



**FPARP  
Action Sites  
in Tamil Nadu**

**Patent pending** : 2685/CHE/2010

**Design patent Nos** : 231432, 231433, 231434 and 231435  
dated 14-09-2010

**Script** : K. Hari, D. Puthira Prathap, K. Sivaraman, P. Rakkiyappan,  
B. Singaravelu, A. Ramesh Sundar, P. Murali & C. Karpagam

**Technical assistance** : S. Vidya Sekar, S. Naveenkumar & S. Selvakumar

**Further information:**

Dr. D. Puthira Prathap  
Principal Investigator, FPARP – II,  
Sugarcane Breeding Institute (ICAR)  
Coimbatore – 641 007  
Phone: 0422-2472621.Extn.238; sbi.fparp@gmail.com  
Visit : [www.caneinfo.nic.in](http://www.caneinfo.nic.in)

Published by Dr.N.Vijayan Nair, Director, Sugarcane Breeding Institute,  
Coimbatore – 641 007, as part of "Farmers' Participatory Action  
Research Programme Phase - II" (C1-11/5.1.16) sponsored by  
Ministry of Water Resources, Govt of India

# Using Soil Moisture Indicators in Sugarcane Farming



Farmers' Participatory Action Research Programme (FPARP)



**SUGARCANE BREEDING INSTITUTE**  
**(INDIAN COUNCIL OF AGRICULTURAL RESEARCH)**  
**COIMBATORE - 641 007 TAMIL NADU, INDIA**



## BACKGROUND

Depletion of available water resources in agriculture is a cause for concern. More so when you cultivate water-guzzling crops such as paddy, banana and sugarcane. While efficient irrigation management practices should be mandatory in Sugarcane crop which remains in the field for almost an year, in most of the sugarcane farmers' fields, irrigation scheduling based on soil moisture status is not in practice. During 2008-10, Sugarcane Breeding Institute (SBI) had conducted a series of on-farm trials in different locations as part of FPARP (Farmers' Participatory Action Research Programme) on various water conservation techniques, one of which was scheduling irrigations based on soil moisture status using the Tensiometer (a popular device for measuring soil moisture) . This considerably reduced the number of irrigations required for cultivating the crops without affecting the yield, thereby saving considerable quantity of water. However, there were certain drawbacks linked with this device such as higher cost, multiple installations, regular filling of water, regular blockages, damages to the ceramic cup, and other maintenance issues.

Considering all these problems, SBI has successfully developed a simple and farmer-friendly electronic soil moisture-indicating gadget which has been named as 'Soil Moisture Indicator (SMI)'.

## CONSTRUCTION OF SMI

SMI comprises a sensor rod and a casing. There are either two metal sensor rods (two individual rods spaced at a distance of about 3 cm). The casing houses an electronic printed circuit board with an integrated circuit, electronic components, ten lamps / LEDs, a provision for batteries and an on/off switch.

**Table -1 Reading Soil Moisture status from SMI**

Colour of LED glow	Soil Moisture Status	Inference
Blue	Ample moisture	No need for irrigation at all
Green	Sufficient moisture	Immediate irrigation may not be necessary
Orange	Low moisture	Irrigation advisable
Red	Very low moisture	Immediate irrigation necessary

## ADVANTAGES

- ◆ Suitable for use in agricultural farms as well as in potted plants
- ◆ Instant indication of soil moisture status
- ◆ Suitable for different soil types
- ◆ Low cost (about Rs. 500/-)
- ◆ Indicates soil moisture level with more objectivity by ten different coloured LEDs



## HOW TO USE AN SMI ?

To assess the soil moisture, the sensor rods need to be inserted into the soil to a required depth (about 30 cm). The resistance between the sensor rods depends on the moisture content in the soil between the rods. The electronic circuit is designed in such a way to display moisture levels by glow of one lamp out of ten lamps (See Table-1). A provision is given in the gadget for fine-tuning so that the gadget can be suited for different soil-types and irrigation water .

## WHAT DO THE USERS SAY ?

The SMI was developed from a 'Participatory Technology Development' (PTD) approach with the active participation of sugarcane growers across three agro-climatic zones of Tamil Nadu. The feedback from the users about this device has been encouraging. A few participant farmers of the 'Farmers Participatory Action Research Programme' have found this device useful not only in flood irrigated fields but also in micro-irrigated fields. By scheduling their irrigations, these sugarcane farmers could save considerable amount of precious water.

