

**NCR-101 Annual Meeting Minutes**  
**Purdue University**  
**Sunday 12<sup>th</sup> March, 2000**

**Attendance (in no particular order)**

Ray Wheeler, A.J. Both, John Lea-Cox, Erik Runkle, Ted Tibbitts, Jim Faust, Bruce Bugbee, Reg Quiring, Mark Romer, David Brault, Bruno Faucher, Jeff Pinkett, Meriam Karlsson, Royal Heins, Douglas A. Hopper, Lou Albright, Peter Ling, Roy E. Young, Murat Kacira, Yang Yang, Henry Imberti, Robert Pauls, Alex Turkewitsch, Chris Smith, Tim Mies, Juan Castillo, Weijia Zhou, Judith Thomas, Carole Saravitz, David Tremmel, Steve Klassen, Jonathan Frantz, Changhoo Chun, Rick Cordes, Chieri Kubota, Ramesh Kanwar, Peter Vanderveer, Dennis Greer, Wade L. Berry, David Bubbenheim, Marc van Iersel, Cary A. Mitchell, Jill Harris Hill, Hyeon-Hye Kim, Amy Enfield, Genhua Niu, Kimberly A. Williams, Corey Johnson, Charlie Barnes

**Executive Committee**

Dr. Ray Wheeler, Chair  
Dr. John Lea-Cox, Vice-chair  
Dr. A.J. Both, Secretary  
Mr. Mark Romer, Past-chair

**Welcome**

Dr. Ray Wheeler opened the meeting at 8:08 am on Sunday, March 12 in Room 202, Stewart Center on the Purdue University Campus. Dr. Wheeler welcomed the 49 participants who filled out the attendance sheet.

**Local Arrangements**

Dr. Cary Mitchell, Department of Horticulture at Purdue University and Chair of the local arrangement committee, informed us of the local arrangements during the meeting and introduced us to Penny Harner-White, who assisted with the local arrangement organization.

**Introduction of Participants**

One by one, all participants introduced themselves and their affiliation.

**2000 NCR-101 Business Meeting**

**1. Administrative Advisors Report (Dr. Ramesh Kanwar)**

Dr. Ramesh Kanwar (Administrative Advisor to the NCR-101) announced that during an upcoming USDA Advisors meeting on March 21, 2000, he would ask for official permission to convene the 2001 NCR-101 meeting in England. He expected to get approval for this request. He informed us that the midterm grade for the review of the NCR-101 activities was an A+. He also stated that copies of the Plant Growth Chamber Manual (a 1997 NCR-101 publication) were still available through Iowa State University (\$15 plus \$4.95 shipping and handling for single copies, mention Special Report 99):

Agricultural Information Services

304 Curtiss Hall

Iowa State University

Ames, Iowa 50011-1050

Phone: (515)-294-5616

Dr. Kanwar distributed three handouts of particular importance to the academic membership of NCR-101.

Handouts 1 and 2:

Federal Register of March 6, 2000: USDA Cooperative State Research, Education and Extension Service request for proposals: Initiative for future agriculture and food systems. The amount of available support through this RFP for fiscal year 2000 is approximately \$113,400,000 and the deadline for proposals is May 8, 2000. The program areas include: agricultural genomics, agricultural biotechnology, food safety and the role of nutrition in health, new uses for agricultural products, and natural resource management (including

precision agriculture). Dr. Kanwar noted that the key to a successful proposal would be the integration of teaching, research, and extension. In addition, this RFP is promoting multi-state proposals. However, funding for this RFP is could be eliminated pending decisions of the federal legislature.

### Handout 3:

FY 2001 USDA Cooperative State Research, Education and Extension Service Budget Proposal. This handout shows the difference between the President's budget and NASULGC's (National Association of State Universities and Land-Grant Colleges) budget compared to last year's appropriations. The President's proposed budget increased by 2.3% (to a total of \$972,395,000), while NASULGC's proposed budget increased by 15.3% (to a total of \$1,095,229,000).

## **2. Minutes of the 1999 NCR-101 Meeting at Cornell University in Ithaca, NY.**

Dr. John Lea-Cox summarized the minutes of last year's meeting in Ithaca. (Note: these [minutes](#) can be found on the NCR-101 Web site). No additions or corrections were suggested. Dr. Roy Young made a motion to approve the minutes. Dr. Ted Tibbitts seconded the motion and the minutes were accepted by general vote.

## **3. Report on the status of the NCR-101 Instrument Package**

Note: Dr. Bruce Bugbee and Mr. Steve Klassen, both of Utah State University, are currently responsible for maintenance and up-keep of the NCR-101 instrument package. Dr. Bugbee gave a brief history of the instrument package and the need for an independent calibration standard. Dr. Bugbee reported that the balance of the instrument package account as of March 1, 2000 was \$3,354 (including three payments pending at \$900 and projecting the purchase of a StellarNet spectrometer at \$2,950). He was wondering if last year's organizing committee from Cornell University (chaired by Dr. Bob Langhans) completed the meeting with a positive balance, which, in the past, had been customarily forwarded to the instrument package account.

The StellarNet spectrometer was not yet purchased and a brief description of the meter and its capabilities was presented. Representatives from Convion stated that they recently obtained such an instrument and they were overall satisfied with its performance. This meter reports measurements in relative numbers (0-100% and thus useful to compare ratios, e.g., UV and PAR) and has a range of 200-850 nm with a resolution of 0.7 nm. Possible problems with the meter are that its field of view is different from a competitor's model (LI-COR), it is not cosine corrected, the accompanying software may have some bugs, and the manual is not always clear. Dr. Roy Young pointed out that it was stipulated in the motion to purchase the instrument that it be evaluated during the 30-day trial period offered by the manufacturer, and asked what the plans were for having this done. The ensuing discussion concluded that Drs. Gerry Deitzer, Don Krizek, and John Sager might be willing to perform the evaluation. Dr. Peter Ling noted that the bending of the fiberoptic cable can influence the measurement.

Dr. Bruce Bugbee passed a sign-up sheet for use of the instrument package by NCR-101 members around. He noted that last year, the small instrument package (for simultaneous calibration of up to 8 quantum sensors) was under utilized. A discussion started about possible problems sending the instrument package across borders. If the package is mailed through UPS, they will do the brokering. Accompanying documents should state the contents are "used equipment" and "to be returned" for speedier release at the border.

A discussion ensued about the rental price of the instrument package (currently \$300 for either the full or the small instrument package). It used to be that experiment station directors would pay for the use of the instrument package, but more frequently members are paying for it out of their own project funds. However, there is a need to subsidize the instrument package for obvious reasons (it costs about \$3,000 annually). One thought was to ask all experiment station directors to pay an annual fee regardless of the local use of the package.

Mr. Mark Romer proposed, as a short-term goal, to list the content of the instrument packages on the NCR-101 Web site, including a description of the proper use of each instrument. As a long term goal, Mr. Romer proposed to list more reference material related to the instrument package on the NCR-101 Web site. Dr. Roy Young seconded Mr. Romer's motion and it was accepted by general vote.

Dr. David Tremmel was asked to post a frequently updated sign-up sheet for each instrument package on the Web site.

Dr. Roy Young proposed to change the price of the small instrument package to \$250 and the full package to \$350. His motion was seconded and accepted by general vote.

Dr. Bruce Bugbee reported on long term drift and cosine correction of various quantum sensors used under outdoor conditions. Over time, these sensors can show large differences (up to 10%) compared to the calibration standard. The use of pyranometers can result in even larger errors.

#### **4. NCR-101 Internet Web site:** <http://www.ncr101.duke.edu>

Dr. David Tremmel reported on activity at the Web site since the last meeting. Not many additions to the site were received from the membership. Mr. Mark Romer reiterated the purpose of the Web site by listing its goals: to become a more international group, to disseminate information, to provide specific information to our membership, and to have a mechanism for self-publication. A discussion ensued about who decides what to put on the Web site. Members of the current Web committee are Mr. Mark Romer, Dr. Peter Ling, Dr. David Tremmel, and Dr. John Lea-Cox. Dr. Ray Wheeler asked if the Web committee was authorized to add new items to the Web site. Dr. Roy Young posed that the executive committee (chairperson, vice-chair, and secretary) should be involved. Dr. Ted Tibbitts stated that some continuity was needed. Dr. Young proposed a motion to expand the Web committee to the current four members plus the Vice-chair person of the executive committee. The motion was seconded and approved by general vote. Dr. Tibbitts proposed that the Web committee should have a chairperson, but this motion was not voted on. The Web committee is authorized to make incidental additions/changes to the Web site. Adding new categories to the Web site should be decided at the annual meetings.

A discussion started about putting the Guidelines on the NCR-101 Web site. More discussion followed about the information listed on the Web site for each of the member stations. Each member was asked to review this information and to decide what information is appropriate to list on the Web site. Updates of member station information should be forwarded to Dr. David Tremmel ([david.tremmel@duke.edu](mailto:david.tremmel@duke.edu)). It was approved at last year's meeting, the annual station reports will be posted on the NCR-101 Web site. Each reporting member is asked to forward an electronic version of his or her report to Dr. David Tremmel.

#### **5. Membership List**

Mr. Mark Romer circulated the current membership list so attending members can update their information. Currently, NCR-101 has 131 members from 76 institutions, A total of 13 new members were added since the previous annual meeting. The 76 institutions include 11 phytotrons and controlled environment facilities, 39 university departments and experiment stations, 9 government organizations and contractors, and 17 industry representatives.

#### **6. Other Committee Reports/Old Business (Members)**

None.

#### **7. New Business (Members)**

A. Dr. Ted Tibbitts reported on the proposed submission of "Guidelines for Measuring and Reporting Environmental Parameters in Growth Chambers" to Biotronics. He asked for volunteers to review the draft article and about 10 members agreed. More volunteers were needed to review the additionally proposed "Guidelines on Plant Monitoring". About three members agreed to review the second article. Mr. Mark Romer asked if these proposed articles could also be published on the NCR-101 Web site.

B. The nominating committee (Dr. Judith Thomas, Mr. Mark Romer, and Dr. Ray Wheeler) nominated Dr. David Tremmel to be the incoming secretary. This motion was approved by general vote. Next year's executive committee will include Dr. John Lea-Cox, Chair, Dr. A.J. Both, Vice-chair, Dr. David Tremmel, Secretary, and Dr. Ray Wheeler, Past-chair.

C. Future Meetings

1. Dr. John Lea-Cox reported on the activities of the organizing committee for the joint CEUG (Controlled Environments Users Group, our British counterpart) and NCR-101 meeting in England on September 9-12, 2001 at the John Innes Centre in Norwich,

England. Dr. Lea-Cox distributed two handouts with a proposed agenda and tour schedule for the joint 2001 meeting. The proposed title for the joint meeting is "Controlled Environments in the New Millennium". The members of the US organizing committee are Dr. John Lea-Cox, Dr. Ray Wheeler, Dr. Don Krizek, Dr. A.J. Both, and Mr. Mark Romer. Our British counterparts under the leadership of Dr. Lynton Incoll ([l.d.incoll@leeds.ac.uk](mailto:l.d.incoll@leeds.ac.uk)) have contributed a significant amount of effort towards finalizing the meeting program. Dr. Lea-Cox distributed copies of the proposed program and tour. The meeting is scheduled to start on Sunday, September 9, 2001 with an early evening welcome reception. The following Monday morning is scheduled for a scientific session, followed by an afternoon tour of the facilities (John Innes Centre) and trade show display, and separate evening business meetings for CEUG, NCR-101, and ASHS EC Working Group. Tuesday, September 10, 2001 is filled with scientific sessions and information exchange, followed by a conference dinner in the evening. Wednesday, September 12, 2001 is scheduled for a final morning session and the conclusion of the meeting at lunchtime. From Wednesday afternoon through Friday, September 14, 2001 at lunchtime, an optional tour is planned with stops at the Institute of Arable Crop Research (Rothamsted Experiment Station, Harpenden), Zeneca Agrochemicals (Bracknell), Silsoe Research Institute (former National Institute of Agricultural Engineering), Botany Department at the University of Leicester, Horticultural Research International (Wellesbourne), and Centre for Population Biology (Imperial College at Silwood Park, Ascot; University of London). The proposed cost for the meeting is \$325, including room, meals and registration (September 9-12, 2001). The proposed cost for the tour is around \$300, including room, meals and transportation (September 12-14, 2001). Dr. Incoll indicated that with a reasonable number of people attending, these costs might come down. Both the CEUG and NCR-101 organizing committees have indicated they are soliciting sponsorship for this meeting to further reduce the overall cost for the individual participant. Funding to cover expenses for invited speakers and the possible meeting proceedings will have to be covered by sponsorship monies. About 30 NCR-101 members attending the Purdue meeting indicated they would be interested in travelling to England for the joint 2001 meeting. It was not clear how many spouses/significant others would be interested in traveling to England. It was decided to poll the NCR-101 membership by e-mail at a later date to investigate the interest. Discussion about the scientific part of the joint 2001 meeting focussed on the large number of proposed (invited) speakers. Concern was expressed that this would significantly reduce the time available for discussion/dialog/debate. It was suggested that the number of speakers should be reduced and instead of a formal presentation they should quickly (5-10 minutes) introduce the subject matter followed by enough time for open discussion. Meeting participants with relevant remarks/experiences/new evidence would also be encouraged to make short (5 minute) presentations. These short presentations could be solicited before the meeting to allow for proper time scheduling. Discussion about the proposed meeting topics (genetically modified organisms, technology of controlled environments, conservation and recycling, complex versus simple controlled environments, controlled environments in space, reporting guidelines, and new and innovative, ground breaking developments) showed there was a lot of interest in the first five topics (topic number two should perhaps be called "energy and controlled environments"). Dr. Royal Heins proposed a motion to let the organizing committee take the various viewpoints expressed during the discussion into consideration and proceed with the organization of the joint 2001 meeting. Dr. Ted Tibbitts seconded the motion and the motion was accepted by general vote.

2. Dr. Meriam Karlsson mentioned the 2002 ASHS meeting on August 11-17, 2002 in Toronto, Canada, which will be organized in conjunction with the 26th International Horticultural Congress.
3. The fourth International ISHS Symposium on Artificial Lighting (November 7-9, 2000) at Laval University, Quebec City, Canada was mentioned.

4. The site for the March, 2002 NCR-101 meeting was selected: jointly organized by North Carolina State University (Dr. Judith Thomas) and Duke University (Dr. David Tremmel) at Raleigh-Durham, North Carolina.
5. The 2001 and 2002 meetings will take place in the same fiscal year. Dr. Ramesh Kanwar offered to send a notice to all experiment station directors informing them of this fact and asking them to make allowances in their budgets to accommodate two NCR-101 meetings in one fiscal year.
6. Dr. David Bubbenheim motioned to not have the NCR-101 meetings on weekends. He indicated that a Saturday overnight stay is not always required for a cheaper airfare. The motion was amended to poll the attendees for their preference: 14 attendees did not want to change the current meeting days (Saturday through Tuesday), 8 attendees wanted to change the meeting days to weekdays only (and no travel on weekends), and 18 attendees did not have a preference either way. Therefore, there was not enough support to change the meeting days to weekdays only. Mr. Mark Romer stated that the organizer of the particular meeting should have the freedom to decide when to organize the meeting in order to economically schedule the various components.
7. Dr. David Bubbenheim asked if there was any interest from the NCR-101 members for the USDA Guidelines for Organic Registration, which are currently under review.
8. Dr. Ted Tibbitts reported that since publication, 666 copies of the Plant Growth Chamber Handbook have been sold, 38 of which last year, and 128 copies the year before. The ASHS is now willing to advertise the Handbook in their various publications. Hopefully, this will increase sales of the Handbook.

A motion was put forward to adjourn the 2000 NCR-101 Business Meeting. The motion was seconded and approved by general vote.

### **Information Exchange**

Dr. Dennis Greer gave a report about recent activities at the New Zealand National Climate Laboratory.

### **Station Reports**

The following attendees presented their station reports:

Dr. Lou Albright, Cornell University  
Dr. Royal Heins, Michigan State University  
Dr. Charlie Barns, NASA Headquarters  
Dr. Roy Young, Penn State University  
Dr. Douglas A. Hopper, Achieving Solutions  
Mr. Chris Smith, University of Saskatchewan Phytotron  
Mr. Tim Mies, University of Maryland  
Dr. John Lea-Cox, University of Maryland  
Mr. Juan Castillo, Lockheed Martin, NASA Johnson Space Center  
Mr. Mark Romer, McGill University Phytotron  
Mr. Reg Quiring, Conviron  
Mr. David Brault, Conviron  
Dr. Peter Ling, Ohio State University  
Dr. Weijia Zhou, University of Wisconsin, Madison  
Dr. David Tremmel, Duke University  
Dr. Ted Tibbitts, University of Wisconsin, Madison  
Dr. David Bubbenheim, NASA Ames Research Center  
Dr. Chieri Kubota, Chiba University, Japan  
Dr. Changhoo Chun, Chiba University, Japan  
Mr. Bruno Faucher, Agritechnove, Inc.

Mr. Peter Vanderveer, University of Wisconsin Biotron  
Dr. Bruce Bugbee, Utah State University  
Dr. A.J. Both, Rutgers University

The station reports were followed by Monday (March 13) afternoon tours of various research facilities (greenhouses and growth chambers) at the Purdue University Campus. On Tuesday morning, Dr. Alan Hammer of Purdue University organized a tour of three very different horticultural businesses. The first tour stop was at Heartland Growers in Westfield, IN. Inside the approximately 14 acres of greenhouses, bedding plants, geraniums, lilies, hanging baskets (flowering and foliage), hardy mums, poinsettias, and other assorted flowering crops are grown. The second tour stop was at the Engledow Group in Carmel, IN. The company provides specialized exterior and interior plants, flowers, and landscape programs for commercial businesses. The final tour stop was at Crossroads Greenhouse, adjacent to the Southside Landfill just South of Indianapolis, IN. This six-acre greenhouse facility produces flowering ornamentals for the wholesale market. Methane gas produced inside the landfill is used to heat the greenhouse.

Respectfully submitted,  
A.J. Both, NCR-101 Secretary