

**NCR-101 Committee on Controlled Environment Technology and Use
Cornell University - Ithaca, New York
27-29th March, 1999**

Highlights

1. Calibration Instrument Package

Four New LI-COR sensors were purchased for the instrument package that is maintained and administered by Bruce Bugbee and Steve Klaussen at Utah State. Several of the instrument package sensors were sent back to the manufacturers and recalibrated, some for the first time in a decade. Most of the sensors were still accurate (within a few percent). A new instrument set has been put together for the calibration of photosynthetically-active radiation (PAR) sensors. This set includes a variable Quantum Integrator (eight input channels) with a calibrated plate that can test five unknown and three known PAR sensors.

Bruce Bugbee gave a special report on the long-term drift of LiCOR quantum sensors. It appears that about 30% of LiCOR quantum sensors may be sensitive to humidity (which is not taken into account by recalibration at LiCOR). Ten normalized sensors tested by Bugbee and Klaussen ranged from 4% high to 4% low (a steady drift in 6 months). Three sensors were chaotic (15% high / low) over a 60 day period. These sensors were then sent back to LiCOR for recalibration. LiCOR found no drift in the sensors, or error in the assembly. There appears to be a humidity factor with some LiCOR sensors. LiCOR indicated that this was of real concern to them and they intend to pursue the matter.

Bruce Bugbee proposed to the committee members that an UV / visible spectrometer be added to instrument package (Model EPP 2000C with UV upgrade). A motion was made to authorize Bruce Bugbee to purchase the Spectrometer using instrument package funds. This decision was subject to the spectrometer having no major flaws and it performing acceptably within 30 days of purchase.

2. Internet Homepage <http://www.ncr101.duke.edu>

The NCR101 Webpage was officially launched at this spring meeting. Donald Krizek gave a formal vote of thanks from the group to David Tremmel from the Duke phytotron for all the hard work that he has done on the website in the past year. David gave an overview of the site, which starts with the history of the NCR101 group by Robert Langhans and Ted Tibbitts. Activities of the group are listed together with information exchange, publications, officers and members, with links to government agencies, controlled environment facilities, working groups and industry links. Additional links are given to other controlled environment (International) groups and facilities (e.g. in Australia and New Zealand). Future additions to the Webpage will be measurement and reporting guidelines, with peer-reviewed information on instruments, calibration and data collection techniques associated with those instruments. This will be a resource for scientists as well as journal editors. A limited reference database has been proposed which will be organized by key word and subject areas. A motion to publish the minutes of the committee meetings and station reports on the Webpage was carried.

3. Membership Update:

Mark Romer mentioned that the membership increased by 28 members this year, with three deletions (net gain of 25 members). The membership is composed of 118 representatives from 66 institutions. The institutions fall into 4 broad categories: Academic, Government, CE facilities and Industry. The membership database is now three years old. Membership details in the database will include Director, Institution and member information from this year.

4. Proposal for 2001 Meeting in Norwich, UK

Background. The idea for an International meeting in England was suggested at the 1998 NCR101 meeting, which was strongly supported by Dr. Kanwar. Royal Heins and John Lea-Cox followed up at ISHS in Brussels in August, 1998 and got in touch with Dr. Lynton Incoll at Leeds University. Following the UK Controlled Environment group meeting in September, where the proposal was put to the UK members, an outline for the meeting was put together for consideration at the Spring, 1999 meeting. The US committee decided to conduct an email poll (supported by 92% of the membership) to invite Dr. Incoll to the 1999 meeting at Cornell to give a presentation to the members.

Dr. Incoll introduced himself and expressed his thanks to the members for supporting his trip. He is based at Leeds University, and is involved in CE through the management of about 25 growth chambers at Leeds. The active membership in the UK Society is currently about 130 people, from Government, Universities and Commercial groups. Membership has been affected greatly by government closing institutions down in the 1980's and 1990's. Commercial organizations now comprise a number of people from industry. Total number of institutions involved is now approximately 25 (about 10 universities).

Lynton Incoll suggested a joint meeting in early September, 2001, since early March is Easter in the UK, and there is competition for accommodation. He suggested meeting at the John Innes Institute in Norwich, which has good meeting facilities and is next to University of East Anglia. It has large CE facilities, about 750 employees and they have agreed to host the meeting. It also includes the Sainsbury laboratory, which has extensive ranges of glasshouses, a range of containment glasshouse and six sets of various CE facilities. Lynton then suggested a 3-day conference program, to be followed by a 1-4 day tour, depending upon cost and participation (see minutes for details). Lynton Incoll then regaled the members with a slide show of various facilities and institutions throughout the UK, to provide some background for the various tour options.

The proposal was strongly supported in discussion by the members. Ramesh Kanwar indicated that the experiment station directors would support one official from each station for the meeting. A motion to organizing a meeting in the UK in 2001 was passed unanimously. A straw poll of members present indicated that 25 people would go. A 2001 Conference Organizing Committee from the US and Canada was appointed to help Lynton Incoll and the UK committee to organize the 2001 Meeting at John Innes Institute, University of East Anglia, Norwich:

- John Lea-Cox (Chair) — NRSL Dept., University of Maryland, College Park
- Ray Wheeler — NASA, Kennedy Space Center, FL
- Arend-Jan Both, Agricultural Engineering Department, Cornell University
- Mark Romer — McGill University
- Donald Krizek — USDA, Beltsville Agricultural Research Center, MD

5. Information Exchange and Tours

The annual information exchange included 31 reports from 21 research and industry members (see attachments to the minutes), which prompted much discussion and interaction between the participants.

Tours afterwards to the greenhouses at Cornell included the controlled environment hydroponic lettuce greenhouses, the floriculture greenhouses and the hydroponic test bed facilities.

The next meeting will be held at Purdue University, West Lafayette, Indiana from 11-13th March, 2000.