# Cover Crop Roller Helps Organic No-Till Work

A new cover crop roller developed at the Rodale Institute may change how organic and non-organic farmers plant crops. It crushes cover crops to create an ideal surface for no-till planting.

"We've been working on systems for using cover crops in organic production for about 15 years," says Jeff Moyer, farm manager, Rodale Institute. "We believe the cover crop is the most important crop on the farm. If it does well, nitrogen management and weed control do well."

Cover crops build fertility and control winter annuals and other out-of-season weeds. Unfortunately, cover crops must either be sprayed with herbicides or plowed under.

Moyer reports that people have tried different systems, such as the Buffalo Stalk Chopper, to crush cover crops. Some don't work without herbicides, while others are too aggressive and expose soil for weed seeds to germinate. Pull-behinds often don't affect plant material in wheel tracks. Rollers with straight blades across the cylinder tend to bounce, leaving cover crop plants unaffected.

Even if a cover crop was successfully rolled, planting into it was difficult at best. Row markers didn't work in the heavy mulch, and planting had to be in the same direction the roller went.

Moyer decided they needed a device that was front-mounted and sized to match 4-row equipment.

He and John Brubaker, a neighbor experienced in metal work, designed and built a roller that appears to meet Moyer's goals. The single 10-ft. 6-in. long, 16-in. diameter cylinder requires only two bearings and can be filled with water for added weight as desired. Cutting blades are mounted at an angle, bending toward the center from either end. Blades are attached to the cylinder at less than a 90º angle.

"Twisting the blades toward the center eliminates the cylinder bouncing as it would if they were straight across," explains Moyer. "If they were twisted in just one direction like a screw, it would pull the tractor in that direction. By twisting into the center from both sides, it eliminates that pull."

Brubaker suggested setting the blades at an angle to the cylinder after noticing how cleats mounted at 90º on a steel wheel will kick up soil. "If they are at an angle, they lift out of the soil without tearing up it or the cover crop," notes Moyer.

The first step was to pre-bend the 1/2-in. thick, 4-in. rolled steel blades to achieve the less than 90º angle. Then they laid a string along the cylinder to get the arc or twist they wanted. Each arc was approximately 14 in. from the previous arc.

The next step was to weld 1 1/2-in. pieces of angle iron to the cylinder every 8 in. along the desired arcs.

"We secured each blade at one end of the cylinder and then used a pipe wrench to yank the other end to where it could be secured," says Moyer. "We then went along and drilled holes in the blade to line up with the angle irons."

**Roller crushes crop to prepare no-till seedbed. And if the cover crop goes well, nitrogen management and weed control go well, too.**

Square holes were punched through the plates to allow the use of carriage head bolts. In plot tests this past season, the unit worked perfectly, reports Moyer.

Moyer and his team are planning to do more extensive fieldwork this spring. They will be working with a 2-row vacuum planter with double-disc openers modified to four 30-in. rows. He also hopes to use it with a grain drill for narrow row soybeans.

Contact: FARM SHOW Followup, Jeff Moyer, The Rodale Institute, 611 Siegfriedale Rd., Kutztown, Pa. 19530 (ph 610 683-1420; email: jeff.moyer@rodaleim.fp.org; website: www.newfarm.org).

**Twisting blades eliminate pulling so the tractor stays more on course.**

**Portable pto works for anyone without a tractor or who has more pto work than they can handle. Benjamin used a diesel, but a smaller model could use an electric motor.**

# Portable PTO Power Unit

Harry Benjamin, Shelby, Montana, recently sent FARM SHOW photos of a pto power unit that he built for a neighbor, using components off an old Massey 750 combine.

The two-wheeled trailer is equipped with a Perkins 6-cyl. diesel engine, which belt-drives a 1,000 rpm pto shaft. The engine has about 200 hp and runs at 2,000 rpm's. A series of belts and pulleys are used to gear the pto down to operate at 1,000 rpm's. The controls and gauges mount next to the engine. There's a hitch both on front and back.

"The owner is a farmer who sells grain vacs as a sideline business. He travels to farms with a demonstration model and hauls the pto power unit and grain vac behind his pickup," says Benjamin. "When he gets to the customer's farm, he pushes a switch to start the engine and then flips a lever to engage the pto. He never has to unhook the grain vac from the pickup. Then when he's done with the demonstration, he gets in his pickup and drives off. There's no need for a tractor at all. He even uses this machine on his own farm to clean out grain bins.

"I think the same idea would work for anyone who doesn't have a tractor equipped with a pto, or who doesn't want to tie up their tractor. Grain vacs require a lot of power so this rig works great. But a smaller model could be built using an electric motor."

Besides the combine engine, Benjamin also used the combine's fuel tank, radiator, muffler, and air cleaner. A surge tank mounts above the radiator and supplies the cooling system. The wheels and axle were salvaged from a mobile home. He used 2 by 6 sq. tubing to build the frame and running gear.

Contact: FARM SHOW Followup, Harry Benjamin, Triangle Pipeline Co., L.L.C., 205 S. Devon Rd., Shelby, Montana 59474 (ph 406 432-2196 or 406 460-2196).

**Shop-made doors cost Wierenga $4,000 less than an overhead door.**

# Barn Modernized With Low-Cost Bi-Fold Doors

When Louis Wierenga set out to save his 100-year-old barn, he modernized it by building and installing 25-ft. high, 22-ft. wide bi-fold doors that open from the side. The doors are big enough that he can drive a combine in.

The Pinconning, Mich., farmer used materials that he already had to build the doors.

"We saved more than $4,000 over what a smaller version of an overhead-type door would have cost us, not including the cost of a powered door opener," says Wierenga.

Wierenga also removed the barn's hay loft and made about 75 percent of the length of the barn "clear span" to a height of 18 ft., installing the bi-fold doors at one end.

To build the doors, he made four 18-ft. long by 5 1/2-ft. wide panels in his shop, using 2 by 6's to build the frames and covering them with the metal sheeting. He used lengths of 1/2-in. dia. steel rod to brace each panel from the top corner to the opposite bottom corner. Door hinges were made using flat steel and 3/4-in. thick wall tubing, which was milled out to accept hinge pins made from galvanized bolts. A track was then installed above the door opening.

The doors were loaded onto a truck and hauled to the barn site. At the barn, the doors were unloaded, opened to their 11-ft. widths, and pulled up into place using a cable.

A metal-roofed awning was built above the doors to keep rain and snow off anyone entering the door. To build the awning, Wierenga nailed triangle trusses onto the barn wall and covered them with painted barn steel.

Contact: FARM SHOW Followup, Louis F. Wierenga, Jr., 1132 E. Coggins Rd., Pinconning, Mich. 48650 (ph 989 879-2248).