

# Tech-Savvy Inventor Builds Robotic Waterer

"I've been interested in electronics and robotics ever since high school," says Dave Dorhout, inventor of a robot waterer for greenhouses.

"Aquarius is the culmination of 18 months of research and development. It carries 30 gal. of water and can accurately water individual plants or flats of plants, reading sensors that calculate precisely how much water to apply. It can also be configured to give each plant a predetermined amount of water specified by the greenhouse manager.

"You just set it and forget it," Dorhout says. "Because of its advanced technology, it's very easy to calibrate and setup. It has only 2 switches. One turns it on and off and the other is a dial that adjusts how much water it dispenses."

Aquarius is about the size of a powered floor cleaner. It rides on rubber wheels, guided by a custom sensor under the robot that detects a track of tape placed on the greenhouse floor. Its path can be changed at any time, even when the robot is watering. The robot uses sensor whiskers much like

those on a house cat to determine the location of a potted plant and how much water it needs. It then dispenses the specified amount of water and moves on to the next plant.

"Aquarius is like the most skilled plant care technician a greenhouse has ever had," Dorhout says. "It will follow specific instructions programmed into its computer and produce repetitive plant care with 0 percent error."

"It can be used in any greenhouse that relies on hand watering without having to modify the greenhouse or provide special training to the staff. Its tank holds about 30 gallons and when that's gone, Aquarius automatically senses that it's empty, drives up to a refill station, automatically refills the tank, then returns to the spot in the greenhouse where the water ran out without missing a beat."

Precision industrial grade optical encoders guide the electric drive system and give power to each wheel so it moves forward and steers as needed. Power distribution is adjusted 10 times a second. Fully loaded,



**Robot waterer for greenhouses carries 30 gal. of water. It reads sensors on individual plants, or groups of plants, to accurately water them without any human supervision.**

Aquarius weighs about 500 lbs., but Dorhout is quick to point out his oversized worker never needs to eat a big meal for energy. "Aquarius uses a regenerative braking system common in new electric cars to recharge its batteries as it brakes. It also has 4 microcontrollers with 24 processors so it can do 24 different things at once. "It's a multi-tasking workhorse," Dorhout says, "and it's never distracted by random thoughts or loud music. It just does what you ask it to accurately and dependably."

Dorhout says the concepts and technology that he used on Aquarius can also be applied to other agricultural tasks such as feeding

or bedding cattle, collecting and harvesting vegetables, and fertilizing growing plants. "Robotics are the new frontier in agriculture," Dorhout says. "We'll be seeing many new applications in the not too distant future."

Aquarius is "built to order" and costs from \$8,000 to \$12,000 depending on final size, configuration and options such as remote or video monitoring. More information can be found on the company website.

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**Power Jetter works like a giant snake to unplug drainage tile without digging it up. It slowly pushes a solid plastic hose into tile line while injecting a stream of water at up to 500 psi.**

## Power Jetter Cleans Field Drain Tile

We recently spotted this Dutch machine that works like a giant snake to unplug drainage tile without digging it up. The Homburg draincleaner slowly pushes a solid plastic hose into a tile line as far as 1,500 ft. while injecting a stream of water at up to 500 psi. Acting like a water-spewing snake, the draincleaner uses its proprietary nozzle to wash silt and other debris from the line. The patented system cleans the line without affecting the structure of the soil or the drain tile.

The hose is inserted into the line by hydraulic motors. A meter counter shows the operator the exact distance the cleaning hose has traveled into the drain. An optional remote allows the operator to control machine functions from a distance. Finding the hose

head location in a line can also be done with an optional detection set that emits an electronic signal above ground as the line is being cleaned.

Nozzles push water out the front and rear. Different nozzle sizes are available to match the tile line size. Nozzle guides are used on larger diameter lines to ensure center placement of the cleaning hose.

All Homburg models mount on Category II or III 3-point hitches for easy tractor transport.

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## Spot Sprayer Makes Handy Waterer

Spot sprayers pulled by ATV's are handy for killing weeds, so Jim Carlson figured the sprayers would be just as helpful for watering plants. He had plenty of plants and trees—all located out of reach of his garden hose.

The Osceola, Neb., man removed the nozzle from a 15-gal. spot spray wand and put the tank in a garden wagon behind his Deere lawn tractor. He ran wires from the sprayer pump to the battery.

With many pots of flowers and vegetables and fruit trees to water, Carlson uses the sprayer every other day. Without leaving the lawn tractor seat, he drives up to plants or trees, squeezes the trigger and the pump kicks in.

"Make sure to use a sprayer that has never been used for pesticides or herbicides. I would also recommend using a 25-gal. sprayer," he suggests. He uses the smaller sprayer he had available, but has to fill it a few times to water everything.



**Carlson removed the nozzle from a spot spray wand and tows a tank behind his lawn tractor. When he squeezes the trigger, the pump kicks in.**

Watering goes much faster and prevents aching backs from hauling water in buckets, he says.

"This is really simple and works great for older gardeners," Carlson notes.

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## Dying Coalfield Equipment Coming To A Farm Near You

Windcreek Services is turning coalfield equipment that would otherwise be scrapped out or go into a landfill, into useful material for farmers and ranchers.

"We are recycling electrical equipment like breakers, transformers, panels, pumps and motors, as well as pipe of all size. We also have cattle and hog panels, fence posts, fiberglass and steel sheds, and large insulated boxes," says Tiffany Massie, Windcreek Services, Inc. "We have become innovative at 'uninstalling' pipe and wire. Recycling saves money for our customers and keeps our business profitable."

The list of items is long and extensive. Windcreek's Asset Recovery System is removing the materials from a dying coal bed-methane gas field near Gillette, Wyo. The company is reselling everything possible, even limestone rock.

"Customers are using the insulated boxes and sheds for calf warmers, mailboxes, hunting blinds, garden sheds and more," says Massie. "One of our crews even built a car out of recovered parts and products."

Other reuses cited by Massie include steel and fiberglass tubing for fences, pens and building materials. Guards used around surface valves make tree guards, and the backs of steel electrical panels have been stripped and used for trailer sides, wind breaks, floors, shelves and dividers.

She adds that people with water well maintenance needs will find lots of 3-phase motors, submersible pumps and down-hole tubing and cables.

Contact: FARM SHOW Followup, Windcreek Services, Inc., P.O. Box 2410, 310 Limestone Ave., Gillette, Wyo. 82717 (ph 307 687-2056; www.windcreekinc.com).



**Windcreek Services says its used coalfield equipment can be turned into useful material for farmers and ranchers, such as fencing panels and pipe of all sizes.**



**Customers use insulated boxes and sheds for calf warmers, mailboxes, hunting blinds, garden sheds and more.**