

Bird-deterrent drones are being developed and tested by a University of Washington research team.



Deterrent Drones Fly The Sky To Save Crops

A Washington State University (WSU) research team is using automated drones to keep pesky birds away from valuable crops. The hands-free system can patrol 24/7 to keep starlings, crows and other flying fowl away during daylight and possibly other pests like raccoons and deer away at night.

WSU's Manoj Karkee says producers who grow valuable grapes, cherries, blueberries, raspberries and apples currently don't have an economical way to keep pests like crows and starlings away. Losses in Washington alone are estimated at more than \$80 million. Field-mounted nets, electronic devices, air horns, and fluttering fabric visual scare devices have limited success because they're sight specific and don't cover large areas. The WSU system detects and counts pests with cameras, then deploys drones to scare them away with

motion and whirring noises from the rotors. Karkee says other sounds like distress or predatory bird calls could be added. Drones could also be made to look like predators and use reflective rotor blades.

WSU first tested the system with manually-operated drones making random flights, which successfully drove birds away from vineyards, reducing their presence four-fold. The second test showed that driving birds away resulted in 50 percent less damaged fruit. They're now working with growers and technology companies on a system that can be produced and marketed commercially.

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"Our tire limits and even reverses deep rutting, one of the biggest problems facing irrigation tires," says Derek Westra, Evolution Wheel's marketing specialist.

Airless Worry-Free Pivot Tire

Evolution Wheel created their EWRSPivot series airless tires with individual segments, each bolted to a steel rim. If necessary, these segments can be replaced separately using only a 3/4-in. socket right in the field.

The no-flat tire is engineered with unique core hole geometry that compresses like traditional air-filled tires for improved traction. This compression feature makes the tire self-cleaning by pushing out any extra material that could add weight.

To maintain traction over hills or around obstacles in wet fields, the tire features a true-to-spec 14.9-in. by 24-in. build with increased surface area. Its concave profile offers an aggressive bidirectional tread design to maximize traction and floatation with a convex shape that pushes mud out from under the tire, causing ruts.

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Wheel's marketing specialist.

He believes the EWRSPivot series center pivot irrigation tires have both the benefits of an airless tire and the compression of air-filled, pneumatic tires. Their high-quality rubber also contains special UV protection to prevent rubber deterioration and increase longevity.

The EWRSPivot series tires measure 48 in. in diameter and 14 in. in width. They weigh 330 lbs. and are rated for a maximum load of 5,000 lbs.

Westra says Evolution Wheel owns the entire manufacturing process of the tires and only uses the highest quality North American materials. Interested customers should contact the company for pricing information.

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Portable Nutrient Meter Reads Produce Quality

Four years ago, the Bionutrient Food Association (BFA) introduced its first version of the Bionutrient Meter, an instrument designed to bring what could only be accomplished in a laboratory directly to the grocery store or market stand. Its goal is to provide consumers with the ability to point a handheld spectrometer directly at produce and receive a reading of which fruit or vegetables contain the highest amount of nutrients.

Spectroscopy is a safe technology as it uses non-invasive flashes of light to determine the makeup of materials. Farther down the road, the BFA hopes this technology could be integrated into a cellphone lens as a standalone meter.

"Unlike refractometers that read Brix content by sampling and damaging fruit, the nutrient density meter will provide its result by simply touching the produce," says Steve Groff, author of "The Future Proof Farm." "It will determine nutrient and vitamin levels giving a readout not of parts per million (PPM) but a level under or over the average."

Groff says roughly 300 BFA members around the country are currently using version two of the meter to help build an online results database for comparisons.

"We're at about 10,000 data points now, but that's not enough to build an accurate data library. We're trying to be consistent with gathering data, plus, right now we're sending in soil tests from around the very plants we're taking our readings from."

He says an exciting result of their research is that while there are many outside influences, they're finding higher nutrient-level produce is coming from healthier soils.

"There's a correlation between healthier soil and more nutrient-rich," Groff says. "We've primarily been practicing no-till, not disturbing the soil, and using cover crops for environmental reasons. That's good, but now these exact things are proving to be a prerequisite for healthier crops such as tomatoes, corn, squash or soybeans fed to animals."

Groff believes when consumers use the meter, a side benefit will identify which suppliers are growing the most nutrient-dense produce. The present system pays producers



Bionutrient Meter is used to tell if nutrient and vitamin levels of produce are under or over average without damage to the produce.

by yield rather than quality, but there hasn't been a way to accurately measure quality other than sending produce to a lab and waiting for results.

The BFA hopes by giving consumers this technology it will help them make purchasing decisions that could affect overall food quality.

The Bionutrient Meter is still potentially years away according to Groff, but it will be refined with more data points and undergo a succession of soft launches until a final product is produced.

"It will be a game changer," Groff says. "I believe agriculture's future is going to be based on increased nutrient density or richness in the products we grow. If we have biology in living soil, we'll have a healthier, more robust product. The Bionutrient Meter is part of that equation."

The Bionutrient Food Association hopes to manufacture and eventually sell the handheld meters for approximately \$100 each.

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"No Flat" Tires For Center Pivots

Zimmatic's NFTrax® 2.0 provides a new tire option for pivot irrigation systems.

"It's the last tire you will need to buy," says Sahil Sharma, product manager for Zimmatic. "The track is replaceable."

Introduced in 2019, NFTrax was designed to save irrigators time fixing flat tires and dealing with deep ruts created by tires during high run times.

"It's a heavy-duty tire supported with steel bars," Sharma says of the track's design. "Every pressure point falls between two lugs that boost floatation."

Field tests showed that wheel track depth is 30 to 50 percent less than standard 11.2 x 38-in. tires in similar conditions. In addition to the standard model, the optional NFTrax Z-Tread features a more aggressive tread for slopes, low spots and heavy soils.

NFTrax comes with a 5-year warranty and is designed to fit Zimmatic irrigation systems as well as a few other systems. Videos and more information are available on the website.

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