Content and Format for NCERA-101 Station Reports
(revised 2013)

All members are requested to prepare a 1-3 page station report that summarizes the past year's activities (regardless of whether you will participate in the annual meeting or not). Reports will be posted on the NCERA-101 website and provide information to the entire membership about your activities. Our secretary will also consolidate the group's accomplishments and impacts and submit a single report that is posted on the USDA's National Information and Management and Support System (NIMSS). The Executive Committee thanks you in advance for following the guidelines below.

Please submit your report by mid-March annually to both the secretary and webmaster in the following formats :

[1] to the current Secretary as an **MS Word document.**
[2] Carole Saravitz, Webmaster, carole@ncsu.edu in **Adobe PDF format.**

Content for NCERA-101 Station Reports

1. **New Facilities and Equipment.** Include sensors, instruments, and control systems purchased/installed.

2. **Unique Plant Responses**. Include noteworthy findings in controlled environment research.

3. **Accomplishment Summaries**. Draft one to three short paragraphs (2 to 5 sentences each) that summarize research or outreach accomplishments that relate to the NCERA-101 objectives (see below). Please use language that the general public can readily comprehend.

4. **Impact Statements**. Please draft 2 or 3 impact statement summaries related to the NCERA-101 objectives (listed below). Statements should be quantitative when possible and be oriented towards the general public. This is perhaps the most difficult yet most important part of the report. Two examples are listed below. Limited to 500 characters per impact statement.

5. **Published Written Works**. Include scientific publications, trade magazine articles, books, posters, websites developed, and any other relevant printed works produced. Please use the formatting in the examples below.

6. **Other relevant activities or information.**

NCERA-101 Objectives:

The overall goal of the committee is to develop or improve the theory and practice of controlled environment technology with particular reference to problems important to the North Central Region. As a non-funded committee, the objectives of NCERA-101 are based on communication and coordination. The committee will foster a range of cooperative efforts especially in the following specific areas:

1) Technology Advancement: Advance the technology of controlled environments and greenhouses for agricultural research and production.

2) Technology Transfer: Disseminate novel technologies to users including controlled environment manufacturers, managers, and commercial users; teach historical and recent controlled environment technologies to students.

3) Quality Control and Standards: Develop quality assurance procedures for environmental control and monitoring in research and production facilities to improve reproducibility of biological results.

4) Guidelines: Continue to develop and update guidelines for measuring and reporting environmental parameters for studies in controlled environments.

5) Communication: Publish research, exchange information, prepare educational materials, organize national and international symposia and conferences, and provide consultation and expertise for both scientists and commercial users of controlled environment facilities both domestically and abroad to research and industry stakeholders. The NCERA-101 committee developed a website (www.controlledenvironments.org) to facilitate outreach activities.

6) Instrument Calibration: Maintain a calibrated set of environmental measurement instruments that are available for use by researchers and commercial members.

7) Environmental: To promote the sustainable development and energy efficient operation of controlled environment facilities.

Examples of Accomplishments

Purdue University grew five day-neutral or everbearing cultivars of strawberry plants with three different day/night temperature regimes in growth chambers or in a greenhouse. Chamber plants were hand pollinated, while greenhouse plants were pollinated by hand or by vibrating wand. The coolest temperatures (18 C days/10 C nights) produced more berries with better flavor. No effect of pollination method was found, possibly due to heavier insect loads on plants pollinated more intensively.

Rutgers University quantified the impact of a manually operated energy curtain on the recorded inside soil and air temperatures and daily light integrals during early season high tunnel production of tomato. Data collected from late March through mid-May for two New Jersey locations and two growing seasons revealed that the use of an energy curtain inside a high tunnel increased the inside nighttime air temperature on average by 1.4 °C (or 13%) compared to a tunnel without a curtain. The use of an energy curtain inside a high tunnel increased the inside nighttime soil temperature on average by 0.5°C (or 4%) compared to a tunnel without a curtain but also decreased the accumulated inside light by approximately 5%.

Examples of Impact Statements

Lighting and temperature studies at Michigan State University have quantified the effects of growing bedding plants under different greenhouse conditions. As a result, flowering time and plant quality can be more accurately predicted by commercial greenhouse growers to meet their scheduled market dates. This information can be incorporated with energy consumption models to predict the amount of energy consumed when crops are grown at different temperatures. Growers who optimize temperature and light can potentially reduce their energy consumption by up to 30%.

The availability of water for agricultural use is under pressure, and more efficient use of the available water is increasingly important. Research at the University of Georgia has shown that efficiency can be increased by applying water based on the actual needs of the crops. This can be done using automated irrigation controllers that maintain substrate water content at a grower-determined level. Research indicates that a substrate water content of 15% (v/v) is adequate for most crops. Using automated controllers to maintain this substrate water level may reduce water use by 40% to 70%.

Format for Published Works (arrange alphabetically)

Books

Hartmann, H.T., D.E. Kester, F.T. Davies, Jr. and R.L. Geneve. 2002. Hartmann and Kester's Plant Propagation: Principles and Practices. Seventh Edition. Prentice-Hall, Inc., Englewood Cliffs, NJ.

Book Chapters

Gent, M.P.N. and R.J. McAvoy. 2000. Plant growth retardants in ornamental horticulture. In: Plant Growth Regulators in Agriculture and Horticulture: Their Role and Commercial Uses. A.S. Basra, (ed.) Good Products Press, NY. pp. 89-146.

Refereed Journal Articles

Shimizu, H., E.S. Runkle, and R.D. Heins. 2004. A steady-state model for prediction of poinsettia plant shoot-tip temperature. J. Amer. Soc. Hort. Sci. 129:303-312.

Symposium Proceedings

Fleisher, D.H., H. Baruh and K.C. Ting. 2001. Model-based predictive control for biomass production in advanced life support. Proceedings of the 2nd IFAC-CIGR Workshop on Intelligent Control for Agricultural Applications, Bali, Indonesia. August 22-24. pp. 198-203.

Poster Presentations

Padhye, S., E.S. Runkle, and A.C. Cameron. 2005. Quantifying the vernalization response of Dianthus gratianopolitanus 'Bath's Pink'. HortScience 40:1013 (poster presentation).

Popular Articles

Albright, L.D., R.S. Gates, K.G. Arvanitis and A. E. Drysdale. 2001. Control strategies for plant shoot and root environments on Earth and in space. IEEE Control Systems Magazine: Agriculture and the Environment 21(5):28-47.

Fausey, B., E. Runkle, A.C. Cameron, R.D. Heins, W.H. Carlson. 2001. Herbaceous perennials: Heuchera. Greenhouse Grower 19(6):50-62.

Other Creative Works

Donnell, M. and T.H. Short. 2001. An interactive economic analysis and business plan for hydroponic lettuce production. Program was developed on an OSUE hydroponics homepage site.

Prenger J. and P.P. Ling. 2001. Greenhouse condensation control – understanding and using vapor pressure deficit (VPD). Ohio State University Extension Fact Sheet, AEX-804-2001. The Ohio State University, Columbus, OH 43210.