CALIBRATION STANDARDS FOR CONTROLLED ENVIRONMENTS: HISTORY AND USE OF THE NCR-101 INSTRUMENT PACKAGE

S. Klassen, T. Tibbitts and B. Bugbee

Crop Physiology Laboratory, Utah State University, Logan, UT USA. (Email: stevek@cc.usu.edu)

In response to a need for uniform standards for controlled environment research, the NCR-101 group began assembling a set of reference instruments over 20 years ago. Of particular interest and emphasis has been the accurate measurement of radiation including photosynthetic, short wave, long wave, and most recently ultraviolet radiation. Radiation sensors in the package include:

Pyranometer (Eppley Lab Inc., model PSP, 285-2800 nm),
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Pyrgeometer (Eppley Lab Inc., model PIR, 4-50 μm),
Red/far red sensor (Skye Instruments, 660/730 nm),
UV sensor (Apogee Instruments, 250-400 nm), and
Three quantum sensors (LI-COR, 400-700 nm).

The package also contains an anemometer (TSI) and a data logger (Apogee Instruments) programmed for use with all the sensors. A spectrometer (StellarNet) was recently purchased and we are currently testing its performance.

The package serves two functions:

to provide a set of standards that can be used to check the calibration of members own instruments thus improving uniformity among studies in different controlled environment facilities, and
to provide members with unique instruments for characterising greenhouse and growth chamber environments.

The package is circulated by mail among the members for a fee of $300 (US). The fee helps to cover costs associated with managing the package including annual recalibration of the instruments. This paper will discuss the philosophy of the need for the package and provide an overview of the instruments and their use.