

One-of-a-kind tractor powered by a WWII Indian motorcycle motor.



Diamond T is equipped with an OEM-installed 450 CI IH Red Diamond engine and a V8 Buick engine.

Rare Finds Highlight Unique Collection

The nearly 200 tractors, 40 cars and close to 140 trucks make the 125,000-sq. ft. Keystone Truck and Tractor Museum a place worth visiting. Don't miss the one-of-a-kind tractor powered by a WWII Indian motorcycle motor. It's made almost entirely with WWII government surplus parts.

If you prefer trucks, check out the cab-over-engine Diamond T. It features an OEM-installed 450 CI IH Red Diamond engine and a V8 Buick engine that sticks out like a turtle's head.

"We have some very rare and one-off or

"only a few made" cars, trucks and tractors," says Dylan Simmons, Keystone Truck and Tractor Museum. "The founder is Keith Jones. He grew up on a farm and now operates a nationwide trucking company. He started collecting tractors and trucks before opening the museum."

The one-of-a-kind tractor is a good example of the unique exhibits to be seen at the museum. It was designed and built by Leonard Kanner in 1951/52. He was an engineer living in Macedonia, Ohio.

The motor is a 1942/43, 72-cu. in., flathead

twin V model 342 from a military Indian motorcycle. It has a 3-speed transmission. Belt drives run from the motor to the rear wheels. Kanner used heavy-duty hydraulic parts for many tractor functions, including powering both the top and lower links of the 3-pt. hitch.

Even the wheels look homemade, with large square steel plates mounted inside the rims and bolted to the front and rear axles. Hydraulic motors are used throughout, including for the cooling fan.

In the display, the tractor has an attachment on the 3-pt. Kanner's family recalled him using the tractor for dirt work on a house he was building. He also used it for gardening and yard work with a sickle bar mower. He designed and built the mower so it could be raised to trim his hedges.

The tractor was built for multiple purposes. The truck was modified for one thing only: power. Frank Gripp, Gripp Trucking, Annawan, Ill., added the second engine after his newly hired son complained the truck couldn't keep up with traffic.

According to an article on Hemmings.com news, Gripp first installed a Wisconsin air-cooled V4 ahead of the stock RD450. He linked the crankshafts with air controls, but the Wisconsin couldn't match the larger engine's rotational speed. He then tried a Jeep 4-cyl. It matched the rpm but didn't add much power. The 300-cu. in. Buick V8 replaced it.

Gripp ran the Buick's output shaft through a hole in the radiator and bolted it to the IH's engine crank pulley. The torque converter in

the Buick handled the difference in engine speeds. Air controls shift the automatic transmission between neutral and third gear. The Diamond T's throttle pedal worked both engines. Gripp added a hood and grille to the add-on engine.

Gripp and his son were satisfied. He reported passing every car on I-80 on its first trip out. The modification was made in the mid-1960s. The truck remained in operation through 1975, when it was pulled off the road due to rust. The tag axle was repurposed for a trailer, and the truck sat until the late 1980s, when it was sold to a collector. A few years later, it was sold to Adams Transit, which restored it to preserve the unique drivetrain. They replaced the cab-over-engine cab and added a Diamond T grille for effect. In 2023, it was acquired by the Keystone Museum.

Keystone offers more than just trucks, cars and tractors. Other displays include old tools for carpenters, loggers, coopers, barn builders and blacksmiths. One cabinet holds the tools and spare parts Kanner used to build his tractor.

There are displays of garage tools, oil cans and oil company signs. A replica of a two-bay service station has a 1955 Thunderbird on the hoist and another on the floor.

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Researchers Battle Parasitic Weeds

A team of researchers at the University of California, Riverside, has identified a promising weapon in the global fight against parasitic weeds. Orobanchaceae weeds invade crops and strip essential nutrients from the root system. With nearly 200 species in the family and the ability to produce as many as 50,000 tiny seeds per plant, they're serious threats, devastating the crops they infest.

"These parasites are most problematic in sub-Saharan Africa, the Mediterranean region and Asia," says David Nelson, Plant Biologist at the University of California, Riverside (UC Riverside). "U.S. agriculture is much less impacted by these weeds, in part because we're so aggressive about quarantine and control when they pop up."

That said, the Orobanchaceae, commonly known as witchweeds, have been found in California, and those often called broomrapes have been found in North and South Carolina. The California variety poses a threat to the \$1.5 billion processing tomato industry. If growers discover it in their fields and report it to the state, they're required to destroy the field before harvest.

Broomrapes made a serious invasion in the Carolinas during the 1950s. By 1956, they had infested nearly half a million acres. Eradication efforts have been largely successful, and by 2015, the infestation was reduced to around 1,300 acres. Control efforts are ongoing.

Nelson and the UC Riverside research team are working with a class of hormones called strigolactones. Potential host plants naturally produce these hormones to regulate growth and encourage the growth of beneficial fungi. However, the parasitic seeds can lie dormant in the soil for up to 10 years until their host plant releases the hormones.

"The idea is to trick parasitic weed seeds into germinating in the absence of a host by treating the soil with strigolactones or a similar compound that can stimulate germination," explains Nelson. "Without successfully attaching to a host, the parasite seedling runs out of energy and dies in a few days."

Nelson describes it as weed suicide. The problem with this approach is that



Broomrape parasitizes clover.

strigolactones are complicated molecules that are difficult and expensive to synthesize. They're also generally unstable in water.

The research team, led by Professor Yanran Li, now at UC San Diego, developed a process to produce the hormones using bacteria and yeast. This allows them to study the hormones and potentially produce large amounts of them. They also identified the genes that make them.

The research opens the door to a deeper understanding of the hormones and how they can be adapted and used. It also applies to a better understanding of other plant enzymes.

In addition to soil application, possible uses include rotation cropping with a non-host crop that produces strigolactones, which will stimulate parasitic weed seed germination.

The researchers are evaluating the weed suicide strategy to see if it'll work in real-world fields.

"We're testing whether we can fine-tune the chemical signal to be even more effective," Nelson said. "If we can, this could be a game-changer for farmers battling these weeds."

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Soil-Based Battery Powers In-Field Sensors

Scientists at the University of Bath have discovered that billions of microorganisms in soil, including bacteria and fungi, not only break down nitrogen molecules for plant use but also produce electricity. They aim to develop soil-powered batteries using this electricity.

The baseball-sized "Bactery" is being developed to power in-field sensors that are increasingly being used in agriculture.

"They're permanently installed in the soil and act as a power source for nearby sensing devices," says Bactery CEO and founder Jakub Dziegielowski. "They self-recharge from the ground, and because of this, can offer a continuous source of power. Simply install them in the ground and forget about any maintenance."

The device has two electrodes with a grounded anode and a cathode exposed to the air. It depends on electrigenes, which are soil microbes that generate electrons when consuming organic compounds. Electrons move from the microbes to the anode and then to the cathode via an external circuit.

"In-field sensors need a reliable and cheap



"They self-recharge from the ground, and because of this, can offer a continuous source of power," says Bactery CEO and founder Jakub Dziegielowski.

source of power," Dziegielowski says. "At the moment, the power delivery solutions make up 50 to 60% of the costs of sensors and IoT (Internet of Things), with the most common types of wireless power being solar and single-use batteries."

The UK-based company expects to sell the soil-powered batteries for about \$45. They believe this innovation will initiate a strong North American market.

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