



August 2009

## The Campbell News

With the late arrival of the monsoon this year over many regions in India, coupled with the severe lack of rain thus far in most areas, drought conditions are already causing serious concern for farmers. Unless the situation changes soon, the rainfall deficit of 2009 will affect many different crops and farmers, especially those who lack irrigation ability. It is with this in mind that much research is taking place right now in India to develop drought resistant crop varieties. My recent trip to south India reminded me just how many customers depend on Campbell Scientific products to obtain quality data for their work in their quest to assist Indian farmers. With quality data comes quality research. I was reminded by one customer that “we can't eat Rupees” and therefore the research continues. I appreciate the customers that took the time to educate us about their applications. This newsletter discusses two applications of our products although not in the south (these will be featured in future editions). The first one studies pre-monsoon conditions and the other, a growing method to help farmers increase productivity.

Enjoy this second edition. If you have any suggestions or have a project that may benefit other users, please contact Elcome Technologies Pvt Ltd. (see back). We are always interested in our clients' projects and sharing these with other Indian users.

Sincerely,  
Robert Herfst, International Marketing Manager  
Campbell Scientific Canada

## Thunderstorm Development Study



Dr. Mandal at 50 M Tower

In the pre-monsoon season, March to the end of May, the West Medinipur region of West Bengal experiences the Nor'wester storm. These are localized intense thunderstorms that begin to develop on the Chotanagpur Plateau. The large areas of exposed bedrock on the plateau contribute to create thermals when the skies are clear (pre-monsoon) and solar radiation levels are high. These thermals are dry and warm. As northwestern winds carry this dry air towards the Bay of Bengal, they pick up moisture which, in turn, often progresses into thunderstorms. These storms are famous for their intense lightning which damages property and kills animals and humans. To better understand the lifecycle of these events, IIT Kharagpur has installed a 50 meter tower with sensors at 6 levels to profile the atmospheric conditions.

Dr. Manabottam Mandal of IIT Kharagpur has been studying these storm events for many years and is cooperating with researchers at Jadavpur University and BIT Ranchi. Together they take a multi-discipline approach to understanding these phenomenon. The system uses the [CR3000](#) along with multiplexers to increase the number of channels. Data retrieval is accomplished using a RAD modem system.

To learn more about this project, contact:  
Dr. Manabottam Mandal,  
Assistant Professor  
IIT Kharagpur, Kharagpur - 721302, INDIA.  
Tel: +91-3222-281822 (O)  
Email: [mmandal@coral.iitkgp.ernet.in](mailto:mmandal@coral.iitkgp.ernet.in)

**For more information on Campbell equipment in India, please visit the “[Applications](#)” section of our website or visit us at the [National Conference on Renewable Energy](#) in Jodhpur, Rajasthan from November 5-7, 2009**



Mr. Kumar, Greenhouse Study

## Greenhouse Study to Optimize Production of Gerbera Flowers for Maximum Economic Benefit

As the Indian economy continues to develop, opportunities have arisen where farmers can earn higher incomes by growing flowers for ornamental or ceremonial purposes versus traditional cash crops. Although the national demand is not yet capable of supporting large scale flower production, foreign market demand already exists. This has created an opportunity for farmers to switch to alternative products and make a healthy living.

Mr. K. Srinivas Kumar of IIT Kharagpur has created a research project to study the effects of various growing techniques to increase flower production. The study involves growing Gerberas in a greenhouse and then manipulating the conditions to determine what variables and conditions produce the maximum flower output and can be duplicated by Indian farmers in a cost effective manner. Gerberas were the chosen plant species because of their economic importance.

Some of the variables being changed are: solar input, ventilation, irrigation, soil inputs, and bed structure (ex: raised beds). Changing a single variable (temperature, moisture, sunlight, etc) often causes visible results in the crop within a week. By measuring the changes with the [CR1000](#) system, Mr. Kumar can quickly ascertain what modifications produce the best results. The empirical data helps qualify conditions and accurately measure the effects of the changes. Gerberas growing outside the greenhouse in the traditional way provide the experimental control. Preliminary results suggest the initial investment of the greenhouse (Rs ~75,000) will pay off after just 12 months of production. With continued study, IIT Kharagpur hopes to be able to present these new methods to area farmers to help improve their livelihood.



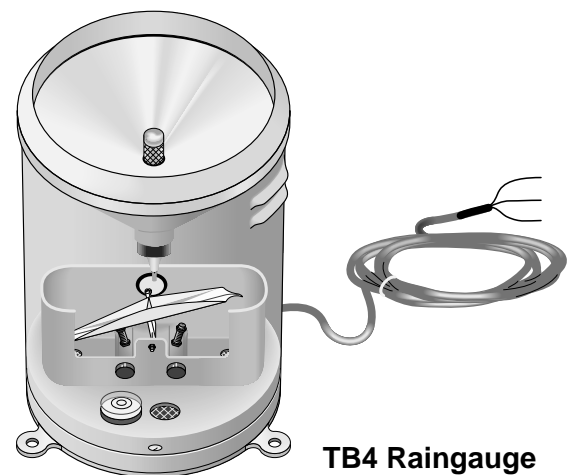
CR1000



Gerberas in Greenhouse

## Metric Version of Rain Gauge Available

The rate of rainfall is one of the most important specifications to consider when choosing a rain gauge. Campbell Scientific offers a number of rain gauges to meet the rain intensity requirements of different locations. For most India installations, a sensor with siphon ability is required to accurately measure the high-intensity rainfall events. This mechanism allows the rain to flow at a steady rate regardless of rainfall intensity, thereby preventing loss of sample. The [TB4](#) model produces accurate measurements over a range of 0 to 700 mm/hr in 0.2 mm increments. For low intensity rainfall, the model [TE525M](#) is sufficient.



Watch for our next issue to be released in December 2009