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Chinese researchers discover that watermelons grow faster at night

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Recently, a wearable electronic sensor for plants has been jointly developed by LIU Xiangjiang and YING Yibin from the College of Biosystems Engineering and Food Science, WANG Xiaozhi from the College of Information Science and Electronic Engineering, and HU Zhongyuan from the College of Agriculture and Biotechnology.



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Recently, a wearable electronic sensor for plants has been jointly developed by LIU Xiangjiang and YING Yibin from the College of Biosystems Engineering and Food Science, WANG Xiaozhi from the College of Information Science and Electronic Engineering, and HU Zhongyuan from the College of Agriculture and Biotechnology.

Meanwhile, they found that fruit growth and photosynthesis are not synchronized, which not only alters people's long-standing perception of the plant's growth and development process but also opens the door to new technologies in high-yield crop breeding and cultivation.

A plant-wearable sensor capable of continuously monitoring the stem flow

It is the rising fluid flow in the stalk of plants under internal and external pressures such as transpiration and osmotic potential. Therefore, continuous real-time monitoring of stem flow enables researchers to resolve the mysteries of water and nutrient distribution, signaling, and responses to the environment.

The Intelligent Bio-industrial Equipment Innovation Team (IBE), the Institute of Smart Sensor and Micro/Nano Systems (ISSMNS), and the Vegetable Germplasm Innovation and Molecular Breeding Team carried out inter-disciplinary research and developed a plant-wearable sensor based on the idiosyncratic physiological traits of plant stems and a wide range of recent advances in materials, micromechanics and nanofabrication.

New discovery altering the traditional understanding of the watermelon growth

Researchers installed sensors at several key sites on the stem of watermelon and observed the continuous and dynamic distribution of water in different organs, such as leaves, fruits and stalks, without any damage.

Watermelon is primarily composed of water (roughly 95%). However, according to data from stem flow sensors, only a small amount of water (5%) is transported to the fruit for growth at the daytime, while virtually all water is transported to the fruit at nighttime.

These findings imply that the accumulation of fruit fresh weight mainly happens during the night, which is contradicted with the common view that the fruit growth rate should be synchronized with the photosynthesis activities.