

# Tractor "Swarms" Ready To Take Over Farm Fields

Zack James is ready to send a swarm of small, driverless tractors into the fields. His Rabbit Tractor can carry a 500-lb. payload on its battery-powered, computer-controlled platform while floating across the ground at less than 5 psi.

"That's less down pressure than a man walking," notes James. "This year we could have been planting all through May. All those fields that couldn't be planted with large conventional equipment this spring could have been planted with a swarm of Rabbit Tractors."

At a price point of \$15,000 to \$20,000, James suggests that a farmer and his soil would be much better off with 20 of them than one \$400,000 tractor. If one Rabbit Tractor breaks down, 19 continue working. If that one big tractor has a problem, fieldwork stops.

"If you look at the comparison on a production basis, such as acres per hour in the field, we will be comparable to existing equipment," says James. "However, agronomic and logistical benefits are where the added value comes in."

The Rabbit Tractors are 4-WD with 4-wheel independent steering and a top speed

of 7 mph. They use a combination of sensors, computer vision and radar to recognize obstacles and use a living field map to learn the field.

"We create a field map and use it to introduce the machine to the field as it travels slowly across the field, learning elevations, obstacles, wet spots and more," says James. "Every time it crosses the field, it gets smarter and can travel faster."

The ability of the machine to learn and respond means that if a person steps in its path, the machine recognizes it is a human and either stops or goes around. Because it was a person, it doesn't add it to the field map as a permanent object.

While the prototype is a rectangular platform, the next prototype will be a split unit with front and back modules and a workstation in the center. James is developing implements to ride on the workstation.

"This fall we will have a soil sampling machine and a corn replanter/cover crop seeder," says James. "We'll be doing field testing and plot work this fall. By next spring we plan to have 20 units in the field."

He indicates several large companies are interested in the concept and will be field



Driverless rabbit tractor can carry a 500-lb. payload while floating across the ground at less than 5 psi. James is developing implements to ride on the work station.

testing Rabbit Tractors this fall. If satisfied, field tests will continue next year. A number of farmers will also be leasing Rabbit Tractors for in-field work.

"We are working with an Indiana farmer to seed cover crops in 40-in. row corn in August," says James. "The Rabbit Tractor will be able to travel under the canopy to seed the cover crops."

James sees Rabbit Tractors as ideal for

beginning farmers, as well as for small and large farmers. "From a capital expenditure standpoint, swarm farming is the only way to go," he says. "You'll be able to start with a smaller acreage and add equipment to the swarm as you add acres."

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McLae added a hydraulic cylinder to his dirt blade so he can adjust it on-the-go, welding a pivot point for the cylinder base on blade's 3-pt. mounting

## Dirt Blade Modified For Easy Control

Dale McLae can adjust his dirt blade on-the-go with the addition of a hydraulic cylinder. Adding hydraulics was a simple fix for a vexing problem.

"Whenever I bladed the driveway, I had to climb off the tractor and manually pivot the angle of the blade every time I reached the end of the road," says McLae. "Plus the blade had only two settings to choose from, not angled enough or too much of an angle."

McLae welded a pivot point for the cylinder base on the 3-point mount for the blade. He also welded mirror image brackets to either side of the pitch/angle pivot points on the blade. This allows him to disconnect the hydraulic cylinder, reverse the blade and still have hydraulic control.

"It took some measuring to figure out where the brackets should go," says McLae. "I didn't want the piston rod to run out of

room when fully extended or bottomed out. If you tell someone to only use 3/4 of a cylinder reach, you might as well tell them nothing."

McLae likes the option of using the 3-pt. blade on his skid steer as well as on a tractor. He welded a 3-pt. quick-tach plate to a skid steer quick-tach loader plate, making it easy to swap between the tractor and skid steer.

The quick-tach setup is nice, but McLae likes the hydraulic control even better. "I'm always tweaking the blade angle to match the road or dirt or whatever," he says. "With the hydraulics, I can easily adjust the angle of the blade as the amount of gravel and potholes change. Once you have it, you never want to be without it."

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Mirror image brackets welded to either side of blade pivot points are used to and reverse the blade.

## Cookie Sheet Edge Sprayer

"I made a device for spraying along the edge of our driveway and my wife's flower beds. Works great and I don't get yelled at for killing flowers or grass," says Gary Ludban, Columbia City, Ind.

He used an old cookie sheet because it was fairly stiff yet lightweight. As shown in the photo, he cut off an angled piece and used U-bolts to attach it to a spray wand on a 3-gal. garden sprayer.

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Angled piece of cookie sheet U-bolts to spray wand to prevent killing flowers or grass.



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