

NAIO Technologies robot tills between rows.



Electric Robots Ideal For Vegetable Farmers

Three robots called Dino, Oz and Ted are working vegetable fields and vineyards in France and other countries.

"We gave our products real names because they're doing the work that humans do," says NAIIO Technologies founders Gaetan Severac and Aymeric Barthes. In the past decade the dynamic engineering duo has assembled a sophisticated team of developers that have produced 3 unique products.

DINO is a 1,750-lb. robot with 4 driving wheels that can work beds from 47 to 63 in. wide traveling about 2 1/2 mph. GPS guidance is paired with camera vision so DINO works precisely and accurately. Its mechanical tool set includes hoe shares, spiked harrows or rotary hoes. Power is supplied by lithium batteries.

TED is a precise weeding tool for vineyards, a vehicle that Barthes says replaces a large amount of human labor and reduces chemical use. Built on a frame that's 90 in. long and 80 in. wide, TED can work up to 8 hrs. on its lithium batteries. Four drive wheels transport

the vehicle as it uses Kress fingerweeders and passive interplant hoeing blades. The company is working on prototype tools for mowing, debudding, leaf thinning and trimming.

OZ is the newest and smallest vehicle in the NAIIO line, barely knee high, but capable of working between rows of growing vegetables. "In 4 hrs. OZ handles the same amount of work as one person could do in 2 days," says Franck Echard, a French market gardener. Because of its small size and electric power, OZ can also work inside greenhouses or hoop buildings. The vehicle uses a ridging brush, straight tines or low spiked harrows to till between rows and can also be set up to tow a seat or pull a small trailer. Guidance for OZ is supplied by a camera and laser with electrical power from 40 to 100 A lithium batteries.

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Ford 8N Repowered With A 460 Big Block Engine

Eric Del Ponte has bought, repaired and resold more than 100 tractors, but nothing compares to his recent repower of an 8N with a Ford 460 engine.

"A lot of people do 8N conversions with small block engines, but I thought I would give a big block conversion a whirl," says Del Ponte.

A service manager at a local Kubota dealer, Del Ponte has built a profitable sideline business putting older tractors back to work. He advertises on Craigslist for old tractors that don't run.

"I used to work on cars, but they require registration and licensing fees," says Del Ponte. "Tractors don't, plus I learned there is a little money to be made if you do them right, just fixing what is needed."

The project required extensive measuring and mocking up components. Del Ponte stripped out the old engine, cooling system, gas tank and steering, extended the chassis and hood by 18 in., and built mounts for the 460.

"A machinist friend did the work on a 5/8-in. steel plate to match up the truck engine bell housing and clutch with the tractor transmission," says Del Ponte. "I wanted to keep everything I could original from the 4-speed back."

The larger engine, with its air cleaner and carburetor, required removing the gas tank. Del Ponte substituted an old 5-gal. metal gas can and mounted it behind the seat.

"I added an electric fuel pump and ran a fuel line from the gas can," says Del Ponte, who even attached it with rusty barbwire.

He wanted the tractor to be a loud attention-

getter at shows so he found a universal 460 exhaust kit in a hot rod catalog.

"I had to cut and weld the pipes to clear the steering," he says. "I made a jig to hold them before tack welding them and then the final weld."

A new cooling system was another big challenge. Del Ponte measured the available space and sent the numbers off, with a description of the engine and its new use, to a custom radiator shop in Oregon. Crossing his fingers, he waited and hoped he had measured right.

"It was the most expensive part of the entire conversion," says Del Ponte. "When it arrived, it just barely fit."

Del Ponte replaced the OEM dials with electric sensors and dials for engine temperature, oil pressure, voltage and rpm's. "They are vintage looking, but are still the shiniest things on the tractor," says Del Ponte.

Keeping the look of the tractor as he found it was important to Del Ponte. When he inserted an 18-in. section of hood from another 8N, he carefully finished it and the weld with the same patina as the rest of the hood.

Likewise, when he added hot rod style headlamps to the front end, they looked like they too sat in an old dairy barn for years. Both fit well with the original steering wheel and seat.

One very visible change to the tractor was the addition of extra-large rear tires. Del Ponte picked up a pair of combine tires and wheels. He cut out the wheel centers and replaced them with centers from the 8N wheels.



The robot follows a trail of magnets drilled into the concrete floor. The operator can use the touch screen on the robot to control it or use an app-equipped device to program it to operate at different times during the day.

Robot Feed Pusher Follows Track

The robotic feed pusher from Valmetal reduces waste and increases milk production. The Pro-Feed automatic feed pusher lifts feed that has been pushed aside and places it back in front of the cow.

"The Pro-Feed 2020 lifts feed up with its plastic auger, freshening the feed," says Greg Luth, Valmetal. "A plastic scraper underneath the machine pushes feed into the auger, remixing any components that have separated."

The robot follows a trail of magnets drilled into the concrete floor every 5-ft. for straight lines and closer for curves. The operator can use the touch screen on the robot to control it or use an app-equipped device or computer. The robot can be programmed to operate at different time intervals throughout the day or evening. It can also be programmed to lift its scraper when passing over a walkway in between feeding aisles.

When the two 12V, 105 Ah batteries are depleted, they follow magnets to a dock at a 110 outlet for automatic recharging. If

a problem occurs, the robot will text the operator.

The 1,540-lb. robot is 79 in. long, 43 1/2 in. wide and 33 1/2 in. high. "The smooth surface ensures an animal can't touch it or grab it," says Luth.

The robot has been in use in Germany for about 4 years before being introduced in Canada and finally the U.S.

Luth notes that while the Pro-Feed 2020 was designed for use with dairy, it is rapidly finding a home in the beef industry. The basic unit sells for \$30,971.

Other robotic systems from Valmetal include bedding delivery and feed and hay distribution using overhead rails.

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Del Ponte stripped the engine, cooling system, gas tank and steering from his 8N, then extended the chassis and hood to fit the 460 engine. Hot rod headlamps and combine tires add to the look of his custom 8N.

A final modification was to add a people carrier to the 3-pt. Del Ponte wanted to have a safe way to bring his sons with him on the tractor. The padded seats are even equipped with cup holders. A cooler mounted ahead of it keeps refreshments handy.

See more of his work on his Facebook and Instagram pages, Old Iron Garage.

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