

Meeting Minutes
NCR-101 Committee on Controlled Environment Technology and Use
Tucson, Arizona March 12-15, 2005.

Attendance

George Adamson (Ontario Scientific), Lou Albright (Cornell University), Wade Berry (UCLA) & Betsy Berry, Conrad Bonsi (Tuskegee University), A.J. Both (Rutgers University), Amanda Broome (Texas Tech University), Bruce Bugbee (Utah State University), Roger Cohn (Environmental Growth Chambers), Joel Cuello (University of Arizona), Gerald Deitzer (University of Maryland), Richard Denis (Agritechnove Inc.) & Caroline Brault, Mike Dixon (University of Guelph), Tracy Dougher (Montana State University), Shaun Faulkner (University of Maryland), Priscilla Files (University of Arizona), David Fleisher (USDA), Jonathan Frantz (USDA-ARS), Gary Gardner (University of Minnesota), Gene Giacomelli (University of Arizona), Richard Giroux (Canadian Space Agency), Richard Gladon (Iowa State University) Bernie Grodzinski (University of Guelph), Alec Hay (Utah State University), Henry Imberti (Percival Scientific Inc.), Merle Jensen (University of Arizona), Ramesh Kanwar (Iowa State University), Meriam Karlsson (University of Alaska), Bruce Kettner (Enconair) & Fern Kettner, Hyeon Hye Kim (NASA Biological Sciences Office), Donald Krizek (USDA, ARS, ANRI, Sustainable Agr. Systems Lab) & Betty Krizek, Mark Kroggel (University of Arizona), Chieri Kubota (University of Arizona), Peter Ling (Ohio State University), Alec & Marlene Mackenzie (Argus Control Systems Ltd.), Gioia Massa (Purdue University), Richard McAvoy (University of Connecticut), Cary Mitchell (Purdue University), Robert C. Morrow (Orbital Technologies Corp.), Desmond Mortley (Tuskegee University), Bill Mukanik (Convion), Joey Norikane (University of Kentucky), Eiichi Ono (University of Arizona), Robert Pollock (Southern Sun BioSystems), Jessica Prenger (Dynamac Corporation), Sharon Reid (Convion), Westin Rink (Controlled Pharming Ventures, LLC), Mark Romer (McGill University Phytotron) & Bonnie Soutar, A.O. Rule (Environmental Growth Chambers), Phil Sadler (Sadler Machine Co.), John Sager (Kennedy Space Center), Carole Saravitz (North Carolina State University), Ursula Schuch (University of Arizona), Melissa Snider (U.S. Space and Rocket Center), Stan Starr (Dynamac Corporation), Gary Stutte (Kennedy Space Center), Mark Theroux (Enconair), Alex Turkewitsch (Greenhouse Engineering) & Eva Turkewitsch, Tom van der Walle (Rutgers), Marc van Iersel (University of Georgia), Ryan Warner (Michigan State University), Jeff Werner (University of Alaska), Ray Wheeler (Kennedy Space Center), Yang Yang (Purdue University), Neil Yorio (Dynamic Corporation).

Executive Committee

Chieri Kubota, Chair
Dave Fleisher, Vice Chair
Desmond Mortley, Secretary
Reg Quiring, Past Chair

General Announcements

Dr. Ray Wheeler (KSC) announced that the Habitation conference will be held in January, 2006 in Orlando FL and will include Advanced Life Support, Controlled Ecological Life Support Stems and Aerospace research.

ASHS Meeting Report

Dr. Tracy Dougher (University of Montana) gave a synopsis of the meeting which was held previously to the NCR-101 business meeting. Thirty people attended. ASHS sponsored prior events including an Ethylene Workshop (2001, 2002, and 2003; proceedings published in HortScience and Acta Horticulturae). A workshop on Medicinal Plants in Controlled Environments is planned for 2005, and a gas exchange colloquium in 2006. There will be a CSREES meeting to be held prior to the 2006 colloquium to discuss funding.

Administrative Advisor Report

Dr. Ramesh Kanwar (Iowa State University) continued to serve as administrative advisor to the NCR-101 committee. He provided a handout on NCRA regional updates. Pertinent information included new potential budgets that were proposed by the House of Representatives that called for a 2-stage elimination of formula funds (NCR would be affected should the budget pass). Dr. Kanwar recommended strong impact statements to be made in annual reports to emphasize what was done, why it was important, and what new outcomes or work is being done in the committees. For 2005, the NCR committee, which is a multi-state committee will receive a new name, either something like NCCC-xxxx (this format implies regional issue that is being discussed in a multi-state format) or NCERA-xxxx (this format implies work would be peer-reviewed). Either committee name will be required as part of an annual report (with minutes) 60 days from the end of the meeting.

Dr. A.J. Both (Rutgers University, NJ) asked why the new name would include 'NC' which implies North-Central region. Dr. Both wasn't sure this was valid since NCR-101 had expanded to include states throughout the country. Dr. Kanwar replied that this was perfectly acceptable as the committee fit within the 'NC' model. Dr. Donald Krizek (USDA-ARS, MD) stated the committee was originally established as NC due to the fact that 2 members in the NC region were founders of the original group.

Dr. Chieri Kubota (University of Arizona) asked whether the 101 portion would remain the same to which Dr. Kanwar was not sure yet.

Minutes from 2004 Meeting

Minutes were nominated for approval by Alex Turkewitsch (Greenhouse Engineering), Mark van Iersel (University of Georgia) 2nded the nomination, and all approved.

Membership Report (Mark Romer)

Mark reported that the committee turned 30 years old this year. It originally started as a 12 member committee and has been growing in diversity and size since. The committee had a net loss of two members over the past year (Appendix 1) and currently stands at 130 members. There are 94 institutions from 10 countries. New institutions from Australia, New Zealand, Canada, South Africa, the United Kingdom, and the United States were added to the group over the past year. Approximately 95% of all members attended the NCR-101 meetings every 3 to 5 years.

Member Awards

Mark Romer discussed awards to be given to members. In 2002, the committee established the "Founders Award" which was presented to Ted Tibbitts, Bob Langhans, Wade Berry, Art Spomer and Don Krizek. As well, the "Significant Contributor Award" was presented to Jack

Downs. This year, the “20 Year Member Award” was unveiled to honor long-standing members who have made a significant commitment and contribution to the group. The first candidates for this award were announced: Drs. John Sager (KSC), Cary Mitchell (Purdue University), and Richard Gladden (Iowa State). All three candidates joined in 1981, have served on the executive of the committee and have sponsored meetings in their home institutions.

A motion was also made to award the “Significant Contributor Award” to David Tremmel (Duke University). David has been a very active member of the committee since joining in 1995. He co-hosted the annual meeting in 2002, served on the executive, and was responsible for developing, launching and maintaining the NCR101 website. Donald Krizek (USDA-ARS) seconded the nomination, which was subsequently approved by all.

NCR101 Website

Dr. Tracy Dougher (Montana State) now hosts the NCR101 website. Links to all station reports were added and member pages were re-organized. The new Website address is <http://ncr101.montana.edu>

Mark Romer suggested that the website should maintain the NCR-101 name with a new note updating the new committee name once determined. Mark Romer reminded members that he was responsible for maintaining the membership database which included information listed on the website. Changes and updates should be sent to mark.romer@mcgill.ca

The 1994 conference proceedings from the international workshop on Lighting in Controlled Environments were placed electronically in web format so that all articles could be obtained via the following link: <http://www.biology.mcgill.ca/Phytotron/LightWkshp1994/index.htm>

Several members discussed the electronic format (such as adobe acrobat (pdf) files versus html) and appropriate citation format (web site or book) for the conference proceedings and suggested that page numbers along with full citations should be included in the downloadable articles.

Dr. Chieri Kubota described issues related to obtaining an electronic format of the Growth Chamber Handbook (available in limited editions from the Iowa State University extension distribution center) for placement on the NCR101 website. Dr. Dick Gladden offered to find the editor who may have an electronic copy. Dr. Ramesh Kanwar suggested scanning in each page electronically as an alternative.

Instrumentation Package Report

Dr. Bruce Bugbee (Utah State) presented the NCR-101 instrumentation account budget from March 2004 to 2005. Dr. Bugbee briefly discussed the history of the instruments that are available for rent to NCR-101 members. Different packages are available including quantum sensors, dataloggers, UV meters, and a spectral radiometer. Dr. Gary Deitzer (University of Maryland) asked about older instruments (such as net radiometers). Dr. Bugbee agreed that they were still available if requested.

Dr. Chieri Kubota (University of Arizona), Gary Gardner (University of Minnesota), John Sager (KSC) and Bruce Bugbee emphasized that the instrumentation package was a great function of the NCR-101 committee and helps to facilitate collaboration among different scientists. It was discussed that many scientists in other disciplines (such as biology) do not understand the need to quantify photosynthetically active radiation or the limitations of the sensors used to measure this factor. They also discussed some of the limitations of the sensors in very humid

environments and the importance of calibrating the devices in the same environment that they are to be used in.

Donald Krizek (USDA-ARS, MD) described some of the history of light measurements and argued for using more than 1 sensor in experiments.

Dr. Peter Ling (Ohio State University) asked whether plant temperature measurements should be included in the instrumentation package. Dr. Bruce Bugbee agreed to determine the interest in the NCR-101 committee in adding this capability to the instrument package.

USDA Impact Statement

An impact statement needs to be written every 5 years to renew the committee's mandate. Major impacts include frequency of meetings and membership, website and technical information obtained from committee activities, technology transfer, guidelines for measurements in controlled environments and other research news. The due date for this statement was not known. Drs. Dick Gladden, Ray Wheeler, Chieri Kubota, Dave Fleisher, and Desmond Mortley agreed to help write the statement. Dr. Dave Fleisher agreed to lead the effort. Chieri Kubota nominated Dave Fleisher's offer, Mark Romer seconded the nomination, and the committee agreed.

Minimum Guidelines

Dr. A.J. Both (Rutgers University) discussed the progress made with the development of the Minimum Guidelines for Measuring and Reporting Environmental Parameters for Experiments on Plants in Growth Rooms and Chambers. A large poster was developed by the International Committee for Controlled Environment Guidelines (one poster for each of the three participating sister organizations) and available for display at this and future scientific meetings. This poster would next be presented at the upcoming annual meeting of the ASHS (Las Vegas). A PDF version of the Minimum Guidelines brochure has been made available for downloading on the NCR-101 web site. Some limited quantities of hardcopies of the Minimum Guidelines brochure were still available. No PDF version of the large poster has been made available. Dr. Chieri Kubota reported that a sub-committee was working on a similar (minimum) guidelines document for tissue culture applications. She indicated that this sub-committee was making slow but steady progress, initially tackling lighting issues, and would report their progress at the 2006 annual meeting.

Growth Chamber Handbook

Dr. A.J. Both (Rutgers University) reported that the sub-committee charged with investigating the options for revising the Handbook had made little to no progress. Several of the original chapter authors had previously indicated a willingness to work on a revision of their chapter(s), but no formal process was started. It was suggested that 1) the revisions could be conducted online, expediting the process, or 2) the text of existing chapters could be posted online allowing others to provide feedback/comments (e.g., through an on-line forum) that would be useful for the revision process of the entire Handbook (probably chapter by chapter). The general consensus at the meeting was that option 2) was the preferred option and that the text of the existing chapters should first be made available on-line on the NCR-101 web site. Dr. Chieri Kubota offered to work on scanning the Handbook.

Brisbane Funding.

Dr. Chieri Kubota announced that approximately \$250 was left from travel funds that supported members for last year's 2004 meeting in Brisbane, Australia. A suggestion was made to use this fund for hiring students to scan the pages of the Environmental Growth Chamber Handbook.

New Business

Incoming Secretary

The Executive Committee selected Dr. Erik Runkle (Michigan State) as the incoming secretary. Dr. Bruce Bugbee moved the nomination, which was seconded by Dr. Ray Wheeler and agreed on by all.

Meeting Dates and Location

2006 Meeting: Dr. Dick Gladden moved, Don Krizek seconded the motion, and the membership agreed unanimously that the 2006 meetings would be hosted by Ohio State University (Dr. Peter Ling) jointly with EGC (A.O. Rule). Tentative meeting dates were either the second week of March or the first week of April.

2007 Meeting: There was considerable discussion on this issue. It was originally thought that this meeting would be international and held at Kennedy Space Center, Florida. However, it was suggested that the interval between international meetings was too short (previous international meeting was Brisbane, Australia in 2004), and that location should be domestic. The motion to designate the 2007 meeting in the US was moved by Dick Gladden, seconded by Tracy Dougher, and agreed on by the membership.

International Meeting

It was suggested that the group consider convening the international meeting in either 2008 or 2009 in the U.S. or Canada. The convenor of the UK group, Dr. Lynton Incoll, had indicated that McGill University (Montreal) might be a good choice since it would be cheaper for U.K. colleagues to access. Further, since most UK members would want to come to Florida and if the '07 meetings would not be international, then it was suggested that KSC should be bypassed for a future date. It was concluded that the group should communicate this information to the U.K group (Lynton Incoll) so that he could report to them at their annual meeting in September, 2005.

Adjournment

Gary Gardener moved and Don Krizek seconded the motion to adjourn the 2005 meetings at 12:10 pm MT.

Appendix 1

NCR101 Membership Summary March 2005

Mark Romer, *List Curator*

Membership NumberApril 2004.....132
2005.....130

- Additions3
- Deletions5
- Net Gain(Loss)..... (2)

Membership Composition

Institutions

Members

- Phytotrons & Controlled Environment Facilities1216
- University Departments, Agr. Exp. Stations4461
- Government Organizations & Contractors1720
- Industry Representatives2130
- Independent3

Total Number of Institutions94

Total Number of Members130

New Institutions

Australia & New Zealand

- Australasian Controlled Environment Working Group
- Lincoln University Biotron, New Zealand

Canada

- Canadian Space Agency, Space Science Department
- Argus Control Systems Limited

South Africa

- University of KwaZulu Natal, School of Bioresources Engineering

United Kingdom

- Gallenkamp Environmental Simulation Ltd.

USA

- Rutgers University Ecocomplex