# GRDC PODCAST TRANSCRIPT

**Emerging cereal diseases, focus on Septoria tritici blotch**

[00:00:03] **Intro** This is a GRDC podcast.

[00:00:11] **Sally Maguire** 'Tis the season for disease and grain growers are being advised to be on alert. Hello, I'm Sally Maguire. Spring is a critical time for disease detection in order to avoid or at least minimise yield losses; and already we are seeing higher infection levels than in previous years. Today I'm joined by Dr Hari Dadu, senior research scientist with Agriculture Victoria. Dr Dadu has nearly a decade of experience working with crop diseases and is now leading the Septoria tritici blotch research in wheat, in the low and medium rainfall areas of the southern region. In addition to this research, GRDC is also investing in three more projects in this space, to develop new genetic resources, that will allow growers to have multiple solutions to reduce crop losses in the near future. First up, Dr Dadu, tell us about the diseases you are observing at the moment in cereal crops.

[00:01:12] **Dr Hari Dadu - Agriculture Victoria** There are a few diseases unfortunately, going around in the cereal crops. To name a few, I’ll start off with wheat, Septroia tritici blotch was found early this season and powdery mildew has been concerning to growers in the Northern Mallee. Stripe rust was found only recently, but since then has been detected a few places across Victoria; and barley, both forms of net blotches are present very early in the season. Scald was found recently in Mallee and I also suspect that it be a risk from leaf rust late in the season given the levels we had last year. Moving onto oats, there's red leather leaf appearing up and about and again rust will be appearing very soon or later in the season. So these are the diseases I think that I am seeing out now.

[00:02:04] **Sally Maguire** So how much does the weather affect these diseases, particularly when there is an alert of an El Nino year?

[00:02:14] **Dr Hari Dadu - Agriculture Victoria** Weather can influence disease in multiple ways. In simple words, weather can influence disease either to flourish or vanish. In general, diseases like wet weather because it brings high relative humidity in the canopy, maintain long leaf wetness periods and also support the spread of the disease to new regions; hence as I say, if the conditions continue to be a wet into the spring, then there is high potential for disease to be a limiting factor. Conversely, if the weather becomes dry as predicted, then we'll see very little concern coming from disease.

[00:02:56] **Sally Maguire** So you spoke about quite a few diseases across different crops earlier on there. So what particular diseases do you think that growers should be concerned about at the moment?

[00:03:07] **Dr Hari Dadu - Agriculture Victoria** Yes, Septoria has been severe this season and has likely potential to impact yield if the wet conditions continue. Then that is stripe rust, our biggest enemy during 2022, although it is found little delayed compared to last year, there is still risk this year too, since it's been found at least two weeks earlier than in average years as per University of Sydney report. The earliest it is detected, the more is the risk, so suggest growers [0.0s] to be on alert and act where necessary. In summary, we had a very critical point of the season so that a lot of things will depend on how the spring will turn to. As I said just before, if the spring tends to be wet like last year, then the risk from disease will be high and we might see some yield losses. But I don't think it will be as bad as last year, which I don't want to. But there can be yield losses if the spring turns to wet and there is no appropriate strategies followed.

[00:04:09] **Sally Maguire** So the work that you're doing on Septoria, how is the risk different compared to previous years across Victoria?

[00:04:18] **Dr Hari Dadu - Agriculture Victoria** Yeah, the risk is completely changed from previous years, but the risk is mostly related to the rainfall zones in general for Septoria. So I'll break down the regions into three regions. One is based on rainfall, so one is high rainfall zone, medium and low rainfall zone. Septoria's often referred to a disease of high rainfall zone and the risk always remains high for them and the growers belonging to that region consider Septoria is an important disease for them in weed management, whereas in medium and low rainfall zones the disease has increased, has been found with increased levels of infection in the recent years and particularly in the last two years since we had wet springs. And so the risk is very high. The reasons behind this increase include cultivation of susceptible varieties, stubble retention farming systems and tighter weed rotations. So Septoria's a stubble borne disease, and stubble is the main source of the inoculum, which means if we just sown on wheat even closer to the wheat stubble, then the risk would be high.

[00:05:30] **Sally Maguire** So what signs should growers be looking out for?

[00:05:34] Septoria is one of the diseases, very easy to identify. It produces brown blotches with a low halo around it on the leaves, similar to yellow leaf spot. But the unique symptom of Septoria is presence of black dots or pycnidia in scientific terms and within these lesions. So it is very similar to blackleg of, blackleg of canola in that, in a way. These dots are fruiting structures of the pathogen, but as I said, called pycnidia which contain spores that further spread the disease into new regions of the crop upon rain splash.

[00:06:13] **Sally Maguire** What are some of the management techniques that can be used to prevent Septoria?

[00:06:20] **Dr Hari Dadu - Agriculture Victoria** To prevent Septoria of the best strategies to knock off the inoculum in the first place. First of all, we generally say remove all the self-sown wheat of cereals for stubble borne diseases, it is always managing stubble is the best, best strategy to reduce the inoculum. In that sense, paddock selection and stubble management are going to be very important. Ensure, you have a very good rotation, at least two-year break from wheat is required to control or prevent Septoria in your paddock and any action to reduce the stubble load means you're reducing less, you are reducing the disease pressure in the next season. And also, the other cost-effective strategy would be to use less susceptible varieties where possible to suppress the infection. Additionally, if delaying sowing also has found to be beneficial, which means the crop delayed sowing means the crop will escape the early burst of Septoria spores from stubble and also likely reduce the disease pressure to be managed in the season.

[00:07:24] **Sally Maguire** So what happens when the disease is not managed? What are the potential yield losses?

[00:07:31] **Dr Hari Dadu - Agriculture Victoria** I guess if you have asked me this question three to four years ago, I would have said Septoria is not an issue in this part of the region and not to worry. But times have changed as I said just now with the wet years in a sequence. Yield losses can vary with the regional environment that the paddock is in and also with the varietal resistance. In high-risk situations where there is a susceptible variety sown back on to wheat stubble and with good winter and spring season, rainfall, Septoria was found to cause up to 50 per cent yield losses if not controlled. Conversely, they are less susceptible or more resistant varieties are sown we found no to, less to no losses depending on how the season finishes. So to give an example about that, during last season we had nearly 40 per cent of yield losses in a trial conducted in a similar region in the sense of new varieties. But as the moderately susceptible varieties had up about five or 10 per cent of yield loss. So that is a difference you can expect in terms of yield losses for different places generating.

[00:08:43] **Sally Maguire** So we talked about, there's management techniques to prevent Septoria and then how you can manage it when you when you do have it. So talk us through those.

[00:08:53] **Dr Hari Dadu - Agriculture Victoria** Yep. As I said, variety resistance will be always your best strategy to control in season as well. But apart from that, fungicides are found to be the best option to manage Septoria in season and are proven to reduce Septoria effectively. But in the moderate and the medium and low rainfall regions, the question is whether fungicides is unnecessary. If needed what are the optimal timings to reap the economic benefits? We found that fungicide treatments reduced disease severity compared to the untreated controls and produced yield gain as well in the last season that we had trials and among the treatments we found to suppress one each at middle ring and flag leaf emergence provided high yield highest yield gain of up to 25 per cent. Fungicides sprays that particularly at these critical stages mean that there is protection from primary infection and also limiting and also this sprays limit disease spread to the upper canopy and also thereby protect the crop from yield loss.

[00:10:04] **Sally Maguire** So you touched on it before variety resistance, but can you talk a bit more about the importance of variety resistance in managing Septoria? And specifically, where can growers go to access this information and get an up to date understanding of ratings?

[00:10:20] **Dr Hari Dadu - Agriculture Victoria** Good question. Resistance is generally defined as the host ability to limit pathogen multiplication, which means resistance will always reduce the amount of inoculum that is present in the crop. So this means that is reduced inoculum level one side and going into the future, and also there is less reliance on fungicides and also this low risk of yield loss. So the message is always avoid susceptible to very susceptible varieties if you can. And to find this information, growers, growers can access these ratings through NVT website which is maintained by GRDC or else state-based agent agency websites as well. For Victorian growers, they should consult the current cereal disease guide through Agriculture Victoria website.

[00:11:11] **Sally Maguire** So you spoke earlier about stubble management as an option to manage Septoria. Can you describe the best ways to manage stubble?

[00:11:20] **Dr Hari Dadu - Agriculture Victoria** Yeah, as I said earlier, Septoria is a stubble borne disease. So managing stubble means reducing inoculum load and also disease pressure going into the next season. One of the strategies we found best was to burn the stubble, which means obviously reducing the amount of inoculum that will go. And also there is if there's any other strategy that can take off the stubble from your paddock, this means like you'll always see reduced amount of inoculum. But however, since the majority of the farmers have moved on to stubble retention farming systems because of the benefits it offers, we might need to have an alternative strategy in that case. So the best alternative strategy could be crop rotation, which means you're not sowing wheat on wheat. Instead of that, you're taking wheat on canola, wheat on a pulse crop and this should be sort of a two year break from wheat on wheat. So which means you can get maximum benefit to remove the inoculum from your paddock and less disease going into the season.

[00:12:29] **Sally Maguire** And again, you mentioned fungicides, but how much is fungicide resistance an issue in Septoria management?

[00:12:36] **Dr Hari Dadu - Agriculture Victoria** Yep, fungicide resistance is a growing challenge in cereal disease management. We are seeing ongoing situation with powdery mildew in wheat where some of the fungicides have been compromised. Similarly, Septoria also has great potential to develop resistance to the three groups that we predominantly use in Australia to control it. Currently, Centre for Crop Disease Management at Curtin University, led by Fran Lopez, has found Septoria populations with reduced sensitivity to group three, the DMI group in wheat growing regions across eastern states. So this means you will you will observe reduced efficacy when using these fungicides to control Septoria and Fran and his team also found resistant populations to group 11 or strobilurin chemistries in South Australia in total and 21. So this means you might see the fungicide failure when you're trying to target Septoria with these. But the good news is this is not currently detected in Victoria or other eastern states, which means growers still can follow using these fungicides but make sure that they follow the best fungicide management strategies to prolong the longevity of these fungicides. So this can include non-chemical methods to control Septoria, use of resistant varieties, crop rotation, delayed sowing. If fungicides are used, please remember to rotate the chemistries, and also avoid unnecessary use of fungicides. And apart from that, please follow Australian Fungicide Resistance Extension Network or AFREN to follow latest updates on fungicide resistance issues and also strategies to manage fungicide resistance.

[00:14:25] **Sally Maguire** Are there any specific actions that growers can take or that they need to consider between wet and dry seasons when it comes to Septoria?

[00:14:35] **Dr Hari Dadu - Agriculture Victoria** Yeah, good question again, one of the things to keep in mind when dealing with Septoria's latent period. Latent period is defined as the cycle time between first infection to the appearance of first symptoms on plants for Septoria it is usually long and can extend up to 30 days depending on the existing conditions. To be more precise, if you find the symptoms on the lowest leaf, then you can expect disease in the latent period on one leaf higher than the leaf with symptoms. This apparently can cause confusion in terms of timing of your fungicides. If you compare with other diseases like rust, where it has short latent period. The response can be reactive, but whereas with Septoria, you have to be proactive in your fungicide timing because the crop will look as clean as possible, but the symptoms are there inside and if you delay your fungicide spray then you won't be able to control the disease. So the message is to be proactive in managing Septoria, if conditions are suitable and symptoms are present, can start control options depending on the variety of resistance and yield potential. But to answer your second question, I guess at this point of time we have higher infection levels than there were before. If the season continues to be wet, then we are very sure we'll have some losses to Septoria. But if it is dry, there may be very little concern from Septoria, as I said earlier. But the best way to think about it is to plan for the worst-case scenario. That is, apply a fungicide to limit the infection spreading to the upper canopy as crops reach flat leaf emergants and worry about the situations later. If they are not suitable, then you won't need a second fungicide and the first fungicide would still have done a great job limiting the infection from causing losses.

[00:16:31] **Sally Maguire** Okay, so GRDC is investing heavily in the Septoria space. Can you tell us a little bit about the investment that you're involved with as part with GRDC?

[00:16:44] **Dr Hari Dadu - Agriculture Victoria** Yes. So we're fortunate to have this investment from GRDC a couple of years ago. So we are looking into finding epidemiology and management strategies for Septoria tritici blotch in medium and low rainfall zones of southern Australia. So the main aim is to understand how the disease develop and spread in these regions and also what are the strategies that growers need to think of in controlling this disease because disease was not there, was not a problem in these regions before and now it is. So we are trying to address that and provide information as much as we can to growers to better manage Septoria.

[00:17:24] **Sally Maguire** And in the meantime, what's your main sort of key message to growers about Septoria?

[00:17:32] **Dr Hari Dadu - Agriculture Victoria** Yes, in Septoria we have we have to discourage a disease that can cause yield loss as if we don't really control it. And as I said earlier, we have been finding increased incidence in the recent years because of the wet years that we had. And this year particularly, we have higher infection levels than we have seen in the last couple of years and better where you have susceptible to very susceptible varieties. And depending on the infections that you have, you might need to consider controlling it. And wherever there is moderately susceptible or above better resistant rated varieties, you might need to monitor the crops and see if you have to use a fungicide in case if you have higher infection levels. And again, as I said earlier, a lot will depend on how the spring will turn to whether if it is a wet or dry, but always have your control strategies close to your chest so that you can manage Septoria better.

[00:18:36] **Sally Maguire** That was Dr Hari Dadu from Agriculture Victoria, sharing valuable advice for cereal growers around disease detection and management this season and some of those resources he mentioned, disease ratings can be found on GRDC's National Variety Trials Website: nvt.grdc.com.au; Agriculture Victoria produces its Cereal Disease Guide, which can be accessed through agriculture.vic.gov.au; and the Australian Fungicide Resistance Extension Network's website is afren.com.au. I'm Sally Maguire. This has been a GRDC podcast. Thanks for listening.