

# The Rise Of Robotic Lawn Mowers



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The day of robotic construction, grounds and landscape equipment is close at hand.

In fact, it has already arrived for some commercial applications.

Robotic equipment is allowing contractors and grounds and turf managers to complete tasks more safely, efficiently and cost-effectively than they could have imagined even a few years ago.

## **Safety and cost savings**

Jimmy McHenry, owner of [Dixie Lawn Service Inc.](#), Kings Mountain, North Carolina, uses Traxx RF robotic flail mowers to cut the grass and other vegetation along interstates in North and South Carolina.



The TREXX44 by EvaTech is powered by hybrid battery system and features 44-inch cutting deck.

PHOTOS: EVATECH

McHenry says the robotic lawn mowers are “a real game changer” for these types of properties. Before adopting the [Traxx RF mowers](#), he relied on employees wielding trimmers, chainsaws and other gas-powered gear to clear vegetation from sloped areas bordering the interstates.

Now, instead of sending six crew members to difficult and potentially dangerous job sites, he sends two. The operator of the mower uses a small electronic control station comfortably hanging on straps from his neck to operate the mower remotely. A second employee does the cleanup.

McHenry says using the robot has increased efficiency on these types of jobs

by 25 percent and halved his labor costs. Labor and cost savings are just part of the reason for using robo-mowers on these state transportation department properties. Safety is another much-appreciated benefit.

The driverless, rubber-tracked flail mower can knock down grass, saplings and other vegetation on slopes as severe as 60 degrees. The operator does not even need to be close to the mower. He can control it from as far away as 1,000 feet. Also, if the operator accidentally drops the controller, an emergency shut-off switch and a secondary shutdown function stop the 40-horsepower, diesel-powered machine in its tracks.

Dixie Lawn Service not only uses the robotic lawn mowers, but it is also an Alamo Industrial dealer selling and servicing the Traxx RF, which is available with a 52-inch mowing deck and a variety of attachments. The tractors are manufactured in Italy but offered through [Alamo Industrial](#) in Seguin, Texas. They're not cheap at \$75,000 to \$80,000 a unit, but McHenry says the mowers more than pay for themselves with the benefits they offer to contractors challenged by tough mowing jobs and related services.



The rugged TRAXX RF, offered by Alamo Industrial, clears sloped properties without an operator.

PHOTOS: ALAMO INDUSTRIAL

## Other market players

Luis M. Medina, an electrical engineer by training ([New Jersey Institute of Technology](#)), founded [Evatech](#) in 2003 to manufacture robotic equipment, including mowers. Today, his company produces four different series of robotic units, including three different-sized robotic lawn mowers. They range from the tiny robotic M.A.G.A., available with a 22-inch cutting deck or snow blade, to the commercial Trex 44 with a 44-inch cutting deck. The Trex (Terrestrial Robotic Explorer) is a result of "eight years of intellectual evolution and countless hours of experimentation," says Medina from his manufacturing plant in Tarpon Springs, Florida.

"I lost my job, so I had the option of working for another company or doing something on my own, which is what I did," says Medina. "I knew it would be risky, but it is paying off."

Medina holds several patents for his robotic products, including their hybrid propulsion system. He says he is manufacturing and shipping mowers worldwide. The U.S. market comprises "about 40 percent" of his sales.



The National Robotics Engineering Center in Pittsburgh is engaged in robotic mowing development.

PHOTOS: NATIONAL ROBOTICS ENGINEERING CENTER

"Our mowers are used mostly in environments that are too extreme or dangerous for operators," says Medina.

Another entrant into the robotic mower market is [Summit Mowers LLC](#), New Albany, Mississippi, which offers several small, rubber-tracked robotic lawn mowers designed to cut hillsides or other difficult terrain. Its latest commercial model, the TRX-42-PRO, is powered by a 24-horsepower [Kohler engine](#) and can cut on slopes up to 50 degrees with a 300-foot range of operation.

Mowing the rough turf of hillsides and sloped properties is one thing; mowing the fine turf found on home lawns, commercial properties, parks, golf courses and sports fields is another.

Manufacturers are not yet as far along in producing robotic lawn mowers capable of cutting home lawns—at least not on a commercial scale. No such equipment exists yet. But some industry experts predict this will change. And it may change sooner than expected.

"Within the next 24 to 36 months, you are going to see autonomous mowing equipment for commercial usage," says [Rick Cuddihe](#), a consultant who has spent his entire adult life as a player in the commercial mowing market.

Cuddihe, who worked closely with innovator Dane Scag on developing some of the key technological features on today's popular zero-turn mowers, is now heavily engaged with the [National Robotics Engineering Center](#) (NREC) in Pittsburgh. His goal is to develop autonomous commercial mowers. The NREC is an operating unit within the [Robotics Institute of Carnegie Mellon University](#). The Center works closely with clients to apply robotics technologies to real-world processes and products.



The TRX-42-Pro from Summit Mowers mows on slopes up to 50 degrees.

PHOTO: SUMMIT MOWERS LLC

## **Robotics & business know-how**

The NREC knows robotics. Cuddihe knows mowers and the business of commercial cutting. For more than a year, he has been making the 240-mile drive from his home in northern Kentucky to Pittsburgh. He spends considerable time there bringing NREC engineers up to speed on mower design and the business of mowing, and especially what contractors, golf course superintendents and grounds managers are seeking in terms of time- and money-savings.

"The NREC doesn't know a lot about cutting grass, whether it is reel mowers or rotaries," Cuddihe says. "But what they're good at—robotics—they're really good at."

Not only has Cuddihe invested considerable time in his quest to automate mowing, but he has invested personal savings as well. That's how sure he is that robotic commercial mowing will become a reality.

"Most likely, the first 100 percent robotic mowers will be for wide-area turfgrass maintenance, such as large industrial sites, college campuses and golf course fairways and roughs," Cuddihe predicts. These types of sites can often be mowed when nobody is on them, perhaps even at night.

Cuddihe is well aware that robotic mowing has to provide real and demonstrable dollars-and-cents savings before grounds managers, golf course superintendents and, especially, contractors will even give it a first look.

The most obvious savings, he says, will come from not having to pay the salary of a highly trained ride-on operator. He explains that when he and the NREC come up with a robotic solution that can be fitted to a traditional large-area mower and provide demonstrable labor cost savings to grounds managers and contractors, who wouldn't want robotic lawn mowers?

If all goes well, Cuddihe says he and the NREC could have the first unit, a robotic fairway mower, ready for beta testing within a year or so.

As for smaller commercial mowers—perhaps even zero-turns—yes, Cuddihe is convinced those will come, too.

## **Precision-guided vs. robotic**



PHOTO: SMARTPATH SYSTEMS

Steve Booher does not disagree with Cuddihe that commercial mowing is moving toward becoming robotic. But he says "precision-guided" mowing, especially on sites with big acreage, is a more realistic expectation now and into the near future. Precision-guided mowing, says Booher, is similar to the precision systems being employed in agriculture. The mower requires a ride-on operator, but, apart from the operator turning on the machine and working the throttle, the mower does all the work.

Booher started Smart-Path Systems, Columbus, Indiana, to offer just that solution. He says his Smart-Path Smart-Cut mower should be in production in April.

The Smart-Cut features GPS-guided auto-steer; the capability to record and replay mowing paths; and auto-generated cleanup boundaries. Each unit uses a two-antenna global positioning system to guide it on its path. Once the mowing path is established in the Cloud, which communicates wirelessly with the mower's computer, all the operator has to do is turn the blades on and off and use the throttle to make the mower go forward.

"You won't need a 30-year veteran mowing your golf course fairway now," Booher says. "With the Smart-Cut, you can send a kid out, and he is able to get on the machine and produce results like your veteran.

"We will be the first commercially available precision-guided system, which is a major deal," he continues. He is targeting the grounds management, turf

maintenance, golf course, right-of-way maintenance and agricultural markets.

Booher adds that the same technology employed in Smart-Cut is being used to develop a Smart-Apply machine for precision chemical applications and a Smart-Plow unit for snow management.

## **Technology and business sense**

“We know technology is going to play a big role in mower development,” says Todd Stucke, vice president, sales, marketing and product support, [Kubota Tractor](#). “But what do our customers get in return for the technology we add to our equipment?”

Stucke continues: “If you look at commercial turf where contractors are mowing properties 26 to 32 times a year, how do we get the price right on technology to make the job easier and solve problems for those companies?”

Like Cuddihe, he believes robotics will become available in large equipment, including large-area mowers, before it shows up in zero-turns used on residential properties.

Nevertheless, Stucke says he sees the benefits that autonomous mowers could bring to the commercial market. But, he adds, one thing will always be on the mind of manufacturers as they investigate the robotics route: “Safety is No. 1, no matter what.”

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