

[Andy Chamberlin] Welcome! This is the "Ag Engineering Podcast" where we talk tools, tips and techniques to improve the sustainability of your farm. I am your host, Andy Chamberlin from the University of Vermont Extension. And this podcast is supported by Northeast SARE, providing grants and education to advance innovation in sustainable agriculture. We're trying to improve the industry by chatting with farmers and getting their input on tools, tips or techniques that have changed the way they farm for good. Many of these practices affect multiple areas of the farm, whether it be environmentally, emotionally, physically or financially. We share the knowledge to promote sustainable agriculture, lifestyle and business. Thanks for having a listen. Now, let's get started. So today's episode is a solo episode with just me again where I'm sharing with you a resource that we just put out called, "Improving Handwashing Stations". Now, a full PDF is available of this blog post if you visit [go.uvm.edu/handwashingstation](http://go.uvm.edu/handwashingstation). Now, handwashing has been shown to be one of the most effective ways to reduce the risk of transmission of human pathogens between people. But, sometimes we are inconveniently far away from the closest washroom and sink. Handwashing stations provide a portable means of washing hands on farms, at farmers' markets and at recreational sites. This guide was motivated by a desire to improve the current handwashing station practice with a focus on minimizing, or even removing, all contact between the user's hands and the surface of the station. So some key design features of a hand wash station include a clean supply of water that is safe and adequate sanitary quality. Hands-free operation of water. This allows thorough washing of hands with full attention and also prevents cross-contamination via a faucet handle and other surfaces. Gray water collection for controlled disposal to prevent direct discharge of used water on the ground in order to minimize cross-contamination and pollution. Hands-free dispensing of soap to avoid cross-contamination. Touchless or low contact paper towel dispenser to prevent cross-contamination. A paper towel receptacle with a liner and closing lid to ensure waste is contained. Sturdy construction. So, leading to durable use over the lifetime, consider weather-resistant materials or paint to prolong the life of the unit. It should be a stable design so it won't tip over and which keeps parts intact. It's gotta be portable so that it can be easily moved to where it is needed, easy to maintain so that it remains useful and pleasant to use. And cleanable in itself so that the handwashing station itself can be kept in a hygienic condition. Surfaces should be smooth and cleanable and materials should be compatible with water and soap. Now, stations destined for farmers' markets and pick-your-own stands may also want to consider design characteristics that are family-friendly. So example, having the proper height or stool available that ensures a child could use the station with little to no assistance. Also to take into consideration is ADA compliance and otherwise designed to allow improved access and use by those with physical disabilities. Now, the CDC provides five steps to wash your hands the right way. Washing your hands is easy and one of the most effective ways to prevent the spread of germs. Clean hands can stop germs from spreading one person to another and throughout the entire community, from your home and workplace to childcare facilities and hospitals. Follow these five steps every time. One, wet your hands with clean, running water, warm or cold. Turn off the tap and apply soap. Two, lather. Lather your hands by rubbing them together with soap. Lather the backs of your hands, between your fingers and under your nails. Three, scrub your hands for at least 20 seconds. Need a timer? Go ahead and hum "Happy Birthday", sung from the beginning to end twice. Four, rinse your hands well under clean, running water. And then five, dry your hands using a clean towel or air dry them. So, let's put all this into practice. Chris Callahan and I scratched our heads and brainstormed together how we can accomplish these things. How do we make a handwashing station that's hygienic, hands-free, something that's not gonna contaminate and spread germs or diseases from one person to the next by a couple design elements? What's something

that can be cheap and easy to build? Something that may or may not require much construction or tools to assemble. What's something that's affordable, readily accessible and easy to move around? We came up with two approaches. And one of them is kind of a DIY to assemble cart, like a handwashing station cart. The other one is a little bit more of a stationary hand wash stand. Now, Chris and I figured out how to do this for under \$200. And now, the basis is having hands-free soap dispenser, a spring-loaded spigot valve down to a foot pedal yoke. So you step on a cable, or you step on a board that pulls a cable, which then pulls the trigger of the spigot. Now the spigot we have is on a five gallon jug of water. And that spigot is much like a coffee urn or like a lemonade pitcher. And we drill a little hole in it and then use a spring clip, like a carabiner style or a dog leash type clip, onto a hole in that spigot. So when you step on the pedal, it pulls the cable which then pulls the handle of the spigot. Therefore, it dispenses water onto your hands. The next thing is we have a basin to catch that water. Now ideally, we were looking for something like a large funnel but oddly enough, funnels get really expensive, really fast. But we found like an oil drain pan or a bus tote, you know, like a restaurant supply, worked well for these uses. And then that can have a hole drilled in it and you can use a barb fitting or an adapter so it drains into a tube. And then once it's contained in that tube, you can drain it down into a bucket or another water tote to capture that water so it's not just dribbling all over your feet. And then you can properly dispose of that where it makes sense. Another important thing is the hands-free soap dispenser and hands-free paper towel dispenser. We tried to find commercial options, but part of the reason why we're doing this is we're in the middle of the COVID-19 pandemic and commercial soap dispensers were really, really hard to find online or really not cost-effective. They're super expensive if we could find them. So, we ended up selecting a residential unit, something you'd use in your bathroom. A little bit smaller scale than ideally what we'd want for something at a farmer's market or on a farm, but it works. You know, it's a little bit slow. You gotta get your hand really close to the sensor and kinda wait a second longer than you think you should have to and then it dispenses the soap. So it works but it's not quite as nice as a commercial unit might be. And most paper towel dispensers are kind of, in design, hands-free. You don't always have to pull a lever. If you get the ones that just dispense the towels out the bottom, you can either, you know, pull that c-fold type, shape towel out or those that are kind of like a toilet paper roll and then it pulls out from the bottom, more like a tissue box upside down. So that again, is hands-free where the only thing you're touching is the paper towel you're using. So, there's that. And then you could use a foot pedal trash can as well to capture this and again, keep it hands-free. We've got two designs here that we've put together. One is a purchased cart. So I used a wire rack cart. It was only about \$50 and it came with wheels. The shelves are adjustable height. So all I have to do is assemble this cart, use a rubber strap to secure the water tank to the top and then install that cable down through a couple eye hooks and secured a pedal, a little wooden pedal, with some zip ties to give you something to step on. Now, initially we thought of using like a stirrup design so the cable would come down and kinda loop to itself to make a loop to step in. But then we found that spun around and didn't work very good. So we came up with a little bit wider design so it attaches the pedal or the yoke on both sides and that seemed to work really well. And I know this is a little bit hard to picture by me just describing it so I recommend you check out the blog post online and the fact sheet so you can see what I'm talking about here if you're interested in building a hand wash station for yourself. Now, this method is all, you know, put together by different components and really no building, just a couple hole drills, hole drilling is required. So that's a benefit there. Chris went ahead and broke out the saw and made a unit, a stand, with two by fours and some plywood. Works great too, probably takes a little bit longer to assemble. Again, it's an afternoon project and takes a bit more skills with wood and decking screws and then the

extra time to paint it so it holds up well. But, it's definitely a robust option and a little bit cheaper than buying a cart, per se. I'd like to point out that we've got building materials, pictures, prices, and links all posted in this fact sheet as reference material. So you can basically see the image, have your shopping list right in front of you and get stuff at the local hardware store, minus a few things that we ordered online to be specific. How much can I say about a handwashing station? I'd recommend you visit the blog post. You can visit the show notes at [agengpodcast.com](http://agengpodcast.com) and I will link to the blog post write-up where it has the diagrams and pictures of what we're talking about here. Our own extension, UVM Extension, has a TV show where they put out called, "Across The Fence". And they actually did an episode on this where they interviewed both Chris and I demoing this unit and explaining the reason why. So, if my voice wasn't enough for you, you can visit that episode and hear from Chris as well, explaining a little bit more of the why about handwashing stations and how we came about the design principles that we did. Again, those will be linked in the show notes so check it out there. I hope your season's off to a good start and everybody is staying safe. So this is just a reminder to wash your hands. And if you are looking for an idea for a portable handwashing station for your farm or farmer's market, we've got a resource available. So with that, I hope you have a great day and thanks for listening. If you learned something today or plan to make a change on your farm, let me know. I'd love to receive any feedback you have. Just click the link in the description to submit the form. It will help the future of this podcast to be a resource that is helpful for you. And while you're at it, I hope you go ahead and subscribe. Share this with a friend or leave a comment. And if you want more information, check out the show notes on our website at [agengpodcast.com](http://agengpodcast.com). That's A, G, E, N, G, P, O, D, C, A, S, T.com. Thanks for listening and I hope you have a great day.

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