

Add-On Hydrogen Generator Saves Fuel, Cuts Emissions

HydroGen, an onboard hydrogen or Brown's Gas generator, saves fuel and reduces emissions dramatically. Developed by Water Fuel Engineering, each HydroGen is custom-designed for the vehicle. Over the past 7-plus years, the devices have been installed on all types of engines, from ATVs to farm tractors and large commercial and municipal trucks. The company has won numerous awards in the U.K. for technical innovation.

"Depending on the engine size, the conditions it operates in, and how it's used, HydroGen reduces fuel use from 10 to 37 percent and reduces emissions by up to 80 percent," says Alexander Nenov, Water Fuel Engineering. "HydroGen requires no engine modifications and works with any carbon-based fuel type, diesel, petrol or natural gas."

Nenov explains that fuel savings take about 2 weeks to develop, as carbon is removed from the cylinders during the first week. Running cleaner is one of the benefits HydroGen provides. Before and after installation testing has shown near zero emissions.

"Users report improved engine response," says Nenov. "We've installed the units in a wide range of engines including JCB, John Deere, and New Holland."



"HydroGen reduces fuel use from 10 to 37 percent and reduces emissions by up to 80 percent," says Nenov.

HydroGen requires only a connection to the alternator to secure the engine signal and output to the air intake where the hydrogen mixes with oxygen in the air. It can be installed on the engine or elsewhere on the vehicle.

"It can be installed under the hood, in a car trunk, or even under or behind a seat," says Nenov.

The brain of the system is the electronic control unit (ECU). Nenov suggests the ECU gives the HydroGen its efficiency and its fail-safe feature.

"If the device stops working, the vehicle can continue operating as it would without it," says Nenov. "A lot of Brown's Gas devices on the market don't have that feature."

Development of HydroGen began about 11 years ago. It's been available in the U.K. since 2016. Since then, it's been marketed throughout Europe and through a distributor in Southeast Asia. The company set up an office in the U.S. just before the COVID-19 outbreak but closed it due to the pandemic. Nenov reports they're again looking for a U.S. distributor.

"HydroGen is the best solution to reduce fuel use and emissions in existing engines," says Nenov. "Contact us for an estimate. All we need to know is the size of the engine, the voltage from the car battery, and how the engine is used."

Contact: FARM SHOW Followup, Water Fuel Engineering, Unit 3, Church St., Wakefield, West Yorkshire WF1 5QY



HydroGen requires only a connection to the alternator to secure the engine signal and output to the air intake where the hydrogen mixes with oxygen in the air. It can be installed on the engine or elsewhere on the vehicle.

United Kingdom (ph 441226213314 or 447778590903; www.waterfuelengineering.com).

Fluorescing Crops Cuts Pesticide Use

Genes inserted into corn, soybeans, and cotton will soon tell farmers when and where to apply pesticides or nitrogen. InnerPlant places genes that produce a fluorescing protein next to immune function genes. Those genes go into overdrive, producing an immune response when the plant is invaded by pests or other stresses. When the immune function kicks in, so does the fluorescing gene.

"We already have two soybean varieties with the ability to react to fungal attacks," says Sean Yokomizo, InnerPlant. "Next will come traits for insect and nitrogen stress."

Research is ongoing on corn and cotton. Corn varieties aren't expected to reach fields for several years. Cotton will follow.

The 2024 crop year will see InnerPlant-engineered soybeans in four plots in four different locations. At the same time, InnerPlant is working with seed companies to bulk up the production of seeds with the traits. Over the next 3 years, the company plans to expand throughout the major soybean-producing states.

Initially, the stress-reacting plants will be sprinkled throughout fields to act as sentinels. Eventually, the genes will be in all the seeds planted in the field, much as other engineered



Early research by the company detected water stress in tomatoes. Once water was applied, the fluorescing gene shut down.

traits are today. When the plants react and sensors pick up the fluorescent coloring, farmers will know they have a problem and where in the field it is.

"The plants will signal they're infected with a fungus within 48 to 72 hrs., well before it can be seen in the field without the trait," says Yokomizo.

InnerPlant recently announced a partnership with John Deere and Syngenta. It's been

working with John Deere to fine-tune its on-board cameras to detect the fluorescence.

Under the partnership to create a Precision Integrated Platform, InnerPlant will use satellites to detect a fungal attack over several acres or more. Syngenta will recommend the appropriate product and timing. In the field, John Deere applicators will use onboard sensing to determine where to apply product.

Analysis by John Deere and InnerPlant researchers suggests that early stress sensing could save farmers money by reducing pesticide applications by up to 75 percent.

Yokomizo notes that sensing nitrogen stress is in its early stages. However, researchers expect the crop genes will react to it within the same 48 to 72 hrs. as with fungi.

Tomatoes were InnerPlant's model crop for developing an immune response to water stress. Tomatoes were chosen in part for the ability to do multiple generations in a single year. That work verified tried and true placement of the genetic material," explains Yokomizo.

Early research by the company detected water stress in tomatoes at that same time period. Once water had been applied, the fluorescing gene shut down.

Yokomizo explains that water stress isn't as significant a factor in the targeted commodity crops. This is why the company is working on

detecting immune responses to fungi, insects, and nitrogen.

"The fungal and insect reaction signals are broad," says Yokomizo. "The value is in the early warning of a fungal issue, and we don't want anything to slip by."

As the fungal trait comes to market, InnerPlant intends to price the trait similarly to how Monsanto first priced the Roundup Ready trait, which was around \$8 per acre.

"It's been interesting that as the Roundup Ready trait increased in price, its effectiveness decreased, with weed resistance increasing," says Yokomizo. "We expect our traits to get more effective over time, at no increased trait license fee, as we gather more data and modify them for things like weather."

Yokomizo expects adaptation to be fast, as the company has already received approval from the USDA and is currently going through the FDA process. He notes that the European Union has a fairly standard path for clearance.

"We don't expect it'll be long before our traits are in farmer-preferred germplasm (seed)," says Yokomizo. "Then farmers will be able to spray only when it's needed."

Contact: FARM SHOW Followup, InnerPlant, 202 Cousteau Place, Suite 150, Davis, Calif. 95618 (hello@innerplant.com; www.innerplant.com).

Compact Lifts For Tight Spaces

"We're out there to replace ladders," says Kyle Schoenherr of Cruiser Products. While the initial focus market was poultry operations, the compact platforms have become popular with greenhouse owners, electricians, and other tradespeople.

The Ohio company designed and manufactured its first mini lifts 12 years ago to help poultry farmers access higher cages in barns without having to go up and down ladders.

At 20 in. wide, the first compact unit was narrow enough to go down walkways, and its fixed height platforms (22 and 32 in.) off the ground gave workers access to the highest cages. Long-life rechargeable batteries power the units to move at a good walking pace with simple handlebar steering. At \$4,000, the compact style works well for operators working on solid surfaces such as concrete and mezzanine.

As the poultry industry changed to more cage-free operations and surfaces with litter, Cruiser Products added a heavy-duty lift (\$4,800) with more power, bigger tires, wider wheelbase options (23 and 26 in.), and custom heights.

"The thing that got us into new markets is the scissor series. The mini scissor lift is lightweight, compact, and able to go through doorways, so its uses go beyond poultry," Schoenherr says.

With its lift range from 32 to 72 in., it's especially handy for greenhouse workers and electricians. The powder-coated steel frames are assembled in Ohio, and each unit is shop-tested before being sold.

"It's a perfect replacement for an 8-ft. ladder. We get lots of interest from people who manufacture everything from sheds to RVs, and we get some interest in areas of ag for wash down practices such as tractor

trailers," he adds.

Besides the handy lift feature and stable 26-in. wheelbase, the platform cage adds safety and supports up to 300 lbs. It sells for \$8,200.

"From a safety perspective, they're getting very popular to prevent ladder injuries. We're hearing from contractors that sometimes ladders are not even allowed, and they need to find other solutions," Schoenherr says. "Cruiser Products lifts are mobile and are affordable so they're more accessible to customers (than larger, expensive scissor lifts)."

There are some dealers in the U.S. and Canada, but Cruiser Products also sells direct. Check out its website for more information.

Contact: FARM SHOW Followup, Cruiser Products, 411 Stachler Dr., St. Henry, Ohio 45883 (ph 419-678-8615; info@cruiserproducts.com; www.cruiserproducts.com).



"The thing that got us into new markets is the scissor series. The mini scissor lift is lightweight, compact, and able to go through doorways, so its uses go beyond poultry," Schoenherr says.