



Machine built by Dick Harris uses deep ripper shanks that mount in front of planter row units. Big tires tamp down the soil to keep the surface smooth.

## One-Pass Row Crop Tillage Machine

"It reduces the number of trips needed to plant a crop which saves fuel, prevents soil erosion, and breaks up soil compaction in the row area. It also loosens up the root zone which results in better yields," says Dick Harris, Harris Co. Inc., Mineral, Va., who recently sent FARM SHOW photos of a one-pass row crop tillage machine that he has been testing.

The machine uses deep ripper shanks that mount in front of planter row units. So far, he has used a 2-row prototype to plant corn. "We need to test this machine in many different crops, especially those that respond to subsoiling, such as cotton," says Harris.

Wide tires - two per row - support the machine. A deep ripper shank digs down into the soil under the rear half of the front tire. As the machine is pulled over the field, the tire pushes over and holds crop material and also holds the soil down as the shank passes through it. The tire prevents the soil from flying upward, sometimes in big chunks, as the

shank is pulled through the soil.

"Soil flows out from behind the tire like a heaved-up blanket. This leaves soil in the shank area broken up as deep as the shank is set, yet the top area of the soil where the seed will be planted is kept mostly intact and in much better condition to plant in," says Harris. "It works kind of like no-till, yet the soil is broken up directly under each row down deep, which is something that no-till doesn't do."

Harris says he hopes to test the machine in many different crops, especially those that respond to subsoiling such as cotton. "One time we used the machine in a rainfall runoff test, comparing it to conventional tillage and no-till. Sediment loss for this machine was 85 percent less than conventional tillage and 51 percent less than no-till," he notes.

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Jack Vernon's portable pneumatic windmill folds down for transport on a 2-wheeled trailer, allowing him to transport the windmill at highway speeds between remote pastures.

## Portable Windmill Sets Up In 15 Minutes

"It gets a lot of looks whenever I pull it down the highway," says Jack Vernon, Lakeview, Oregon, about his home-built, 23-ft. high portable pneumatic windmill. It folds down for transport on a 2-wheeled trailer, allowing Vernon to move the windmill at highway speeds between remote pastures.

"As far as I know, it's the only windmill on wheels. One person can set it up or take it down in only about 15 minutes," says Vernon, who built the windmill two years ago. He has about 400 cows and calves on his ranch with five wells scattered up to 20 miles apart. "I can set my windmill up and use it at one well until the pasture is grazed out, then take it down and move it to another pasture. It's a lot less expensive than buying three or four conventional windmills that I would probably use only 60 days a year.

"I built it mostly out of old components that I already had. My total cost was about \$600. A commercial portable 3-bladed windmill with comparable pumping capacity would sell for about \$3,500 and take a half day to set up or take down."

He started with an 8-ft. dia. fan off an old windmill and a 1-cyl. compressor that he already had. The fan, driveshaft, and compressor all mount on a steel plate that bolts onto one end of a floating axle off a 3/4-ton pickup. He cut the axle just behind the brake backing plate, and then stripped the hub, brakes and backing plate off. A short length of sq. tubing was welded to the shortened axle. It pins to the mast.

The fan mounts on a short shaft with pillow block bearings, and is bolted about 4 in. to the left of center as you look at it from the back. The fan chain-drives the compressor and is geared up via the combination of a 32-tooth sprocket to a 9-tooth sprocket on the compressor.

The air line runs down through the center of the axle to a 3-gal. air tank that mounts on the trailer's tongue. The air "brake" tank evens out surges in air pressure from the compressor caused by high, gusting winds. A 60 psi pop-off valve and a one-way back stop valve are used to regulate air pressure in the tank.

The windmill's folding tail is modeled after an auto furling design made popular by Hugh Piggott ([www.scoraigwind.com](http://www.scoraigwind.com)). It uses weight and gravity to turn the mill out of high winds, and is mounted 3 in. to the right of center.

The windmill's mast consists of a 12-ft. long hydraulic cylinder off an old Farm Hand F-10 front-end loader. It pins to the front of the trailer frame. He pulled the cylinder out 3 ft. and then welded it in place. A 1-ton hand-operated winch on front of the trailer is used to raise and lower the mast. Cable from the winch goes over a pulley on a gin pole at the front of the trailer. Metal guides extend from



"One person can set the windmill up or take it down in only about 15 minutes," says Vernon.

the gin pole to a "tower rest", and keep the mast stable when raising or lowering it in high winds.

Tie-down winches are welded to the back of the trailer, allowing support cables to the tower to be quickly tightened. Four 5-ft. long fold-up outrigger braces on the trailer can be lowered to the ground, keeping the windmill stable in high winds.

To set up the windmill, first he puts down the outriggers on the trailer. Then he uses the winch to crank up the tower and chain the mast to the gin pole. The support cables are then tightened. The last step is to plug the windmill's air hose to the well pump, and to hook a water hose up to the stock tank or storage tank.

"Both the air lines and water lines have quick couplers, so we only need a 7/16-in. wrench to tighten the U-bolts on the ground stabilizing arms. The rest is secured with pins," says Vernon.

He built his own diffusion pump out of a length of PVC pipe. The pipe has a series of holes drilled into it, with the air line going down and then coming up inside the water line for 3 ft., and from that comes back to the surface. He found the plans for the pump on a Canadian Pasture Management website ([www.quantumlynx.com](http://www.quantumlynx.com)).

"The pump can produce up to 17 gpm in a 25 mph wind. People who see it for the first time can't believe how much water it can pump," says Vernon.

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Derald Brown equipped his Yamaha 200 ATV with a dumping rock hopper and an operator platform that lets him sit just inches off the ground.



## Rock-Picking "Sidecar" For ATV's

Picking rocks is almost fun for Derald Brown since he equipped his Yamaha 200 ATV with a dumping rock hopper and an operator platform that lets him sit just inches off the ground.

The platform is on the right side of the ATV. Brown steers and accelerates with his left hand and grabs rocks with his right hand. He tosses the rocks across the ATV into the hopper on the left side. When the hopper is full, he drives to the edge of the field to dump it.

Brown used scrap to make the platform, which rides on two wheels and attaches to the front and rear cargo racks.

To control the ATV, Brown connected a bar to the tie rod and ran it through a couple pivot points to the platform. He attached the thumb throttle to the steering handle so he can drive with one hand.

The plywood rock box rides on an angle iron frame. It's 3 ft. long, 1 ft. wide and about 18 in. deep. It rides on an 8-in. wheel and hinges on the side next to the ATV.

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Platform is on right side of ATV. Brown steers and accelerates with his left hand and grabs rocks with his right.



He tosses the rocks across the ATV into hopper on left side.