you've got sort of some grower and consultant input. What role has that played in getting this project established?

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**Martin Harries:** Yeah, that was really important. We've got an advisory group for each of the trial sites that is comprised of local farmers, the local researchers in each of those areas. So, Brenda Shackley with Lake Grace trial, and Dion Nicol with the Merredin trial, and myself at Northampton. Ourselves, the advisors, and the farmers all sat down and worked on what rotations we thought would be useful to put in the trials. So, a combination of things that are currently being used within the district versus things that people were more interested in seeing, that weren't commonly used. And then, as well as the rotations, we had some good discussions around the rates of nitrogen that would be used. So, tweaking that to make sure everybody was comfortable with the rates that were being applied. And then just going through other aspects of the agronomy as well, and making sure that what we're doing is, I guess, in line with what's going on with district practice, so that when we get to the end of this project, the economics of the trials and the plots can be assessed sensibly and mean something for the farmers at the end. We'll have a meeting each year before sewing just to refine our treatments and our management. But at the moment that's been working really well, and as we develop our ideas and go along, those groups will help us sort of identify new research and things that are of interest to continue on with as well.

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**Shannon Beattie:** Kevin, talk to me about why you wanted to be involved in this project and what you get out of, I guess, helping to shape where it goes and what it does.

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**Kevin Naisbitt:** I find it really important when we're first setting up the trial for farmer input into what we're actually doing on it - fertiliser inputs, rotations and everything like that. It does relate back to what we're already doing, so it's nice to actually have the input into it. With a trial actually on my farm itself, I can relate all my different soil types and everything back to that trial and the results, which has been very beneficial. We've got one plot that the farmers are allowed to play with and adjust after every season, and that's been really enjoyable. You sort of get ten people together and some very good farmers and very good agronomists and discuss a few different things and discuss prices and what's happening around, and we get our little play plot. So that sort of it's been really important, really good and quite enjoying it.

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**Shannon Beattie:** All right, Martin, to finish up, we've got a few years of this project left. Can you tell us where it's going to go from here and what else you're hoping to learn? I guess especially in that greenhouse gas space, as time goes on.

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**Martin Harries:** As the treatments and as the trials progress, we'll get quite large differences between our treatments, so we'll see more dramatic differences. And with that, we're sort of looking at all aspects of the agronomy, so the weeds, disease, the nutrients. So, these trials really provide a really good place to test what's going on with those biophysical constraints. And as we go along, we hope to, I guess, involve other researchers to take measurements that perhaps we aren't able to take. We're looking at our greenhouse gas emissions through a modelling approach, by accounting for all of the inputs that we're using and what's being harvested, we can make some assessments of greenhouse gas emissions in those different rotations. We're hoping to get some measurement of those emissions in the last year of the trial as we go along, and by that stage, we'll have some quite dramatic differences in some of the treatments where we should be getting large differences. They're basically well-established now, and they will provide an opportunity for quite a lot of research in the next few years. And hopefully, if we can secure extra funding, go beyond the current project and put in another round of rotations so we can really start testing things a reasonable amount of time within our farming systems.

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**Shannon Beattie:** And lastly, from you, Kevin, what are you hoping to get out of the last couple of years? Is there any information that you're really hoping to learn?

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**Kevin Naisbitt:** Definitely. I think as the seasons do change, we potentially get frost events and things like that will come through. We'll see a lot of information come from the high and low nitrogen side of it. With the close rotations of cereals, we're hoping to get a little bit of disease come in and we'll see some results come out from that, as well as probably weed issues with the rotation. So, I guess a lot more exciting with the next few years to come with the results of what we're trying to do on farm as well.

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**Shannon Beattie:** Kevin and Martin, thank you both so much for joining me on the podcast today.

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**Kevin Naisbitt:** Thanks, Shannon.

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**Martin Harries:** No problem at all.

00:14:32:29 - 00:14:54:00

**Shannon Beattie:** That was Martin Harries from DPIRD and Lake Grace grower Kevin Naisbitt talking about the Western Australian Farming Systems project. More information on this topic can also 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.