



Three Arabidopsis leaf surface pores | Photo source UCSD

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NANOSENSOR MEASURES PLANT STRESS IN REAL-TIME, HELPING FARMERS ADJUST TO ENVIRONMENTAL CHANGES

 AGRICULTURE & ENERGY

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Spotted: A University of California San Diego team of plant biologists have built a nanosensor that tracks real-time changes in plant cell enzymes. The team studied the kinases enzyme because it triggers the opening and closing of small pores on the surface of leaves. In order to prevent too much water from evaporating from the plant, the pores close when drought conditions are detected.

Named SNACS, the nanosensor measures SnRK2 kinases (sucrose-non-fermenting-1-related protein kinase-2s) which live in plant cells. Previous methods of monitoring changes at cellular level frequently involved grinding up hundreds of leaves. Having the ability to monitor changes in enzymes as they happen is a particularly useful advance for growers who could more efficiently allocate resources.

With temperatures around the world rising, the environmental stresses on plant and animal life are increasing in number and in severity. Development plans for the sensor include strengthening its analysis capabilities and investigating opportunities for tracking additional adverse conditions.

Other means Springwise has spotted of improving plant health and agricultural yield include [planting patterns](#) and next-gen [aeroponics](#). Planting some of the world's most common food crops, such as soy and wheat, in a uniform grid pattern has been found to significantly improve soil health. At the

same time, soilless solutions enable traditionally hard to cultivate environments such as crowded urban areas and deserts to greatly improve food production.

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Takeaway:

Technology is transforming agriculture. From Internet of Things water management to text messages alerting farmers to early-stage crop disease, there are a range of innovations helping to change subsistence farms into thriving small businesses. It would be useful if best practices were shared worldwide to enable further development and broader adaptation of the most successful initiatives, within sectors as well as between. One such example is nanosensor technology currently being deployed to help reduce food loss, which could have further applications earlier in the supply chain.