Robot Picks Up Dead Birds In Poultry Barns

Chicken producers will soon have help clearing dead birds from their production houses with a robot from Dynamic Motion. Average mortality in a large confinement setup is estimated at 3 to 5 percent, or 1,500 birds in a 50,000-head operation.

"I got the idea when Costco was first planning to build a chicken processing plant and production barns in our area," says Scott Niewohner, Dynamic Motion. "A cousin said he was interested in raising birds for them, but didn't want to deal with dead birds."

Niewohner is a self-employed problem solver, having built a lot of machinery. It was something he wanted to pass on to his son Lucas as he helped him expand his technical skills.

"He is a computer whiz, but there was no technology beyond the core curriculum at his high school," says Niewohner. "I wanted to challenge him to work with microprocessors and code."

Niewohner initially worked with a friend with the needed technical skills. While the friend wrote most of the code to operate the robot's cameras, Niewohner's son made needed changes and is now handling all programming.

The result is a machine on tracks about the size of a wheelchair. A tined loader picks up dead birds, drops them in a tray for later dumping.

As it travels through the barn, a row of small discs stirs the bedding. The litter tilling was a first step in the robot's development as Niewohner researched poultry barn conditions.

"If you can keep bedding turned, it helps maintain animal health," explains Niewohner.

They entered the prototype in the Ag Tech Innovation Competition at the Nebraska Power Farming Show this past November. The judges liked what they saw and awarded the company the $5,000 Peoples Choice award and the $20,000 grand prize.

The chicken robot is still in the prototype stage as Niewohner and his son refine the computer vision and other features needed for bird recovery.

Niewohner hopes to bring it to market within 12 mos. Meanwhile it is being used in poultry barns. One of the challenges, he explains, is to scare the birds away from the machine, but not scare them too much.

"We have half a million birds within 20 miles, and we have gone through biosecurity training so we can go in and test anytime we want," says Niewohner. "We want to have a fully functioning prototype and then find 5 to 10 early adopters to put it to work."

Niewohner is looking for someone with the right skills to help complete the project and grow with the company.

Niewohner is already working on variations of the original prototype. They include a smaller, more compact version for chicken barns and a larger version for turkey producers. He also has a version that is designed to power wash hog barns.

Meanwhile Niewohner's secondary goal has been met. His son continues to be involved in every aspect of the robot's development.

"It is awesome seeing the light bulb go on as he works with a problem," says Niewohner.

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Tracked robot uses a tined loader to pick up dead birds and drop them in a tray for later dumping.

Brent Crabtree wanted a sleeve hitch for his Cub Cadet but didn't want to spend the money for a commercial model. So he built his own out of scrap steel with help from his granddad.

Sleeve-Type Lift Hitch

Brent Crabtree used scrap steel to make a sleeve hitch for his 1993 model 1641 Cub Cadet. Then he built a box blade and modified a walk-behind tiller to fit the hitch.

"When I bought the Cub Cadet, they didn't make a sleeve hitch for my model. I looked online for aftermarket hitches, but prices were ridiculous. I decided to make my own," says Crabtree.

He did some more online research to see how the OEM lift hitches worked. "With the help of a friend, Dallas Foster, I cut triangular pieces of flat steel, drilled them out to accept the lever lift and welded them to the rear plate," says Crabtree. "We also cut a slot for the lift bar and bolted on the lower hitch link."

He fabricated the angled lift bar by welding two pieces of flat steel together. He drilled a hole in one end and attached it to the lift bar attaching plate on the hydraulic pump. This allowed him to try the lift and measure how far the lift bar moved in and out of the slot.

When he had the correct length for attaching it to the rocker arm on the sleeve hitch, he trimmed it off, drilled a hole, and pinned it in place.

Once he had the sleeve hitch, he could put it to use. One of his first projects was to build a 49-in. box blade for driveway maintenance. "I used 1/8-in. steel for the sides and back and 3/16-in. angle iron for framing them and for the cutting edge," says Crabtree.

He modified a Craftsman 24-in. walk-behind rototiller to fit the hitch.

He also decided to modify a 24-in. Craftsman walk-behind rototiller to make the job of preparing his garden easier.

"I realized I could strip it down to the engine and the tilling unit and weld a few pieces of angle iron to the frame of the tiller for lower links," says Crabtree. "I used the floating lift straps and the sleeve hitch assembly from the box blade and pinned them to a pivot point I welded to the lower links.

"The sleeve hitch and both attachments have worked really well," says Crabtree, who credits his granddad Jim Evans as providing his inspiration.

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Perforated pvc pipe goes all the way through filter and is connected to a garden hose that's capped shut at the far end.

"Centrifugal" Water Filter Cleaner

Dirty water pulled in from Lake Champlain was rapidly clogging up the "whole house" water filters at Stephen Zonies's Vermont home, so he built his own centrifugal water filter cleaner. It consists of a piece of perforated pvc pipe and a standard pressure washer.

"Our home has 3 different 12-in. long filters in it to capture particles ranging from large to small, and we were spending a lot of money to replace the filters when they got dirty," says Zonies. "The filters sell at hardware stores for about $10 apiece, and with dirty water the cost to replace them can add up quickly.

"The problem is that in late summer the lake becomes pea green with algae and churned-up sediment from wind storms. The water starts to smell and taste bad, and the sand and grit can clog up a new filter in just 3 to 4 days. Sometimes we were able to use only 100 to 200 gal. of clean water before we had to replace the filters.

"I tried rinsing out the filters in a bucket, but that didn't remove all the particles trapped inside. My homemade centrifugal cleaner cleans filters good enough that I can make them last for several more weeks, depending on how dirty the water is."

The 1-in. dia. perforated pvc pipe is suspended horizontally off the ground on a pair of wooden brackets. The pipe goes all the way through the filter and is connected to a garden hose. The other end is capped shut. Zonies drilled a series of tiny holes about 1/4 in. apart into one side of the pipe.

He positions the pressure washer with the nozzle pointed at a slight angle to the filter, and down toward the bottom of the filter. Then he turns on the hose water and starts the pressure washer.

High pressure water just touches bottom of filter, causing it to spin. Centrifugal force cleans filter from the inside out.

"I slowly work the pressure washer from one end of the filter to the other," says Zonies. "The high pressure water coming out of the nozzle just touches the bottom of the filter, which causes the filter to spin at about 200 rpm's. The centrifugal force cleans the filter from the inside out. The holes in the pipe provide water for back-flow pressure to flush particles out of the filter. The water from the pipe and pressure washer has already been filtered, so it's clean," he notes.

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