

Dairyman Builds World's First Manure-Powered Feed Truck

After 6 years of planning and 2 years of building, the Straus Dairy Farm electric feed truck is now humming along. Albert Straus, along with a local mechanic and an electric vehicle expert, built the rig by converting a 1990's single-axle International Harvester straight truck from diesel to electric power. The truck now carries a mounted Kuhn/Knight TMR Mixer that Straus thinks is a "first of its kind" farm workhorse.

Ultra-quiet and efficient, the truck's electric motor produces 170 hp., and 950 ft.-lbs. of torque, enough to haul, mix, weigh and unload 9 tons of feed. The 2 vertical mixing augers and the unloader are driven by a pto from the truck's transmission. Straus says "It doesn't have the speed of a diesel, but it has more torque and easily handles a full load."

Early in the building process the team installed 2 DC motors, but those didn't allow automatic brakes, so the truck went too fast and the motors overheated. "During one test run the truck sped down a hill so fast the motor burned out and we had to tow the truck back to the barn," says Straus.

As electric vehicle technology evolved, Straus and his team eventually installed a UQM motor (uqm.com), added an inverter, an electric air compressor, an electric power steering pump, a battery system with an on-board charger, and computers to control speed in different driving conditions. Now the truck can travel slow enough to unload feed yet fast enough—at 40 mph—to move quickly around the farm. Lithium-ion batteries that run the motor store 48 KWH of power.

The batteries are re-charged overnight by electricity produced by the dairy's manure



Powered by two big DC motors, the Straus feed truck can haul, mix, weigh, and unload up to 9 tons of feed. It's powered with electricity generated by the farm's manure digester.

digester, which Straus built in 2004. That system also provides electricity for smaller farm vehicles and machinery, including Straus's all-electric Toyota RAV4 and a Nissan Leaf. Straus says the electric truck has allowed the organic dairy to go full-circle with energy production. "The truck delivers feed to the cattle, whose manure enters a digester, which creates gas to power a generator. That electricity recharges the batteries and heat created in the process

provides warm water for the dairy. Separated solids and leftover liquids from the process are used as organic fertilizer on pastures." Straus says the average annual cost savings for the digester is \$40,000 to \$50,000. They had a 5-year payback on the system originally.

Straus has been an innovative thinker since he began farming with his father in 1977. In the early 90's, they became all organic and created the Straus Family Creamery,

producing non-homogenized milk sold in re-usable bottles.

Up next, Straus plans to unveil an all-electric refrigerated delivery truck that will transport Straus Family Creamery products to San Francisco markets. He also wants to convert a diesel payload to electric power.

Contact: FARM SHOW Followup, Straus Family Creamery, 1105 Industrial Ave, Suite 200, Petaluma, Calif. 94952 (ph 707 776-2887; www.strausfamilycreamery.com).

Stainless Steel Rain Tanks Built To Last

Nell Wheeler is a plumber who installed a rain collection tank for herself 15 years ago. Then she started installing them for friends. That led to a business with her husband, Dean, making stainless steel rain tanks that are built to last.

"We've been building them since 2013," says Nell. "A lot of our customers wanted metal tanks. We tried galvanized steel, but they rust out, plus you have to put a coating of epoxy on the inside, and it's unpleasant to work with and hazardous to apply."

While one option was poly tanks, Dean says they can be short-lived. "Stainless steel manufacturers project at least a 150-year life expectancy."

Nell adds that while polyethylene tanks seldom get recycled, the steel they use is certified as having 92 percent recycled content.

Nell says the tanks are most often used for irrigation, noting that gardening was why she installed her first tank. She explains that the tanks are assembled in their facility with all needed fixtures in place. If a pump is going to be needed, the tank is designed with that in mind.

"When people contact us, we ask what the end use of the water will be, size of tank, type of overflow desired, and any special fittings needed," says Nell. "We can help size the tank by application and design the overflow so it won't be an eyesore."

The Wheelers recommend installing a diversion in the water system to take debris out of the water before it reaches the tank. "We have put diversion systems inside the tank, but it is more expensive and less effective," says Dean.

With a diversion in place, cleaning out a tank that has been properly installed is seldom needed. Nell has seen 15-year-old tanks that have only a tiny amount of sediment.



Stainless steel rain tanks are available in a variety of sizes. Photo shows pipes entering and exiting tank and also a diverter pipe.

Water tanks need a solid base. "If you're not pouring concrete, we suggest crushed granite or any hard rock. Don't use pea gravel because it doesn't lock together for a firm base."

The Wheelers started out selling rain tanks in the Houston area, but have since sold them throughout the U.S. and as far away as Puerto Rico. Standard tanks vary from a 3-ft. dia., 150-gal. tank for \$665 to a 7-ft. dia., 2,400-gal. tank priced at \$3,535.

Options include prefiltration, mosquito screening, pumps, valves, rock rings and level indicator. Custom sizes are available.

Tanks over 500 gal. in size are shipped upright. Tanks taller than 7 ft. must be shipped on an open trailer.

All tanks are manufactured to order and built by hand. They can take up to 4 weeks to be delivered, depending on the time of the year.

Contact: FARM SHOW Followup, Metal Rain Tanks, P.O. Box 21534, Houston, Texas 77226 (ph 832 630-9556; Info@MetalRainTanks.com; www.metalraintanks.com).



Phil Brown's self-propelled vacuum apple picker now comes with picker-carried baskets so pickers don't have to place apples in a trough at the end of the tubes.

Vacuum Picker Sucks Apples Out Of Basket

Phil Brown's self-propelled vacuum apple picker has new picker-carried baskets. Apples placed in the baskets are sucked out through foam-lined vacuum tubes to packing crates. When the machine first debuted (Vol. 34, No. 4), pickers would place apples in a trough at the end of the tubes.

"It's much more natural to pick apples into a basket without having to find a trough at the end of the tube," explains Brown, Phil Brown Welding. "This way you don't even have to look."

The basket is attached to a harness worn by the picker. The basket pivots on the tube so it's easy to move around.

The machine has sheltered platforms on either side. Foot controls allow the pickers to move the platform forward or back and up or down to reach apples from 8 to 14 ft. Pickers can also walk alongside the workstation to reach lower apples.

Pickers set their apples into the baskets where they are whisked away to be distributed gently into a 20-bushel bin. The apples move at 12 ft. per second, landing in a foam-lined pocket and gently rolling out onto other apples. When the bin is full, it is moved aside and replaced, giving pickers a 45 to 60-sec. break approximately every 10 min.

Michigan State University studies showed workers on an earlier version of the machine filled 25 to 50 percent more bins per day



Apples placed in baskets are sucked out through foam-lined vacuum tubes and into packing crates.

than traditional pickers on ladders with bags. Bruising was reduced by 10 percent.

Brown says the new baskets are increasing efficiency even more. "They are working very well, just about zero bruising," says Brown.

Tests have shown that 4 pickers using baskets can pick from 14 to 20 bushels per man-hour.

Brown also increased the size of the motor on the machine to 60 hp, giving it sufficient power for hills and even snow-covered orchards. He says the machine can be used for a variety of firm round fruit and vegetables. The platform can also be used for other orchard work such as trellising, pruning and hand thinning.

It's priced at \$138,000 for the entire package.

Contact: FARM SHOW Followup, Phil Brown Welding, 4750 8 Mile Rd. NW, Conklin, Mich. 49403 (ph 616 784-3046; Phil@philbrownwelding.com; www.philbrownwelding.com).