

# Rotating Culvert Turns Waste Into Compost

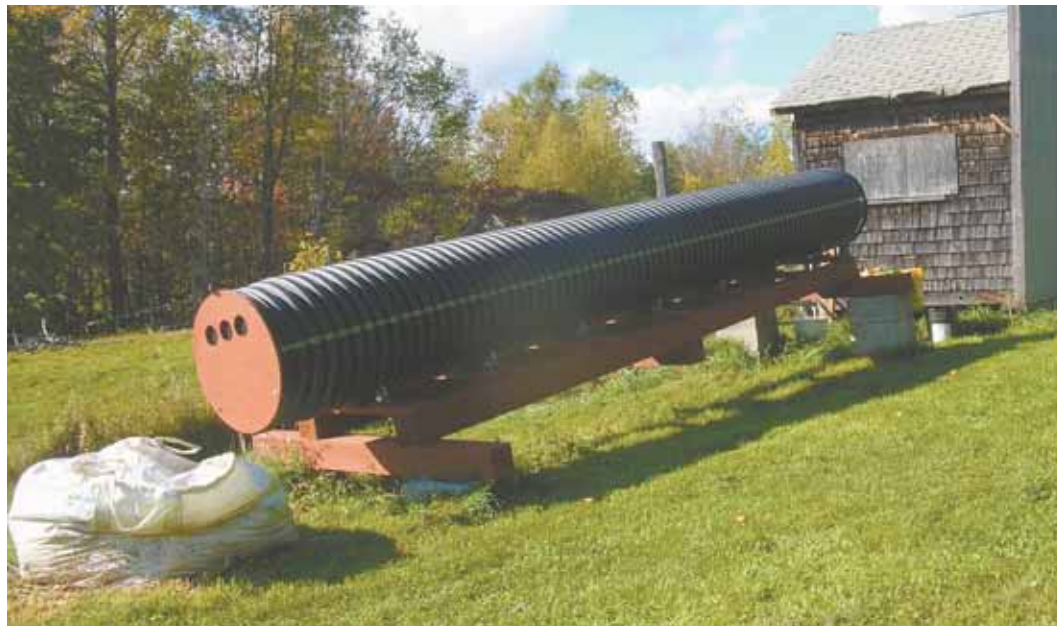
Ron Harwood's 2-ft. dia., tubular composter is a culvert on wheels. Set at an angle that falls 2 ft. over its 20-ft. length, daily turning aerates the compostable materials and moves them slowly toward their finished state.

"The incline moves the organic material being composted and also encourages convection of the air to keep the material oxygenated," explains Harwood. "If it is too steep, the material moves too fast to fully compost."

Harwood and his wife Melissa operate a small Maine farm where they raise a few animals, some crops, including hay, and a large, unique container garden.

The containers are 5-gal. buckets filled with a mix of compost and soil. Legally blind since 2012, Harwood finds it easier to garden with the buckets than with conventional garden beds. However, they require a lot of compost, and the tubular composter provides it.

The Harwoods make compost from the time they first mow their lawn in the spring



**Tubular composter was made from a 20-ft. long culvert set at an angle. Compostable materials are dumped into upper end of culvert and move slowly down. About 6 weeks later, the compost is ready.**

Photo courtesy Ellen Gibson

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until December. Each day, they dump about three 5-gal. buckets of kitchen and garden scraps and animal manure into the upper end of the composter. About 5 to 6 weeks later, the compost is ready.

The initial compostable materials fill nearly two-thirds the diameter of the first foot of the culvert. This thins out to half the diameter as it moves down the length of the tube. The reduced depth makes it harder to maintain biological activity.

An engineer by training, Harwood has ideas to improve his design. He plans to add 5 internal rings with variable pitch paddles inside the cylinder to slow movement of the material downhill.

"Our goal is 3 weeks for finished compost," says Harwood. "We hope that adding the paddles will restrict the flow of the material and keep it thicker for better biological activity."

The tubular composter rests on seven 2 by 6-in. crosspieces, each with 2 castor wheels that fit into the culvert's grooves.

The 2 by 6's ride on two 16-ft. long, 6 by 6-in. hemlock timbers. They, in turn, rest on 2 shorter hemlock timbers at each end of the composter.

Vented caps with variable dampers at either end can be adjusted to control air and temperature. Four holes cut into the lower end of the culvert let Harwood turn it by hand.

"I estimate it holds about 1,200 lbs., but with the leverage of a 4-ft. pipe, it is easy to turn," says Harwood.

Even without the paddles, the composter does the job. Harwood reports only a couple of failures when the outside temperature was more than 90 degrees for several days. The internal temperature got too hot and pasteurized the material.

The Harwoods have learned not to put hay or other long-fiber material into the composter. "It comes out like a rope at the other end," says Harwood.

As the material exits the composter, Harwood collects it in a tote bag that he can move with forks on his tractor.



**Four holes cut into lower end of culvert let Harwood turn it by hand.**

"I spent my career problem solving as part of a team," says Harwood. "We would love to hear how others might make use of this idea."

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## Lawn Tractor "Rotisserie" Makes Repair Work Easier

Working on a lawn tractor is easy when you can rotate the whole thing. Roger Podoll has a rotisserie that does just that. He uses the pipe-in-pipe mounting heads found on a pair of engine stands. He notes the 6 long slots on the heads are easy to match up with existing bolt-holes on tractor frames.

"I don't have to drill any new holes," says Podoll. "Just take off the mounting heads and bolt them to the front and rear of the garden tractor, then lift up each end to slide onto the stands."

Podoll says a loader tractor, forklift or hoist could be used to raise the lawn tractor into place. He uses a post hoist and 4 serpentine belts.

"I wrap a belt around each axle and over the lift arm," says Podoll.

Once in the air, he slips the engine stand female pipes over the mounting head pipes and he is good to go.

"The stands are on wheels, so it is easy to roll it into a side bay or back in again to work on it," says Podoll. "When I want to work on the underside of the tractor, I can turn it on its side or all the way over."



**Lawn tractor rotisserie uses the pipe-in-pipe mounting heads off a pair of engine stands. "I can turn the tractor on its side or all the way over," says Podoll.**

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