



Farrell Johnson built this self-propelled machine to take on compacted soils.



He built the articulated frame from scratch, making it easy to maintain.

## Self-Propelled Aerator Speeds Pasture Growth

By Jim Ruen,  
Contributing Editor

Grass grows faster in well-aerated soils, but Farrell Johnson lives in an area in Florida where the soil packs hard - especially when it's under hoof. To maximize pasture growth, he built a self-propelled aerator.

"At the time I built it, I worked in a fac-

tory that built both aerators and field choppers," says Johnson. "I decided to build a self-propelled one using an old Deere combine."

Johnson found a Deere 55 that was in excellent shape and stripped away everything he didn't need. When he was done, he had the engine, front axle assembly, gas tank and cab. The rest was sold for scrap.

"I built a new articulated frame from 1-in. steel with replaceable pins and bushings," explains Johnson.

He mounted the combine's drive axle and cab on the front section. A swivel system at the articulation point allowed the aerator on the rear section to oscillate. The aerator drum is 30 in. in diameter with 6 by 6-in. hard alloy steel plates with gussets. They are welded every 6 in. in the shape of tire treads and staggered front to back. Filled with water, the drum provides more than enough weight to penetrate and open even the most heavily

compacted ground. A hydraulic wheel assembly was mounted behind the aerator drum for road transit and hauling. The 6-cylinder gas engine was mounted over the aerator frame, as was the hydraulic pump and reservoir.



Filled with water, the 30-in. dia. drum is heavy enough to penetrate and open heavily compacted ground.

"I built a new engine and radiator cover to protect them from the elements," says Johnson. "I used the belt drive, clutch and transmission from the combine, which allows for three forward speeds and reverse."



Combine's 6-cyl. gas engine and hydraulic pump mount behind the cab to provide down pressure on the aeration drum.

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## Diesel-Powered Minivan Gets 39 MPG

Mark Steiner has always loved diesel engines, so when the family's 1997 Plymouth Grand Voyager started leaking oil, there was only one thing to do. He pulled out the old engine and dropped in a 2.2-liter Isuzu diesel.

"I had repowered Ford Rangers with Isuzu engines before," he says, "but this was my first minivan."

Because the Isuzu engine was a bit longer than the original engine, Steiner had to make room. Working with a cardboard template, he realized he only needed about 1 1/2 in. To get it, he trimmed out the frame rails and then reinforced them on the outside.

"The trickiest part was mounting the accessories, such as air conditioning, water pump and such," he recalls. "I had to make brackets for everything and find room, which was difficult since the engine was bigger."

"I also had to make an adapter plate for the transmission," he says. "I measured all the bolt holes and spacings. If doing it again, I would go to Chrysler and get the pattern."

To give it a bit more power when he needed it, Steiner added a turbocharger and a water-alcohol injector from Summit Racing. The resulting higher operating temps then required installation of a nozzle system for cooling the bottom of the pistons.

A machinist, Steiner even made his own aluminum oil pan. The engine came with a reefer cooler that he rebuilt.

With 16,000 miles on the new engine, Steiner says he's mostly satisfied. "It's so efficient, you can idle it on a hot day without the radiator, and it doesn't get hot," he says. "We get 28 to 35 mpg around town and 39 on the highway."

There are things he would change if he did it again, such as the wiring. He would install a completely new wiring harness. He admits



Mark Steiner pulled the gas engine out of his 1997 Plymouth car and dropped in a 2.2-liter Isuzu diesel. He had to cut the frame rails to make the engine fit.



still not having the cruise control working. The car's computer also doesn't respond correctly to air conditioning.

He may start doing conversions for others, he says. He estimates using about \$4,000 in parts including the engine, servo, alternator

and vacuum pack. He thinks that with labor, he could probably do a similar conversion for around \$6,000.

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