

Made-It-Myself Shaft Clears Out Tree Roots

Discovering tree roots in his well casing, Roy Sims cleared them out with the help of some rebar and a cutting bit. The problem became apparent when he tried to pull his submersible pump.

"We were using a half-ton winch on the water pipe, and when the pump hit the root mass, the plastic pipe broke," recalls Sims. "We had a rope on the pump, but we just let it fall back down."

Sims used rebar as a stem for a cutting bit suspended from a winch to clear the root mass. He turned the bit with his 1,000-ft. lb. impact wrench. He ordered the cutting bit online, but the rest of the device was fabricated with rebar destined for a porch foundation.

He first fabricated a rectangular suspension frame from rebar and welded a large washer with a 1/2-in. interior diameter hole to it. The winch would attach to the frame. He then welded a matching washer to the end of a short length of pipe and slipped it over a 10-ft. length of 1/2-in. rebar, washer first. Welded to the rebar, the facing washers (well-greased) would allow the cutting bit stem to turn.

The final step was to weld the cutting bit to the end of the rebar and a 1/2-in. drive for the impact wrench to the pipe end. He reinforced the connection to the bit with short lengths of rebar welded over the joint. Inserted into the 4-in. dia. well casing, the 10-ft. cutting bit hit no roots. Sims then cut the rebar in two and inserted another 10-ft. length of rebar. He repeated the process until he reached the root mass at a 36 ft. depth. He reinforced the welding graft each time, overlapping the rebar by 4 to 5 in. lengths and welding both sides.

"I didn't want it to come apart in the well," says Sims. "As it was, the rebar had enough flex that the 3-in. cutting bit wandered around inside the 4-in. casing and cleared it completely."

As the cutting bit chewed into the root mass and cleared the latest 10-ft. section, Sims pulled it out and added another section. At 66 ft., he reached a clear pipe.

He recalls the first roots he encountered as being very hard to chew through. When he withdrew the cutting bit, it was covered



Cutting bit/rebar joint.



Root-cutting suspension frame.

in fine root hairs. He's confident the roots came from a nearby pecan tree with an 8-ft. circumference.

"I cut it down," he says. "I wasn't going to do this again."

That said, he has kept the cutting bit and suspension frame. He also cut apart the rebar stem and retained the pieces...just in case.

While the device worked well, he plans to try a different driver if he does the job again. "I think I would try to use my gas-powered, one-man post-hole auger," says Sims. "It has more power than the impact wrench and wouldn't need a portable air compressor like the wrench."

Contact: FARM SHOW Followup, Roy G. Sims, 31044 Caddo Rd., Anadarko, Okla. 73005 (ph 405-933-2943).



Heartland Ag Tender auger rotates 270 degrees.

Speedy Tender Unloads To Either Side

The VPA 1000 has a 30-ton capacity and can unload up to 5,000 lbs. per min. Rated at 43 percent faster than standard unloading speeds, the variable position auger has a dual chute auger design with multiple features.

"The fast unload rate has been very well received by our customers," says Andy Young, Heartland Ag, a division of Titan Machinery. "However, the versatility of discharging and storing the auger to either side of the tender is also appreciated."

The fully sealed slew drive worm gear system raises and rotates the auger into position across a 270-degree range. Young explains that the slew drive allows the auger to move from one side to the other. When unloading is complete, the 22-ft. auger breaks with the upper end, rotating into cradles on either side.

Other aspects of the auger that have captured prospective users' attention include hydraulic cam valves that automatically stop hydraulic flow when rotated to stop and prevent rotation of the auger when it's in its cradle.

"Multiple cams valves at different points on the tender ensure a stored auger won't rotate away from the tender and crash into a bin or other equipment," says Young. "A cam valve also prevents it from over-rotating and causing damage."

A unique auger connection system eliminates leakage and product buildup common in two-piece augers. Also unique are the 50-degree sides of the six-compartment



VPA 1000 shown in cradle position.

bin. They provide faster and more complete cleanout than the more common 40-degree or less bin sides.

"Steeper sides mean less need to get up in the bin when unloading while eliminating the need for vibrators to release material," says Young.

A quick-attach pit dump system option adds greater versatility. Hydraulic hardlines run the length of the trailer and unloading auger.

The custom-designed hydraulic manifold with integrated pressure gauges, relief valves, and control modules improves operator control. If hydraulic pressure is lost or the control lever is released, an integrated brake system secures the auger in its cradle. Young suggests contacting the company for pricing.

Contact: FARM SHOW Followup, Titan Machinery, 1180 State Hwy. 7 E., Hutchinson, Minn. 55350 (ph 320-587-4030; <https://www.titanmachinery.com/heartland-ag-systems-equipment-vpa-1000-tenders>).

Building a Cost-Effective Solar Air Heater

If you have a south wall, you can utilize it as a source of free solar heat. Solar air heaters are most cost-effective when incorporated into new construction but can be simple to add to existing buildings.

This passive heating system, known as thermosiphon, utilizes natural convection to circulate fluid without a mechanical pump. Instead, it relies on the buoyancy of heated air to create circulation through a collector. These collector systems are simple and virtually foolproof. You don't have the cost, maintenance, or power requirements of other heating systems' fans, sensors, or controllers. There's little that can go wrong once they're up and running. You'll also get an excellent economic return by minimizing other fuel, and it's possible to adjust the temperature if things heat up more than expected.

On the negative side, solar collectors require the sun to work. If you live in a cloudy region, backup heat may be necessary. Likewise, the building might require more thermal mass and insulation to prevent heat loss at night.

Gary Reysa, writing for Mother Earth News about his homemade thermosiphon setup, reported that it could produce the heat equivalent of \$2 of propane (in 2006 dollars)

on sunny days in Bozeman, Montana.

His thermosiphon collector consists of clear, corrugated polycarbonate panels fastened to 2-in. by 6-in. studs. The panels let in sunlight, and an absorber suspended inside warms, expands, and rises in response, which creates a convection current. The top and bottom vents allow air circulation, so cool air enters through the lower vents, gets heated by the absorber until it rises to the upper vents, and returns to the interior, similar to a lava lamp. This process continues for as long as the sun heats the collector. Nighttime temperatures reverse this airflow as the collector cools to outside temperatures. However, simple flapper valves on the top vents can stop the circulation from reversing and keep the heat inside.

Reysa reports that the collector raises indoor temperatures to between 60 and 75 F on sunny winter days, 25 to 35 degrees above outside temperatures. However, it barely nudges the temperature up on cloudy days. You can also expect it to take at least 3 hrs. to heat the interior temperature from freezing to over 60 F. Note that this heating system only works well in spaces with adequate insulation. Solar collectors fall short of heating drafty spaces.



Photo courtesy of Mother Earth News

Passive solar air heater uses natural convection to circulate fluid without a mechanical pump.

The complete project took Reysa 3 working days. He minimized costs by integrating the collector within the building structure and using materials on hand, bringing the overall cost down to about \$350.

From a heating efficiency standpoint, the larger the collector, the better. Costs don't differ much between using a small portion

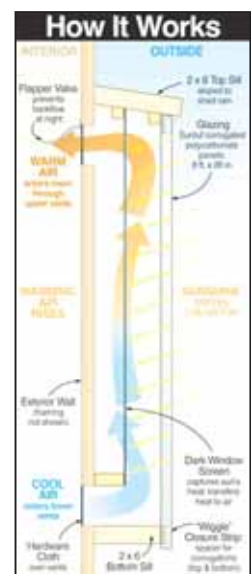


Diagram shows working of solar air heater.

of a wall or most of it. A larger size also helps counteract heat loss on cloudy days, and upper vents can be adjusted to prevent overheating.