

## All-Wood Gas Engine Really Runs

You've never seen anything like this all-wood 1-cyl. gas engine built by Paul Gorrell, Burlington, Iowa.

There's no metal at all in it - no screws, nuts, nails, or anything else. It's held together with wood pegs and even has a wood gas tank, fuel line and mixer, all of which are coated with gas tank sealer. All the moving parts were penetrated with Minwax wood hardener and sprayed with coats of Teflon Dry Lube high performance formula. They're also lubricated with extra virgin olive oil. The engine even has a striking flint stone ignition.

Eight different kinds of wood were used to build it. The oak pins that hold the engine together can be driven out to take the engine apart for repairs.

"I've been showing equipment at engine shows for 40 years, and this is the best 'draw' I've ever had. People are fascinated by it," says Gorrell.

The engine measures 4 ft. long, 3ft. high and 2 ft. wide and rides on a 4-wheeled cart equipped with a tongue made from a Louisville Slugger bat. Pecan was used for the flywheels, gears, push rod and rocker arms; oak for the frame, wheels, axles, and bolsters; hickory for the inner frames, cylinder, rod and tongue; honey locust for rails; walnut for the platform, nuts, and other miscellaneous parts; cedar for the hopper; mahogany for the pulley; and ebony for the piston and cylinder.

Wood doesn't transfer heat, so Gorrell de-

signed the engine to cool internally. The 3 3/4-in. bore piston has a 7-in. stroke. The engine cools itself by drawing air in and out of the exhaust port three times between firings. "There are three in-and-out strokes between firings, which is what cools the cylinder walls," says Gorrell. "Halfway down, the intake stroke becomes a power stroke so I'm getting two cycles out of one stroke, which accounts for the odd one. I eliminated the compression stroke to get rid of heat.

"When I fired my all-wood engine up the first time I wondered if it would just burn up, but it really sounds like other old antique gas engines. It usually starts easy with a slow quarter turn pull on the flywheel. I enjoy seeing peoples' faces when they hear the engine come to life. The only problem I had was with two burned valves. I knocked the pins out that hold the engine together, fixed the valves, and put everything back in place."

To make the cart's tongue, he drilled a hole through the end of the bat and put a wood pin through it that extends into the front axle so that he can use a Louisville Slugger baseball bat to pull and steer the cart.

Before building the engine, Gorrell even ran each board through a metal detector to make sure there weren't any screws in it. "I found three pieces that I couldn't see on the outside," he notes.

Contact: FARM SHOW Followup, Paul Gorrell, 11306 Mill Dam Road, Burlington, Iowa 52601 (ph 319 753-1837).



There are no metal parts in Gorrell's engine, which was made from 8 kinds of wood.



Side view of the timing gear and push rod.



Fuel mix adjuster, valves, and gas tank.

## Missouri Shrimp Farmer Sells His Harvest At Annual Festival

By Dee George

Last year Paul Smith turned 5 lbs. of baby shrimp into 465 lbs. of freshwater prawns. At harvest, he had a party and made a little money. This year he plans to raise more shrimp and also sell stock to other farmers to start their own ponds. The Missouri farmer calls his growing aquaculture business the Show-Me Shrimp Farm.

"I'm the Johnny Appleseed of shrimp farming in central Missouri," Smith says. Five years ago, a television news segment about an Illinois shrimp farmer intrigued the tool-and-dye worker enough to take a 5 1/2-hour trip to go see the operation himself. He'd always had an interest in aquaculture, but raising bluegills and trout didn't grab his attention like shrimp did. The shrimp are a fresh water variety, native to Malaysia.

Despite naysayers in Missouri's Department of Agriculture, Smith researched and found valuable information at Kentucky State University. With the encouragement of a \$3,000 sustainable ag grant and a personal investment of 401K money, he drilled a well, had a pond dug and added a lean-to greenhouse to the side of a barn that once housed his parents' dairy cows. The first year he drove 8 1/2 hours to Texas to buy 10,000 21-day-old shrimp, about 1/4 in. long. He successfully raised them to 3/4 in. and put them in his pond. They grew and all was going well, but Smith didn't fully realize the impact of cold weather.

He didn't harvest the shrimp soon enough and he lost them all, but he learned valuable lessons that have improved his operation each year. The process goes something like this.

- April - Purchase 21-day-old postlarvae for 2 1/2 cents each. An 8-ounce chip dip container holds 5,000.
- Put them in two tanks in the greenhouse. (The tanks are actually cement burial vaults Smith got for free.) Keep the water temperature at 82 degrees and feed the shrimp specially formulated food until they are 60 days old and about 3/4 in. long.
- Move the shrimp to a 100 by 250-ft. pond that has been filled with fresh water a couple

of weeks before. Feed them stinking catfish food. Plus, they eat algae and organisms growing in the pond.

• The second Saturday in September Smith gets up very early and opens the 8-in. plug at the 5-ft. deep end of the sloping pond. It takes the water 7 1/2 hours to drain and the shrimp "walk" out following the water into a catch basin.

It's harvest time and party time all rolled into one.

Last year 400 people attended Smith's 3rd annual Shrimp Festival. Helpers netted the prawn shrimp out of the catch basin into ice cold water, where they die in 15 minutes. People lined up and bought 400 pounds of shrimp for \$10/lb. (about 15 prawns/lb.). Smith said they could be bigger, but he doesn't want to risk an early cold snap. He figures his season is about 120 days.

Since Smith isn't licensed to process food, consumers clean the prawns themselves, after he demonstrates how to pop off the heads and prepare them for cooking. For the festival, Smith contracted with a Cajun cook to boil the shrimp and offer a lunch of corn and potatoes for \$2 apiece.

"The shrimp are delicious. They taste more like lobster," Smith says of his organically raised prawns. "I want this to be an event people look forward to coming," he adds. For next year's festival, he's lined up a musician from Texas and an accordion player from Oregon, several food vendors, wine tasting, horseshoes, volleyball and lots of kids' games. Smith doesn't charge an entry fee, and he offers free camping on his 50-acre farm.

Holding a festival is a lot of fun and takes care of marketing, Smith says.

For 2007, he's going to raise more than 15,000 shrimp. Plus, he's building a pool inside the gambrel-roof barn for a nursery to raise shrimp from 21 to 60 days and sell them for 7 cents apiece to pond owners who want to get into the business.

Shrimp farming is taking off. There are at least 13 operations in Missouri.

People considering it should understand



Paul Smith grows shrimp in a 100 by 250-ft. pond. Last year the Missouri farmer turned 5 lbs. of baby shrimp into 465 lbs. of full-grown prawns. This year he plans to raise more shrimp and also sell stock to other farmers to start their own ponds. The Missouri farmer calls his growing aquaculture business the Show-Me Shrimp Farm.



that the setup is expensive; Smith spent about \$20,000. There are also risks - cold weather, as well as some losses to predators such as blue herons. Smith's setup includes aeration and automatic timers for feeding.

As he plans for his fourth harvest, Smith remains enthusiastic about raising shrimp and his role as an aquatic Johnny Appleseed.

Contact: FARM SHOW Followup, Paul Smith, Show-Me Shrimp Farm, 695 Bennet St., Lebanon, Missouri 65536 (ph 417-664-2307, smitty4u66@hotmail.com, www.showmeshrimp farms.com).

