

Episode Title: Grain Bin Safety, Part 1: Motivation and Tips to Prevent Engulfment

Topic: Preventing Injuries and Fatalities from Grain Bin Engulfment

Episode Summary: This is our first episode in a series on grain bins leading up to grain bin safety week. In this episode, we focus on grain bin safety and the life-threatening hazards that can occur when working around stored grain. With most grain in the United States stored on farms, listeners are reminded that protecting family members, employees, and themselves from grain-related risks is a personal responsibility that requires planning, training, and safe work practices. The episode features Illinois farmer Norm Deets, who shares his firsthand experience of becoming trapped in a grain bin while unloading soybeans. Emily Krekelberg, Extension Educator in Farm Safety and Health at the University of Minnesota, joins the conversation to explain how to prevent grain bin injuries and fatalities. She also discusses the importance of medical evaluation after an engulfment or near miss, including attention to both physical and mental health.

Expert: Emily Krekelberg

Episode Quote:

"I never thought it would happen to me. I was always safe. I was always smart. But just one second of poor judgement or hurry. And this is what can happen."

– Norm Deets, Farmer from Milledgeville, IL

Transcript

00:10 E Presnall

Welcome to the *FarmSafe* Podcast brought to you by the Great Plains Center for Agricultural Health. In the blink of an eye, an injury can change your life and your farm forever. During each episode, we share first-hand stories and real-life tips for making safer and healthier decisions while on the farm.

00:32 E Presnall

In the United States, more than two thirds of grain is stored on farms, where there is limited regulatory oversight because OSHA cannot enforce their rules on family farms. It is your responsibility to protect your employees, spouse, children, grandchildren, and yourself from grain bin hazards. Basic safety practices are the foundation of many strategies to improve safety when working or living near grain storage, however, more farm-related education and enforcement is needed.

01:04 E Presnall

At the 2023 Farm Progress Show in Decatur, Illinois, I talked with farmers about safety and health on the farm. Norm Deets was one of these farmers, and he told me about his experience with a grain bin rescue.

01:18 N Deets

I'm Norm Deets from Milledgeville, IL, and this happened to me on July 20th. I was unloading beans onto a semi, taking them to market. And I had a friend and the truck driver there with me, and I must have had just something on this inside of the bin. And I thought it was getting close to running out the center, but something clogged the center hole. So, I climbed up into the bin and I— at that particular point in time, I went in to try to unclog it. I had a little rod to unclog it, so I got it unclogged and they started the auger again and all of a sudden I sunk to my knees.

And then at that particular point in time, I couldn't move. I mean, it was around my knees, I couldn't move at all. And it was still running, so the grain was still flowing. Now the good part was that my feet had hit the ground, so I knew I wasn't going any deeper, but the soybeans kept coming in and I couldn't get them to stop it. They couldn't hear or whatever. I had a shovel in my hand. Finally, I threw it against the side of the bin, and they did stop the auger at that point in time. But ultimately, the grain got up around my neck and there's no way to get me out. So, we called 911. The local fire departments came, and they used the tube.

02:53 E Presnall

Oh, that's awesome.

02:54 N Deets

And fortunately, they were able to get me out thanks to the Milledgeville Fire department and surrounding area fire department. They really had quite the process because they put everything into progress. The helicopter flew down from Rockford, the whole 9 yards. But they were able to get me out, and there is there's no problem from that standpoint. From my perspective, and I think staying calm helped, I knew that I had to control my breathing because it was pretty tight on my chest at that particular point in time.

03:35 N Deets

They were able to get me some oxygen, which really helped reduce the breathing and just having something over my face because it was kind of quick saying I just kind of kept sinking, even though my feet were on the ground. I think my legs started to buckle, so I kept sinking, so just having something over my mouth was very helpful at that particular point in time. They got me out. I did have to spend the night in the hospital because of the pressure.

04:08 E Presnall

Yeah, that's good though that you were willing to go because that can be a real problem.

04:13 N Deets

Yeah, you know, I got out of the bin, and I was kind of like, you know, inverted bubble wrap with soybeans all over my body. They had pointed in, you know, so I was kind of inverted a bubble wrap, but no worse from the wear from that standpoint, the mistake—two mistakes—I made is number one, I kind of underestimated how much grain was still left in the band and #2 they turned it on without having somebody up to watch to see what happened with me.

04:45 E Presnall

Did you implement anything to kind of avoid that happening again?

04:49 N Deets

Well, absolutely. There's two things. #1 I will just not be in a hurry and judge you know what grain is in there? I'll never going to enter without a harness again. And if we do something like that and make sure somebody's watching me. From that standpoint, my wife was none too thrilled about the process, she says it's time to retire from farming. I said no, you're never going into a bin again, I said, "Well, that's not possible." You got these safe ways to do it.

But yeah, yeah, I thank God he was on my side that particular day watching over me but. I mean when I got out, you know, the doctor was there and the people and they said, you know, not many of these have happy endings, so I think it was obviously good for me. I think it was good for them as well with the rescue crew knowing that their training really pays off because they got to say and that's what they do and most of them are volunteer. You know in the small.

05:51 E Presnall

Right, right. They do those grain bin rescues. I've seen one before they go around, they train on how to rescue and it's critical.

06:01 N Deets

Yeah, right. And I think just having a success because they have plenty of where they don't turn out, so they had to do this thing, you know, they had to cut the side out of the bin and dream of the soy beans and whatever but that's kind of my story. I wish I wouldn't have to tell this story, but in the same token, you know, I got to tell this story because it does happen. I never thought it would happen to me. I was always safe. I was always smart. But just one second of poor judgment or hurry. And this is what can happen. But I got lucky. So, I so for all you out there, don't get in a hurry. Don't rush. It can happen to you.

06:44 E Presnall

Yes, yes, exactly.

06:46 N Deets

And thank you for our first responders for the job that they did.

06:57 E Presnall

To better understand the hazards associated with grain bins and how to prevent grain bin-related injuries and fatalities, I talked with Emily Krekelberg again—the farm safety and health extension educator from the University of Minnesota featured in our tractor safety episode.

07:15 E Presnall

So, I just want to know, can you discuss some of the safety precautions for preventing grain-related incidents?

07:23 E Krekelberg

Grain related incidents now, I'm really thinking the entanglement, the engulfment those types of things that I was just talking about. I think we all can think of at least one if not multiple tragic stories of people getting trapped in grain bins and passing away or being seriously injured. It sounds like a no brainer, but number one is to not enter a grain bin. And, I know, I'm aware that sometimes that is not a choice we can make, right. Sometimes something goes wrong in the bin, or you need to, be in the bin for some reason and I understand that. I always encourage farmers, do everything you can from outside first. Don't let the first answer be I'm going in the bin, right? Going into the bin should really be your last resort for whatever issue you're dealing with. And if you are going into a bin, first and foremost, making sure you're not alone. A lot of the incidents that we run into, and fatalities is typically somebody working alone and getting stuck and nobody knowing they're stuck. If you're entering a bin, making sure you have somebody outside the bin who's aware you're in there, you can call for help should something go wrong.

And just as important as kind of a support person being there also having the proper equipment, if you're going into a bin. A full body harness attached to an anchor line is really the bare minimum of protection you should have when entering a bin and the harness is really meant to help with a resting of fall stopping a fall. So, if grain collapses underneath you, it should hopefully help stop the victim from getting completely engulfed in the grain, for me, #1 safety precaution is really trying to avoid it as much as possible. Again, I am aware there are situations where that is the only thing you can do, but then do it safely. Have somebody else, at least one other person, be there, have the proper equipment on you know, and make sure other people in the area are aware of what you're doing. Lock out-tag out is also a good thing to have in these types of situations. Powering down all the equipment and making sure you can avoid any accidental turn ons from somebody that's not aware of what's happening. Again, that's really on the side of preventing engulfment and entrapments.

09:45 E Presnall

And I know a lot of our farmers struggle to find places to buy PPE. So, on the harness side of things, do you know of anywhere that sells that where they could access those types of things?

10:02 E Krekelberg

Yeah, so full-body harnesses are commonly used in other industries as well, so I have found the harnesses themselves are not incredibly difficult to find. You can usually find them from some sort of tool supplier, they're worn by, again, all types of industry folk. So yeah, you can find them at tool supply safety supply anything like that. And if you are curious, you know I have a few that I have purchased just for demonstration purposes and kind of depending on what you get they're going to run about \$100 maybe up to \$200. And making sure you're mindful of the material it's made of what the weight capacity is for that material, all of that. But you should be able to find on it, you know, kind of its specifications and its certifications.

10:51 E Presnall

So, then I just want to talk through some steps that you might want to take before entering a grain bin if it's absolutely necessary, what would you recommend? Are some general steps that farm workers should take to kind of just assess the conditions of the bin before

they enter it, whether it be, the air quality, any structural issues—I know you mentioned lock out-tag out—so those steps might be similar to what you kind of just talked about, but if there's a simple list that they could try and keep in their mind what would that be?

11:25 E Krekelberg

Yeah. So, the first thing I'm going to start with is just saying again, exhaust all of your other options first, I know sometimes it's stuck grain, something that needs to be prodded a little, try to do that from outside of the bin. If you can, right? And then, yeah, if you are going to be entering a bin again, making sure that you have the proper equipment. So, if you are a farm worker, an employee of a farm, you can ask where are the harnesses, is there a harness? And if the answer is no, I say wait till there's a harness available for you. It's so important that we have this equipment on and don't skip that step. PPE is really, in my mind, our last line of defense, right. The last thing we can turn to when everything else goes wrong is the personal protective equipment that we have on as well so, making sure you have that. Again, making sure everybody in the area is aware that somebody is going into the bin having at least one person whose job is solely to be outside the bin, perhaps even kind of talking to and communicating with the person in the bin to make sure everything is running smoothly. And then, I will again say lock out-tag out. Everything should be powered down, right? That's my standard rule of thumb—any equipment on the farm—if you are looking at something on the equipment itself or around the equipment, power needs to be cut completely, and everybody needs to know that it's cut and to not turn it back on. And that's what makes lockout-tagout so nice. If you're not familiar with the process, you basically shut down the power, remove the power source if you can. So, if it's unplugging or shutting down the line and then you put a tag on where you locked out that equipment and everybody does it differently. In most cases, it's a tag that kind of says your name so people know who did it so, then they know, OK, this person has this locked out, so I can't do anything with it because I wasn't the one who locked it. I can't unlock it. So those are really the main steps. I think that we need to consider before we ever step foot in a grain bin is making sure those pieces are in place, do we have harnesses? Do we have enough people to be watching this person's not going in there alone? And do we have a lockout takeout procedure?

13:45 E Presnall

If there is an event where someone is engulfed in the grain or entrapped and after the rescue, what do you recommend that that person do? Because I know a lot of our farmers might be resistant to go and get checked out by a healthcare professional, but as we know there are some adverse health outcomes that could happen following entrapment. So, can you talk a little bit about that and why it's important to go to the hospital and get checked out?

14:18 E Krekelberg

Yeah. So, I will say if an individual is rescued from a grain bin, so rescued, meaning they're still alive, we would say recovered if it's a body, we're recovering. So, if a person is rescued, they are automatically going to the hospital, they will not have a choice and that ambulance will be there to take them once. In most cases, it's the fire department doing the rescue. So, if it's a rescue like that, where emergency services are there, that's an automatic trip to the hospital there. But I would say if you were involved in any sort of near miss or something where, “Yeah, I was buried up to my waist, but, miraculously was able to pull myself out because there was a rope on the side” or something where you think like “oh, I'm OK.” You didn't have to call 911, that doesn't mean you don't have to go to the hospital and should still get it checked out. Because there can be any number of injuries, possible exposure to things. Again, gas, dust, things like that, that can cause pneumonia infection in your lungs. All of those things. And then also, internal injuries. So some people know my background. I have two amputees in my family. We kind of joke in my family, like, OK, if you're missing a limb, you're going to the hospital. Right?

It's not always something on the outside that we can clearly see that's wrong. Sometimes if we don't see anything, we just think it must be fine, but internal injuries are real. And if you are feeling pain or soreness that could be an indication of a larger problem. Now, I want to be very clear, I am not a medical professional, so do not construe this as like set in stone medical advice, this is my advice as a farm safety advocate and educator. Any sort of near miss, even if there's no visible external injury, you should go get yourself checked out and in that same vein, I would add, don't just think about getting checked out in the physical sense. But maybe you need to talk to somebody just about what happened. It was scary, and you need to process some of those feelings. Most hospitals do have, some sort of mental health support on hand. It may not be an actual therapist, may be a licensed clinical social worker, but they have people available. And sometimes that's all you need is just one conversation. It's not a commitment to a lifetime of therapy. They have those of people available on call for this exact purpose, like, hey, this kind of freaked me out.

I just want to talk to somebody a little bit, right. Right. And that's a kind of a no commitment thing that you can take that way. So, lots of options, but I remind people when you are checking out the physical side, make sure you're getting the mental side checked out as well.

17:01 E Presnall

Safety does not have to cost you a lot of money and it doesn't have to be complicated. To summarize what we discussed in this episode, here are some best practices for preventing grain bin-related injuries and fatalities.

To prevent entrapment or engulfment in grain, always lock out and tag out unloading equipment prior to grain bin entry; never work alone in a bin, have someone with you and watching you at all times so they can call for help if something were to happen; and always wear a harness and lifeline when entering a bin. Do not "walk down the grain." For fall prevention when working on a bin, use a fall arrest system or restraint for heights over 4 feet. When working with ladders, remember the 3-4-1 Triangle rule: extend the ladder 3 feet above surface and for every 4 feet of height, place the ladder 1 foot away from the surface. To avoid entanglement in grain handling equipment, always have guards around any moving parts and ensure that guards are not damaged. And again, always lock out and tag out all equipment prior to working on it. To prevent electrocution, lower augers, poles, and ladders to avoid hitting overhead power lines and use lock out/tag out before service or maintenance. To avoid being struck by falling or thrown objects, vehicles, and machines, wear the necessary PPE, such as a hardhat and steel toed footwear; secure overhead objects and transport tools in a secure manner; block tires and raised beds and lock vehicles, hydraulics, and other mechanisms. Lastly, for preventing dust explosions, limit all ignition sources, control the fire elements, and perform maintenance and housekeeping regularly.

The Great Plains Center website has a resource page on grain bin safety—with a lot of useful information on measures to prevent engulfment and entrapment in grain—including risks and dangerous scenarios to avoid, zero entry procedures, planning for necessary entry, and lifeline system set-up. Visit gpcah.public-health.uiowa.edu/grain-engulfment-and-entrapment, or view the link included in the resources for this episode.

19:34 E Presnall

For this week's episode, I encourage our listeners to visit the grain handling safety coalition's website— www.grainsafety.org. The Grain Handling Safety Coalition has a lot of great resources for improving safety around grain on the farm. Take a look at the handouts that are under the resources page. Under the resources for this episode, I have included a grain storage structure entry procedures checklist. Print this out and post it near the grain bins on your farm. I would also encourage you to print out the Job Safety Analysis and Risk Assessment handout included in this episode's resources. This is a simple way to begin thinking about the hazards on your farm and it can give you a place to start making changes based on the level of risk when wanting to improve safety.

20:24 E Presnall

Listen in on the *FarmSafe* Podcast to join in on the conversation about keeping safe on the farm.

We want to hear from you. Share your stories about health and safety issues on the farm, about injuries that made you change the way you work, or about the ways you keep yourself and others safe on your farm. Also let us know if there's questions you have or topics that you want to hear about on the air. You can visit our website, gpcah.org, or email us.

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Episode Resources

- [Grain Engulfment and Entrapment](#), GPCAH
- [Grain Storage Structure Entry Procedures](#), Grain Handling Safety Coalition
- [Job Safety Analysis and Risk Assessment](#), Grain Handling Safety Coalition

Photo

