# GRDC PODCAST TRANSCRIPT

**Harvester Fires In Lentils**

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

[00:00:12] **Shannon Beattie** Harvester fires are unfortunately par for the course at this time of year. But that doesn't mean there aren't actions we can take to mitigate the risk. Hi, I'm Shannon Beattie. Lentil crops tend to be particularly susceptible to harvester fires. So in this episode, I'm joined by Ben White from the Kondinin Group, as well as Adrian McCabe, a grower from South Australia, to find out why that is and what steps can be taken to reduce the chance of these incidents occurring. First up is Ben explaining what the primary causes of harvester of fires are.

[00:00:44] **Ben White** If we have a look at some of the research done which investigated a whole stack of fires from around the country on harvesters, we asked owners what the cause of the fire was, how much damage it did. A couple of common things came through that dataset, one is the dust and chaff build up across the machine. And the problem with that is that, where you've got dust and chaff building up on the machine, you might get incendiaries that sort of float down off the exhaust system and light those piles of flammable material up, and the other one is mechanical failure, so bearing failure is very high on the culprit list as well.

[00:01:12] **Shannon Beattie** Let's go on to some solutions then, what can we do to prevent harvester fires?

[00:01:19] **Ben White** There's a couple of things if we look at those primary causes that we identified, so the dust and chaff build up and also, say, bearing failures, there's a couple of things you can do. The first is obviously keeping the machine as clean as possible. So hygiene is number one when it comes to harvester fires, we've got to keep the machine free of that dust and chaff build up, particularly in areas where there's a higher risk of incendiaries again coming off the exhaust. So battery boxes, fuel, top of fuel tanks, those sort of areas, are normally dead areas for air movement and so we do tend to get in a bit of chaff and dust build up there, so we try and keep those very clean. And also bearing failures, a common tell-tale is that the temperature of the bearing operating will increase pretty rapidly. So, one of those little infrared temperature guns is a really good tool to have a look at bearings on the machine and just keep a bit of a log of what those bearing temperatures are doing. So those couple of things will keep us in good stead in terms of minimising the risk of harvester fires for the two primary causes of fire that were identified.

[00:02:12] **Shannon Beattie** Now this episode is all about lentils, so tell me why lentils are particularly fire prone.

[00:02:18] **Ben White** One of the issues with lentils is that they actually have a really low smoulder point, so as low as 160°C and I can tell you there's plenty of areas on a harvester that exceed that. So, lentil dust is super flammable, it smoulders at a low temp, all it then needs is a bit more oxygen and of course, you've got a fire. The issue with lentils is that we're typically operating in conditions that are very dusty, there's lots of fine material around, again, we're talking about those incendiaries off the exhaust system, tend to float around a fair bit and can light the machine up. So, lentils are one of those things where some years are particularly problematic, and it might be that we've had a high rainfall year. So a lot of biomass, a lot of leaf material, and then we might get a shower of rain that drops a fair bit of that material or knocks a bit of the dust off some of the leaves on the plant and so, after that fall of rain things mightn't be quite as bad from a fire prone perspective. The issue is there, that we don't know a lot about that, we don't know what causes that, we know that lentils are flammable, we know that some years are worse than others. There's a bit more work to do to sort of discover what actually is triggering that.

[00:03:19] **Shannon Beattie** Lentils are particularly fire prone, we've established that. You did mention a few tools earlier, you mentioned a thermometer that people could use to help prevent harvester fires. Are there any other specific tools that we can use to help us with preventing harvester fires, particularly in lentils?

[00:03:37] **Ben White** Yeah absolutely. If we touch again on the infrared thermometer, they're 50 bucks, and you can grab one of those from any auto store; have one in the cab. Thinking about what else could be in the cab, you know, we talked about hygiene and the importance of hygiene and the frequency of blow downs and making sure that machine is as clean as possible, particularly in high fire years. Blowdown options include things like battery leaf blowers, and everyone's got 18 volt tools these days. You can buy some really high capacity blowers that use the same batteries as those battery tools and you can keep those in the cab. So you know, you've got a high volume blower that you can keep in the cab, you can blow the machine down, keep it really clean. Then the other thing is you've got things like dedicated airlancers that have a Venturi nozzle on them and what they do is use a pretty high capacity air compressor, like 120cfm air compressor, which takes a lot of the pressure and the Venturi amplifies the volume, I guess if you like, of that pressure going through the nozzle and it shifts a lot of material. So we're able to get the harvester really clean, we're able to blow a lot of material off quite quickly, and so dedicated tools like that are definitely worth thinking about if you are working in a fire prone crop like lentils. You want to practice that hygiene, clean and blowdown pretty frequently, and tools like that can be really helpful in terms of making that as easy as possible.

[00:04:49] **Shannon Beattie** What about the exhaust system? Is there any way of combating that as an incendiary?

[00:04:55] **Ben White** We've been talking about the incendiaries and the issues around those, and typically that's where most fires will start, if you like. You know, you'll have that small ember that will float down off the exhaust, it'll land somewhere and of course, that's where you smoulder starts and therefore you fire might sort of take off from there. There are a couple of options we've got and some dealers around the country have been using coatings, things like ceramic coatings are quite popular. The idea with the ceramic coating is, basically we're just making that exhaust system as smooth as possible so it's not a rough surface so that dust material won't sit on there and turn into those embers or those incendiaries, and anything that smooths out that surface of the exhaust system is a good option. There are some paint options available, really high-temperature paints that will work as well, they have to be used sort of four or five times to get a decent layer, a decent thickness and a nice smooth finish, and there are other options like blankets and bandages and that sort of stuff as well, which I guess perform more of an insulation sort of barrier as opposed to making the surface smoother. So, there's been a lot of work done in the area. The issue with the blankets and any of the bandages is that they can actually trap some dust as well. You know, amorphous silica does the same sort of thing, potentially trapping that dust and of course, once you trapped some dust near the exhaust, that's when you can actually create some embers and some more incendiaries. So, we're kind of back to where we were and we want to make sure that things are just as clean as possible. So, yeah, the exhaust system has a few options, but you know, the horses for courses and some of them are a little more effective than others.

[00:06:20] **Shannon Beattie** So we've covered what we could do to potentially stop or prevent a harvester fire, but as we all know, these things do still happen. If there is a fire on a harvester, what do we do then?

[00:06:31] **Ben White** Well, we don't panic. That's the first thing.

[00:06:34] **Shannon Beattie** Good, good tip.

[00:06:35] **Ben White** Yep. Keep a cool head, if you do have a fire on board, get out of that crop as quickly as possible. Obviously, you want to get out of the standing crop because that's going to be quite flammable. So if you can, move the harvester into an area that has already been harvested, where there's not as much biomass, face the harvester into the wind so that if there's a prevailing wind or breeze that's blowing the fire from the front to the back of the machine. That just helps buy you a little more time in which you might be able to have a crack at trying to put the fire out. The most important thing, though, is really just to engage the communication plan and I think that's one thing that I'd suggest everyone sit down and do, is make sure that they've actually had a communication plan, established with the harvesting team. Everyone needs to know what their role will be if there is a fire and that comms plan is the first thing that really should be enacted in any case. And I think that that short meeting at the start of harvest could save people a lot of angst and also probably make people feel a little more confident in terms of dealing with the fire, if there is one.

[00:07:30] **Shannon Beattie** Any other preparation tips? I like the tip of keeping your head screwed on straight, that's a good one, but any other preparation that we should be giving our team in the lead up or in the potential of a fire?

[00:07:42] **Ben White** I think the first person that’s typically be on the scene of a harvester fire is the chaser bin driver. So make sure that they're up to speed with extinguishing practices you know, how do you put the fire out? Make sure that they know what it is that has to be done in terms of either starting the fire extinguisher or if there is an integrated extinguishing set up on the chaser bin, make sure they know how to use that. Those sorts of preparations are really important because what it means is that if people are on the scene of a fire and they can get it under control pretty quickly, it's always a lot easier to put a small fire out than a big one. So spend a little bit of time training the chaser bin operator, make sure you do have that team meeting and make sure that everyone's got access to the UHF channel, emergency numbers, phone numbers for staff and neighbours and keep those in the cab because they're pretty important things to have in the case of a fire so you can alert people and let them know and, as I say, engage that communication plan.

[00:08:31] **Shannon Beattie** All good tips. Thank you for joining me on the podcast today Ben, and sharing your pearls of wisdom with everyone.

[00:08:38] **Ben White** Absolute pleasure, thanks, Shannon.

[00:08:42] **Shannon Beattie** Now that we've received that really practical advice on how to help stop or help mitigate the risk of a harvester fire, especially in lentils, we wanted to chat with a grower, chat with a farmer about their own experience of going through a fire or dealing with an instance like that. I'm now joined by Adrian McCabe, who was part of the Pinery fires in 2015 in South Australia. Thank you for joining me on the podcast today, Adrian.

[00:09:12] **Adrian McCabe** Brilliant, thanks for the opportunity.

[00:09:14] **Shannon Beattie** Can you tell us a little bit about your experience in those fires in 2015?

[00:09:19] **Adrian McCabe** 2015 was certainly the most horrific ones that we'd ever experienced or even seen or gone to. Obviously, we are in a lentil grain legume area here in the lower part of South Australia or the lower north. So we're quite used to going to fires, we do start them, we do reap on the deck, but this was extraordinary. I remember driving to the fire that day, listening to the ABC News, most of us were actually in bed when I started because we reaped all night. The forecast was pretty horrible, and then unfortunately a bit of a spark from a battery set a fire going. So, all waking up, jumping into the fire vehicles, driving out to it and to hear the ABC saying the CFS were just planning for triage, they weren't planning to fight the fire. Bells started ringing then going, oh hang on, haven't quite heard that before. It was extraordinarily dry, it wasn't particularly hot, was probably about 30/ 32 degrees, but the fire was moving so fast.

[00:10:06] **Shannon Beattie** I can only imagine how confronting it must have been to be in the middle of a fire like that when you've been around fires before and you think that you know a bit about them and to then be in a situation where you are confronted by just how uncontrollable and just how unknown of an element fire can be. Can you tell me a little bit more about this fire code in South Australia? I can't say it's something I know a lot about. So what does it actually set out for people?

[00:10:32] **Adrian McCabe** The Fire Behaviour Index, the GFDI, that actually talks about the temperature, wind speed, humidity but also then talks about grass moisture as well. But all that became really difficult and they measured that at 10m. So there's less drag across the wind, they can measure wind easier at 10m, or the wind's a truer reading at 10m and that's based off work by McArthur. So the McArthur index is what it's all based off. But, because we can't measure at 10m, even if I stand up on top of my header I'm only at seven, or six and a half, depending on my height, I can touch powerlines but I can't measure wind speed. So, we decided on a fire index of 50, measured a 10m which converted down to 35 at two metres. So people in their paddock could go out and go, "Right, I can harvest"; and the beauty about the South Australian experience is, if I'm on the Yorke Peninsula surrounded by cool, coastal sea breezes, I can go reaping. But if I'm on the Adelaide plains and it's a howling northerly, I've got to knock off. So in my paddock, I can test what I should be reaping or not. It's designed to get harvesters in the paddock early and get the crop off.

[00:11:27] **Shannon Beattie** This episode is all about harvester fires in lentils, you said that you farm in a very heavy lentil legume area in South Australia; do you have any tips for other growers based on your experience with dealing with fires? With the fire code, and just with being a farmer and a grower who deals with a lot of lentils, what tips can you give other growers for reducing the harvester fires when they're in a lentil crop?

[00:11:54] **Adrian McCabe** Firstly I'd like to say, don't be paranoid about lentils. I mean, we probably solved a lot of the issues we had initially when we first got into a lentil harvest. But the beauty about lentils is there's not a lot of bulk out there. You can put a fire out in lentils like, I know we all want to jump and make a big thing about lentils, but if you're inside the harvest code, you can get a fire out in lentils really simply, there is not much to burn out there.

[00:12:14] **Shannon Beattie** If you could give us a little bit of information on what it is you actually do, yeah, in the crop, that'd be great.

[00:12:19] **Adrian McCabe** For those who have stones out in the paddock, like slate stone or iron stone, they've got some pretty heavy rollers. They're going out with big stone rollers to get them to really roll them in flat so they're not touching them. Firebreaks; don't sow to the fence line, you've got to have a four metre firebreak, be really aware of that firebreak down the windward side. When that hot northerly comes in, or depending where you are in Australia to what the fire breeze may mean to you, but, certainly on the Adelaide Plains here, one we're worried about is the hot northerly. That's the one that's going to send the fire through the roof, so make sure there's a decent firebreak that side. You may, in a massive paddock, even put in another firebreak. Reap an area? Put another firebreak in if it's going to be a hot day, or a hot week and you trying to get it off. So firebreaks are crucial, so that starts in early October, July, August, the last one in October, get them clean, and if they're not clean, disc them, do it properly. Everyone deserves it, your neighbours deserve it, you'll feel a lot better out on the header with them done anyway. Harvest planning, wind direction, where to plan your storage; don't stick storage where the fire is going to go. Have a look at the wind forecast for the day, when it's hot, make sure you haven't got gear to get out of the paddock when the inevitable at some stage in your lifetime probably will happen. Reap on a crosswind. Don't have chaff blowing over all the hot parts of your header. You don't want tinder blowing over your turbo. Be really critical, if you've got to change directions, change directions. Just put up with it, get on with it. You're harvesting lentils, they're 1000 bucks a ton, you're doing 20 ton an hour, take a moment, change direction. You're still going ok, even if you're not getting along blazing, you'll have to. Make sure you've got access to air so you can blow the header down whenever you want to. If it has been up your tail for a while, blow the header down again. Get out and have a look, it takes five minutes. Jump up the back with an air hose, you know, make sure you've got access to air to give it a good clean down occasionally. Make sure you've got CB access; critical. You need to be able to talk to someone else, or someone needs to be able to get in touch with you if you've started a fire behind you. Early detection makes it so much easier to put it out obviously. Have the fire department number, have your paddock ID. If you've got to ring someone, let them know where you are. Everyone's got good fire units, they're all reaping around you with lentils and beans; they've got fire trucks. You know, the gear around here is unbelievable, people turn up with full fire trucks with 5000 llitres of water on it. Let them come and let them know where to come. That's pretty critical.

[00:14:24] **Shannon Beattie** That's really good advice. It's almost to expect the inevitable and be prepared for it, is the most helpful advice, the most useful advice anyone can get. Thank you so much for taking the time to join me on the podcast today Adrian, I really appreciate it.

[00:14:44] **Shannon Beattie** That was Ben White and Adrian McCade, speaking about harvester fires in lentils; how to prevent them and what to do if that happens. 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.