

New soil monitoring technology can help farming decisions

Soil is for the farmer what the pulse is for the doctor. It helps them take decisions about when to irrigate, when and what to sow, use nutrients and so on.

While, some farmers have indigenous knowledge of detecting soil moisture and health, such knowledge is confined to only a few. Taking farming decisions on the basis of soil moisture and health have become even more difficult in the age of climate change.

A technology called Soilsens -- a low cost smart soil monitoring system has come as a potential help to farmers facing farming decision predicaments. Soilsens product line is developed by Proximal Soilsens Technologies Pvt. Ltd, a startup incubated at Indian Institute of Technology Bombay (IITB), Mumbai with support from the Ministry of Department of Science and Technology (DST) and Ministry of Electronics and Information Technology (Meity). Proximal Soilsens started with a mission to build affordable technologies for precision farming. The idea is to “create wealth through sustainability”. The system is embedded with soil moisture sensor, soil temperature sensor, ambient humidity sensor, and ambient temperature sensor. Based on these parameters, farmers are advised about optimum irrigation through a mobile app. This data is also available on cloud. There is also a portable soil moisture system.



The technology can help improve efficiency of water usage in agriculture and finds application in open farms, green houses, gardening and research and agricultural labs. It can help with guidance about ways to optimise water usage as per the requirement of crop and soil (Crops, flower, fruits). In case of limited water resources, the farmers can detect and limit watering to only at critical phase of the crop cycle thus not affecting overall yield.

The system can also help avoid over irrigation, thus protecting crops from diseases, saving water, electricity, predict early onset of diseases and offer advisories. In case of erratic electricity farmers can switch on the irrigation equipment (sprinklers, drip, pumps) with the convenience of mobile and preventing leaching of nutrients from soil.

The scientists have indigenously developed the sensors and systems thus keeping the cost very affordable. It is almost 1/6th of the cost of commercial systems which are currently imported. The developed technology will not only benefit the farmers but will also be useful to the agricultural institute and research labs, which are currently using high cost imported products with no support from them.

“Our mobile app is in different Indian languages to suit Indian farmers. As far as the technology is concerned, we have tested it in open fields for last two years in all different seasons and for different crops. The sensor can be installed at any depth as per the crop requirement and can be installed in any crop and in any soil. Data can be monitored and advisory can be given. When the moisture goes below the pre-set threshold value, it alarms the user about the irrigation. It also collects the data about soil temperature, ambient humidity and ambient temperature which can be used for early prediction of plant diseases” says Dr. Mangesh Gurav who is CTO and co-founder.

Powered by a battery, the system is charged by solar panel and does not require any external power supply. It is a modular system designed keeping in mind the Indian agricultural community. Height of the system is adjustable and it can be varied from 1m to 3m based on the height of the crop. Data from all the sensors are logged into a cloud using IoT platform.

The Soilsens team have carried out pilots for two years across various crops in different states in order to check the robustness and stability of the system before bringing it to the market for commercialization. These pilots have shown 22% saving in water and electricity and 20% improvement in yield in potato crops.

They have generated revenue by doing some commercial pilots with the corporate sector. The SMART system with various sensors, software, dash-board, mobile app and GSM subscription for 3 months costs approximately 25k which can be reduced with volumes.

“We plan to start with B2B approach where the customers are from the corporate sector, FPOs, research institutions. Slowly we will move to polyhouses, cash-crop farmers and marginal farmers. The cost of the system to marginal farmers will be subsidized either by Government or by some other means. The approximate cost for the marginal farmers would be 10 k, said “Dr. Rajul Patkar, CEO and co-founder of Proximal Soilsens Technologies Private Limited.

Depleting ground water and huge losses due to diseases is increasingly making agriculture unprofitable and unsustainable. Affordable technology can help the farmer to grow more crop

per drop and improve yield by predicting and controlling diseases in time. This system can help the farmer to deal with both of these problems.