

Low-cost moisture sensor a boon for farmers

Easy-to-use equipment is powered by solar cells

BENGALURU: A group of researchers from the Indian Institute of Science (IISc) and IIT-Bombay have designed a low-cost soil moisture sensor that can accurately determine the water content of soil and has the potential to become a boon for farmers throughout the country.

Soil moisture is one of the most crucial determinants in agriculture and since farm output is directly linked to moisture content in the soil, an easy-to-use soil moisture sensor is an essential tool for a country like India.

So far, the most common

way of finding soil moisture is to measure its ability to store heat. However sensors based on "heat pulse" have two basic challenges. One, it is very expensive and two, it consumes a lot of power. The soil moisture sensor developed by the researchers is cheap and requires little power to run. Powered by a solar cell array, the sensor works for three days, non-stop.

Components used

Prof G K Anathasuresh, Professor of Mechanical Engineering, Indian Institute of Science, Bangalore, who head-

ed the research, said: "This (low-cost sensor) was achieved with proper material selection, geometry of the heater probe, signal conditioning and amplification, and of course, hard work by students."

The researchers calibrated the sensor against white clay, whose properties are well-known and documented, and tested on red soil which is commonly found in South India. The sensor can test different kinds of soil and accurately measure moisture content up to 30 per cent, which is above the saturation limit for most variety of soils.

Besides, the nature for soil moisture is essential for agriculture. It directly influences long-term climatic conditions like hydrological process and drought development. On a much shorter time-scale, it acts as a carrier of nutrients to plant roots, and helps sustain life on earth. In fact, in 2010, soil moisture was recognised as an Essential Climate Variable, a release from IISc said.

The new sensor designed by the team is currently undergoing field trials and is expected to be affordable.

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