DIY Stair Lift

Tired of carrying hundreds of quart jars and more up and down basement stairs, Norm Sieting built his own stair lift. With garage door tracks mounted to the steps and a winch under the steps, the lift does the hard work.

"My wife put up 84 quarts of apple juice alone last year. That was 11 trips up and down the stairs," recalls Sieting. "We have a big garden, and we can a lot of fruit and vegetables. Then there are the two freezers and a refrigerator that we fill. Our washing machine and dryer are also in the basement."

Sieting is an active 78-year-old, but he knows the day will come when the stairs will likely be even more challenging. He made the platform of the lift 18 in. wide and 22 in. deep, with four wheels that ride in the track.

"It holds three rows of canning jars and is big enough to hold a chair," says Sieting. "I don't have to ride it yet, but the day will come."

The depth requires the platform to span two stairs in depth and height. "I had to build a false step at the bottom so we can step off the platform to the floor," says Sieting.

The two biggest challenges to installing the chair lift were mounting the 2,500-lb., 12-volt Harbor Freight winch and battery under the top of the stairs and obtaining garage door opener tracks.

"It was a tight fit to place the winch, with ductwork from the furnace and a washer and dryer under the steps," says Sieting. "However, the hardest part was finding the tracks. No dealer would sell me either new or used track. Finally, a friend gave me a set of tracks."

Sieting quickly discovered that the tracks, spliced at 8 ft., didn't run smoothly. Luckily, his friend had a set of 12-ft. tracks, enough for the full stair run.

With the tracks mounted to either side of the stairs and the winch in place, Sieting added a hard-wired remote for the winch. The cable is long enough to be used at either end of the stairs. When not in use, it hangs at the top of the stairs with the lift platform at the bottom. A Harbor Freight battery tender keeps the battery charged.

"The winch cable runs down the center of the stairs with plenty of room for our feet to either side," says Sieting. "If we step on it, it just moves the platform a little until we step off it."

Stair lift view from top of stairs.

Lift battery and winch under stairs.

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The solution expands 50 times as it mixes before being delivered to row units, and using air as a carrier reduces water use by 90 percent in a traditional liquid system.

Low-Volume Precision Application System

FMC's 3RIVE 3D pesticide application system lays a foam band around the seed in the furrow at planting. FMC calls this a Zone of Protection. The foam can include an insecticide or both insecticide and fungicide.

"3RIVE (pronounced thrive) 3D is very low volume, using only 40 to 60 oz. of water and chemicals per acre," says Marcus Bartlett, FMC. "We use air as a carrier to produce a band of foam the size of a number 2 pencil."

"The 3RIVE 3D system has two tanks, one holding 130 gal. of water and the other holding 30 gal. of chemicals," says Bartlett.

Other components include pumps for each tank, a precision flowmeter, an air compressor, and associated plumbing and wiring harnesses. Planters larger than 24 rows require two air compressors.

The system delivers precise amounts of air, water, and chemicals to the sprayer manifold. The solution expands 50 times as it mixes before being delivered to row units, and using air as a carrier reduces water use by 90 percent in a traditional liquid system. The carrying weight of the two liquids is half that of a granular system.

FMC provides the system to customers who commit to using it on at least 1,500 acres per year for 3 years. Bartlett explains that the customer owns the system after applying FMC products on 4,500 acres.

"The 3RIVE 3D system is available through any FMC dealer," says Bartlett.

Since its introduction 7 years ago, 3RIVE 3D has proven most popular in the Midwest, with more than 85 percent of usage on corn acres. Unlike traditional application systems, water and chemicals are transferred to the 3RIVE 3D system through quick-connect, dry-lock valves. No measuring, mixing, or tank agitation is needed.

"3RIVE users are still advised to follow best practices, but as a closed system, it takes a lot of risk for growers out of applications," says Bartlett.

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"There's a sleeve which travels up and down the shaft," Wutzke explains. "This allows the grapple arms to fold flat when driven into the culvert and through the blockage."

Student Creates Culvert Cleaner

DIYers understand the satisfaction of creating something new to solve a problem, and Micaiah Abramson experienced that as a high school sophomore. The culvert grapple hook he made in welding class pulls sticks out of some plugged culverts in his county. The project was part of a collaboration between Fergus Falls High School and Otter Tail County in Minnesota.

An abundance of beavers creates problems in the county, explains Colby Palmersheim, drainage inspector. In addition to trapping as many as 200 beavers/year, contractors are hired to remove 20 to 30 dams that create problems. Plus, there are plugged culverts.

"We have to hire contractors to use a water jet or excavator. I had the idea to have something available (in my pickup) to take care of it in a matter of minutes," Palmersheim says.

He made a CAD drawing and contacted Dennis Wutzke, who teaches welding at the high school, about making it a student project.

"Micaiah has a fantastic engineering brain and is meticulous about making his work function and look right. He needed a project, and he got excited because it was something that actually had a purpose," Wutzke says.

As a teacher, he assisted and brainstormed with his student but allowed Abramson to work out the details, starting with a long pipe with a sharpened head that looked like a long spear. The challenge was to create something that opened up and stayed open after the shaft was driven into the plugged culvert. Then, a winch on a pickup pulls the device and sticks and debris out of the culvert.

"There's a sleeve which travels up and down the shaft," Wutzke explains. "This allows the grapple arms to fold flat when driven into the culvert and through the blockage. Currently, the device is around 4 to 5 in. in diameter. Once it's through and being pulled back out, the sleeve travels down the shaft thus extending the grapple hooks and hooking the sticks as it's being pulled out. Now it has an 18-in. dia. reach."

After building a prototype with scraps in the school's shop, Abramson created the final grapple hook with heavier pipes and steel, using many of the shop's tools—a handheld plasma torch, MIG welder, milling machine, and oxyacetylene torch.

He spent about 45 hours on the project overall, and he saw it work successfully in culverts at the county's maintenance shop plugged with sticks for the test.

"It was fun to build and test the whole process. I like to use my hands and brain to solve problems," Abramson says. "No one's made this exact thing, like this."

The grapple hook is in two sections, 8-ft. and 10-ft., which Palmersheim can haul in his pickup. It works best on 24 to 36-in. diameter culverts. He says it doesn't work on mud-packed culverts but is effective for sticks.

Grapple shown folded flat to drive through blockage.

The challenge is that the tool needs to be pulled out level to avoid bending the culvert or the hook. And there's not always a tree or anything to fasten the winch to, Palmersheim says.

"We may need to make a ground anchor," he notes.

That might be a project for Abramson or another student this fall.

"I love it when kids can produce something of value with community/school partnerships. It allows the students to see through the whole process and use their own minds," Wutzke says. He adds he's grateful for the local manufacturers that keep the school shop well stocked with all kinds of steel.

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