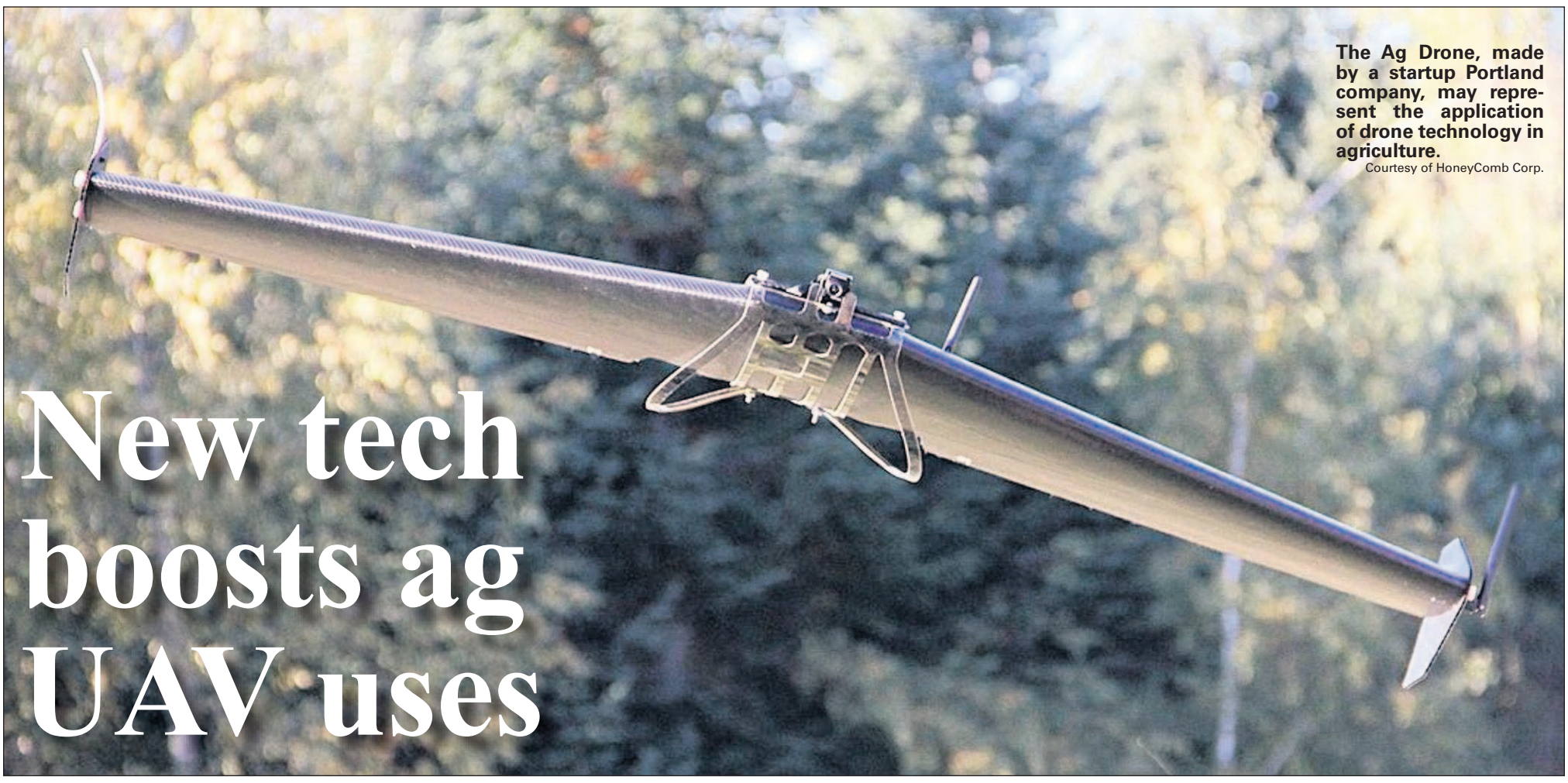

The Ag Drone, made by a startup Portland company, may represent the application of drone technology in agriculture.
Courtesy of HoneyComb Corp.

New tech boosts ag UAV uses

By SEAN HART
EO Media Group

New unmanned aerial technology is rapidly expanding its agricultural uses.

Two presentations are planned at the Farm Fair this year to explain the latest advancements that can help farmers save time and money.

Lav Khot, an assistant professor in agricultural automation engineering at Washington State University, will explain the advancement in capabilities of small and mid-size unmanned aerial vehicles.

"A lot of things are happening," he said. "The industry is becoming very dynamic."

When the aircrafts were first being used for agricultural purposes, Khot said the focus was on improving the crafts themselves. Then researchers began to focus on improving the sensors the crafts could carry, he said, followed by increasing the flight time. Now, he said, the industry is shifting to focus on the particular data collected and how it can be used.

Khot said UAV sensors can gather a variety of different types of information, such as crop temperatures, irrigation effectiveness and crop color. The information can help farmers make real-time decisions, he said, and as the technology is improved, it will be even more effective.

Khot said he is currently researching the effectiveness of using the rotor wash from a mid-size rotorcraft UAV — between 55 and 1,000 pounds — to dry the canopies of sweet cherry trees in Washington and Oregon. He said the university is also studying different applications for small UAV systems — up to 55 pounds — such as hail damage and pathogens in potatoes.

Chad Higgins, an assistant professor from Oregon State University's Water Resources Graduate Program, said the UAV industry is "booming."

"There's more and more people flying," he said. "We're in a phase of discovery of all the things we can actually get done."

He said he has been researching UAV use to detect atmospheric motions, such as evaporation, which can improve water management and frost protection. Using a distributed temperature system consisting of a fiber optic cable and a laser, Higgins said he can determine down to an area as small as five inches where frost may be a problem in a fruit orchard — "down to the level of the fruit."

New lidar technology, which analyzes the light reflected back from objects illuminated by a laser, will soon be able to create three-dimensional images of "every leaf and every fruit" on a tree, Higgins said.

"We're on the edge of that," he said. "That's where we can go with these types of technologies. It's a time of immense innovation."

FAA UAV regulations

In an industry taking off as fast as unmanned aerial vehicles, regulations can take a little longer to get off the ground.

Khot said the industry is prospering in Canada and other areas but is still being held back in the United States by federal regulations. He said he anticipates the Federal Aviation Administration will release new rules next year that he hopes will provide more clarity.

"The FAA is trying to keep pace with the industry," he said. "The new rules that are coming out hopefully will be geared more toward these systems."

To comply with current regulations, a UAV must receive a certificate of authorization from the FAA, according to Higgins.

"This is a very long and involved documentation process where you have to attest to the flightworthiness of the platform (UAV), and you have to declare an air space you're going to operate in," Higgins said. "This process can take months."

Even then, a licensed pilot must fly the craft along with a copilot who has passed a flight physical to monitor for safety issues, he said.

Although a UAV can be relatively inexpensive and straightforward to fly with practice, Higgins said the regulations are a barrier to entry for many people.

"There are efforts to make it easier and simpler, but the FAA is a conservative organization and rightfully so, because there are safety issues at stake," he said. "I'm sure they're going to move slowly toward a more efficient path, but it will be a safe path."

Higgins said he and two other Oregon State professors also operate the Center for Transformative Environmental Monitoring Programs, which is funded by the National Science Foundation. Although the center must charge for its services to cover its costs, Higgins said it provides reasonably priced help for people who want to use UAV systems.

The center has crafts, sensors, licensed pilots and people who are knowledgeable about industry regulations and efficient use of the technology, he said.

"We're prepared to provide logistical support to help people use UAVs and use them legally," he said. "We basically listen to people and what they want as their ultimate outcome, and we facilitate that until it's achieved."

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