New robot picks a peck of peppers and more

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The world's most advanced sweet pepper harvesting robot, developed in a consortium including Ben-Gurion University of the Negev (BGU) researchers, was introduced last week at the Research Station for Vegetable Production at St. Katelijne Waver in Belgium.SWEEPER is designed to operate in a single stem row cropping system, with non-clustered fruits and little leaf occlusion.The Ben Gurion U. team spearheaded efforts to improve the robot's ability to detect ripe produce using computer vision, and has played a role in defining the specifications of the robot's hardware and software interfaces, focusing on supervisory control activities. Credit: Research Station for Vegetable Production at St. Katelijne Waver

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SWEEPER is designed to operate in a single stem row cropping system, with non-clustered fruits and little leaf occlusion. Preliminary test results showed that by using a commercially available crop modified to mimic the required conditions, the robot currently harvests ripe fruit in 24 seconds with a success rate of 62 percent.

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Polina Kurtser, a Ph.D. candidate in the BGU Department of Industrial Engineering and Management and member of the team, says robotic harvesting will revolutionize the economics of the agriculture industry and dramatically reduce food waste.

"The Sweeper picks methodically and accurately," she says. "When it is fully developed, it will enable harvesting 24/7, drastically reduce spoilage, cut labor costs and shield farmers from market fluctuations."

Additional research is needed to increase the robot's work speed to reach a higher harvest success rate. Based upon these latest results, the Sweeper consortium expects that a commercial sweet pepper harvesting robot will be available within four to five years, and that the technology could be adapted for harvesting other crops.

North America is the second largest producer of sweet (bell) and chili [peppers](link) in the world with a 31 percent market share. In 2017 Europe accounted for more than half the world's pepper supply (53.2 percent) with exports valued at $2.7 billion.

SWEEPER is a partnership between BGU, Wageningen University & Research, and pepper grower De Tuindershoek BV, in the Netherlands, Umea University in Sweden, and the Research Station for Vegetable Cultivation and Bogaerts Greenhouse Logistics in Belgium.

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