# GRDC PODCAST TRANSCRIPT

**On-farm Grain Storage – Storage and aeration 1/3**

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

[00:00:11] **Debra Bishop** On-farm grain storage options are many and varied and usually involve a significant and long-term investment. Innovation and technology are all part of grain storage options that are now available to growers, but it's also all about choosing the right storage for your needs which will also deliver quality management options, such as gas-tight sealing and aeration systems. Hi, I'm Debra Bishop. Cone-bottomed silos, flat-bottomed silos, sheds, bunkers, bags and pits; yes, the choices are many. But it comes down to your main purpose of storing your grain and the resources you have, including labour, capital and equipment. Cost-cutting or even buying a top-of-the-range option won't necessarily deliver the outcomes that your farming system requires. Matching the storage choice to the purpose you require is key, and that means seeking advice before investing. Aeration of your storage system also makes good economic sense by helping to maintain lower temperatures and consistent conditions to avoid moisture, condensation, mould and insects. I caught up with Ben White and Chris Warrick from the GRDC Grain Storage Extension Project to find out the starting points around grain storage options, along with the economics of aeration. Chris kicks off our conversation around the need to acutely identify your storage options to ensure you make the right investment.

[00:01:45] **Chris Warrick** Often as the Grain Storage Extension team, we're asked the question "What's the cheapest form of storage?" and in reality, it comes down to trying to match the storage type with the purpose. So, figuring out why you're storing grain, what type of grain you're storing, and how long you're storing it for, and there's different options that might suit those purposes.

[00:02:01] **Ben White** I think the other thing, Chris, is that quite often the cheapest form of storage may not necessarily be the one that's best matched to a particular purpose. So it can take a period of time to sort of work through the options and figure out what's going to best suit you, because some of those investments will be longer-term investments and we'll obviously play out for 20, 30 years, some might be short-term investments and might just be for a single season or a single use. So it really depends on, as you say, what the period of storage is going to be and also the commodity that's being stored and the end purpose for that commodity. So it's a little bit of research that's required to actually get to the bottom of what might be the best storage option for an individual grower.

[00:02:42] **Debra Bishop** Because that ideal storage option, it does depend on the storage type, doesn't it? The purpose that you're needing to apply it to, the farming system, the resources that you have; Ben, it's such an open question, isn't it? So what's the starting point, or is there one?

[00:02:54] **Ben White** Certainly, I think we've got to define exactly what it is we're wanting to do. If we only need, say, some short-term storage to manage your harvest logistics and keep harvesters running in the paddock and not be held up, then shorter-term storage options might be ideal. It might be the case that a shed that might be multifunctional or a multi-purpose shed might be suffice to store grain for short periods of time while we're in the paddock continuing harvest and it also might help us with high moisture management, for example. So, that's an example of something that is suited to purpose. The alternative is where we're wanting to store grain for longer periods of time, potentially six months or more. It might be that we need to invest more money in storage and permanent infrastructure there. That gives us some options and I think, in a lot of cases it's about having the options and one of the important options for longer-term storage is the ability to fumigate, to eradicate any infestations of grain storage insect pests that might be in a parcel of grain. If that's our intended purpose, to hold grain for longer periods, then a selection of grain storage, in that regard, might be completely different to that short-term example that I gave earlier.

[00:03:59] **Debra Bishop** And Chris, the issues of labour, capital equipment; I mean sheds, as Ben has just said, are nearly impossible, I suppose, to fumigate, but if that's not your purpose they're a reasonable option. But it does come down to labour, capital, equipment. What have you got on hand? What do you want to achieve here?

[00:04:14] **Chris Warrick** Each farming system is very different and some might have access to capital and be able to put in permanent infrastructure, others may have access to labour but not so much capital. So, the most cost-effective for them might be the short-term storage; the bunkers, the pits, the bags, that don't require a huge amount of capital to set up. I think it's probably worth also asking yourself, "How many years out of ten do we expect to use the storage?". If we only have good years, sort of two in ten, in our environment, then we may not choose to set up a heap of permanent infrastructure that's going to sit there and cost us opportunity cost in capital, but may sit there empty for eight out of ten years; we might be better with more temporary flexible storage. But, for a farm that has the opportunity to use the storage even more than once a year, a winter crop and a summer crop, then, permanent infrastructure can be really cost-effective.

[00:04:58] **Debra Bishop** And that's also a very long-term investment, isn't it? Because then you are setting yourself up for even a couple of decades or more of storage option with that particular piece of infrastructure, if you like. So you've got to be pretty careful, don't you, in outlaying financially, but to determine exactly the need that you're trying to fulfil at the same time?

[00:05:14] **Chris Warrick** Yeah, spot on. You can look at the cheapest silo you could buy out there, but as Ben said, if it's something that's going to last you for hopefully 20, 30 years and you've just bought it on price at the time of purchase, it could be a pain in the neck for you for 20, 30 years if it doesn't actually do the job you want it to do. So, it's not like other machinery that you can go and replace when you find out that you should have bought a better model. It's stuck there for the life of the silo.

[00:05:38] **Ben White** And I think the important part in that is that you need to do your research before you do invest. Particularly in that permanent storage, and certainly, the Grain Storage Extension team have done a lot of work looking at the options available and certainly, looking at both the features and whether, you know, for example; with sealed storages, or gas-tight saleable silos, we've been around and tested all the different makes and models around the country that we can get our hands on, and so we've got a really good idea, and certainly a great number of resources that we can share with growers who are in the market to buy that permanent storage; who can make some informed decisions and hopefully not get landed it with those lemons that, as you said, Chris, you know, they can't turn over because it is permanent on-farm storage.

[00:06:18] **Debra Bishop** Now, we were talking prior to doing our podcast today, of the options available; cone-bottomed silos, flat-bottomed silos, sheds, bunkers, bags, pits. Is there a… as you say, the standout is what suits you best, but is there any hard and fast rules to look for and to be guided by in that consideration?

[00:06:35] **Ben White** I think the important part of that decision-making process if you like, is, as we've said, evaluate what you need. Certainly, there are options that aren't suited to particular, as Chris said before, the period of time that you want to store things for. Bags as an example, good for short-term storage, not so good for long-term storage and I suppose, when we're talking long-term storage, we're talking sort of 6 to 9 months or more. You certainly could have bags, and we've seen bags on-farm for longer periods, but, they require increasing levels of maintenance and monitoring and I think, from a bag perspective, that's one of the things that is really important in setting up bags is that, you've got an area that's defined, that's either fenced off, it certainly needs to be on a slope where water can run away and not pool around the bag. So it's about having some thought about, not only what sort of infrastructure are you going to put in, whether that's permanent or temporary, but also what areas you're going to install that in and how long it's going to be there for. So preparation is key to a lot of this and certainly, planning is really important as well.

[00:07:29] **Debra Bishop** Now if we move on to the economics of aeration, because aeration in most of the options that we just discussed is a potential facility for consideration. Costs and options available in that direction?

[00:07:42] **Chris Warrick** It's probably worth mentioning, Ben, the managing bags and bunkers can seem a bit tricky, but also, if silos are not set up well, can be tricky to manage. But aeration cooling is a really good tool that can help us manage grain in storage.

[00:07:53] **Ben White** It is absolutely. Aeration's a really valuable tool and certainly one that in some states is underutilised and I think it's one of those tools that is probably not as well understood as it could be, and particularly around the cost side of things. Both the capital cost required to install aeration and then also the ongoing running costs of aeration and the Grain Storage Extension team do get a lot of questions about what those costs are and look, some of the numbers we've been talking about recently sort of indicate that it's not as expensive as people might think. You know, typically an aeration process runs a little bit like this; you'll have a cooling period where you're trying to drop the temperature of the grain with cooling and then into a maintenance phase. Now, that cooling phase might cost anywhere between sort of mid-40 to 50¢ a tonne to get the temperature of the grain down, from what it might have come in from the paddock, down to what we'd consider a longer-term storage temperature if you like. You know, we looked at mains power versus generator-supplied power; the costs are quite similar, so I think it was around 22-24¢ a tonne ongoing, and then about double that to get that grain temperature down initially. So you know, it probably depends, again, talking about evaluating how long you're going to want to store grain for. I guess some of the considerations around those costs come into play there, again, just in terms of the time frame that you expect to hold grain for on-farm.

[00:09:11] **Debra Bishop** What assistance can the GRDC Grain Storage Extension team offer growers in regard to determining those calculations on the economics of aeration?

[00:09:20] **Chris Warrick** It's something that each grower needs to do for themselves because electricity costs will vary and generator size and fuel use will vary on-farm depending on the capacity of your storage and your aeration system. So, the Grain Storage Extension team can help you with the calculation using your own costs, and to also help understand what the benefits of aeration cooling can provide. So some people often just compare aeration cooling to fumigation costs but don't realise that aeration is about hopefully reducing the number of fumigations you need, sure, but also maintaining grain quality, colour, germination and deterring insects, but also managing potentially, temporary storage for high moisture grain holding with aeration.

[00:09:57] **Ben White** Yeah, I think aeration is a really valuable tool when it comes to moisture and just managing, particularly in a high moisture harvest year, we can hold grain for longer periods of time with aeration and so yeah, it is a really valuable tool.

[00:10:10] **Debra Bishop** So, there are the benefits of cooling grain, are there any costs of not cooling?

[00:10:15] **Ben White** Ultimately, the cost of not doing some of this stuff can be huge and the most expensive storage you can have is the one that doesn't work, and grain spoilage and deterioration of quality in storage can be quite costly. So, when you're talking about losing a fraction or a percentage of the grain due to spoilage in storage, that's where costs spiral pretty rapidly. So, all of the things that we're talking about are quite minimal in comparison.

[00:10:37] **Debra Bishop** So, a lot of options on the table, a lot of reasons to consider which way to go, what is the advice? Where do growers go to get that definitive information from?

[00:10:46] **Chris Warrick** There's a really good GRDC resource called the GRDC GrowNotes on Grain Storage, and that's available on the storedgrain.com.au website. That includes all the pros and cons of different storage types and how you might manage each storage, and there's also a spreadsheet in there on calculating the economics of grain storage. So if people want to go through that booklet and select which storage type might suit their system, then work out the numbers on that. So, storedgrain.com.au, or alternatively, they can give one of the team a call on 1800 WEEVIL.

[00:11:17] **Ben White** I think, Deborah there's, as you say, a plethora of information there and certainly a team willing to help. So, if people are confused or they just want a bit more information about the path they've selected for their grain storage on-farm, they're more than welcome to give us a call at any stage and we're happy to step them through the information available and help them make the right decisions.

[00:11:35] **Deborah Bishop** Fantastic, and expect some calls I would say. Ben, Chris, thanks a lot for your time today.

[00:11:39] **Chris Warrick** Thanks

[00:11:40] **Ben White** Lovely to chat, thanks.

[00:11:48] **Deborah Bishop** We've been listening to Grain Storage Extension Project members Ben White and Chris Warrick and as we heard, more information can be found at storedgrain.com.au and via that 1800 WEEVIL hotline, where there's a national team of specialists who'll take your call and help you with any questions about your grain storage management. I'm Debra Bishop and thanks so much for listening.