

CCEA Newsletter

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CCEA is a research organization dedicated to the improvement and vitality of the Controlled Environment Agriculture Industry. CCEA is funded by Industrial and Grower Partners who contribute a yearly partnership fee. Satellite partnership is available to growers for a modest fee. Information on CCEA is available from:

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Vision Statement

CCEA, The Center for Controlled Environment Agriculture of NJAES of Rutgers University, a partnership among growers, industry and researchers, will devote itself to research and transferring information required for an economically viable and environmentally aware controlled environment agriculture industry. We will particularly strive to identify future trends, critical issues, appropriate emerging technologies and provide leadership for opportunities which challenge world-wide controlled environment agriculture in the 21st century.

Is it Sunset for the Greenhouse Industry?

William J. Roberts Director CCEA

My granddaughter is learning in school about the greenhouse effect. She knows that her grandpa is a greenhouse designer. Everything she learns about the greenhouse effect is negative and harmful to society. Why is my grandpa involved in something which is bad for society and bad for me? How can I answer her?

There is no quarrel with the concept of global warming and its deleterious effect on our society. The problem is that someone has coined the phrase greenhouse effect to describe global warming and my personal opinion is that it is potentially harmful to the controlled environment agriculture industry. Can someone come up with a phrase which will continue to keep the concept and problems caused by global warming in the forefront but not have it so closely linked with the controlled environment agriculture industry. Which industry, by the way is exploding in areas such as the People's Republic of China. Dr

Sase from Japan recently sent me data which indicates that there are 633,700 hectares of wood and or pipe structured greenhouses in the PROC and it is growing continually. There are 7000 ha of steel frame structured greenhouses. This is more than in the United States.

If you have any ideas for a good phrase let me know. If I am off-the-wall let me know that too. If you have an editorial to present to our partners and CCEA Scientific Advisors please let me know and we will consider it for a subsequent newsletter!!



Recent Publications of CCEA Faculty

Several of the Faculty have published recently in several areas of Controlled Environment Agriculture. Abstracts and summaries of these articles are included here. Single copies of each article are available from your Editor.

Simulation Analysis of Solar Sterilization Systems

Tadashi Takakura, Stephen Kania and W.J. Roberts

ABSTRACT:

A two-dimensional simulation model of a greenhouse-type solar sterilization system, which consists of a small tunnel with mulching, has been developed. Several parameters in the model were adjusted through model verification with experimental data. The model was then used to analyze effects of thermal properties on temperature increases at various soil depths. Higher emissivities or absorptivities of both tunnel and mulch films can result in higher soil temperatures. Absorptivity of the soil has a positive effect on maximum and a negative effect on minimum soil temperatures. Drier soil achieves higher maximum temperatures and lower minimum temperatures. Degree-hours above a particular temperature which kills soil-borne pathogens can easily be calculated by the model.

Proceedings 27th National Agricultural Plastics Congress, Tucson Arizona, Feb. 18-21, 1998

Soil Solarization to Eliminate Diseases from Greenhouses

W.L. Kline, W.J. Roberts, S. Kania, S. Johnston

ABSTRACT:

Greenhouse solarization was evaluated as a method to control soil borne diseases. A heated greenhouse with infrared 6 mil plastic on the soil surface or clear 4 mil plastic on the soil surface was compared to an unheated greenhouse covered with infrared 6 mil plastic plus clear 4 mil plastic on the soil surface or black 6 mil plastic on the soil surface and a clear 4 mil plastic tent stretched above the black plastic. Maximum soil temperatures reached in the heated greenhouse were 156-159 °F (63-64.5°C) for both plastic treatments at the 1 inch (2.54 cm) and 4 in (10 cm) depths. At 12 in

(30cm), temperatures were 145-146°F (57.3-58°C). Soil temperatures in the unheated greenhouse varied between 142-145°F (56-57.5°C) at 1 inch (2.54 cm), 130-135°F (50-52.5°C) at 4 inch (10cm) and 108-112°F (39-41°C) at 12 inch (30cm). Soil samples were collected at each depth and the soil tested for *Rhizoctonia solani*. *Rhizoctonia solani* colonized beet seeds 11-85% in the control houses followed by unheated clear 2-10%, unheated black plus clear 1-6%, heated clear 0-0.5% and heated infrared 0%.

Proceedings 27th National Agricultural Plastics Congress, Tucson Arizona, Feb 18-21, 1998

From Greenhouse to CEPPS to Phytomation

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ABSTRACT

In the past thirty plus years, the bioresource engineers at Rutgers University have worked, with their colleagues in plant science, biotechnology, agricultural economics, food science, nutrition, and environmental science, progressively on plant based engineering systems within controlled environments. The topics of study may be appropriately described as evolving from greenhouses to controlled environment plant production systems (CEPPS), and to phytomation. In the greenhouses and CEPPS, plants are produced to directly meet market needs. In a phytomation system, the plants may assume other roles such as treating contaminated water in a phytoremediation system, and reducing carbon-dioxide, supplying oxygen, and provide clean water in a bioregenerative life support system (BLSS) for space exploration.

*Proceedings of International Conference on
Agricultural and Biological Environment (ICABE)
Beijing People's Republic of China
August 15-19, 1996.*

Sustaining Human Lives in Outer Space

KC Ting, Peter P.Ling and Gene A. Giacomelli
Printed in ASAE RESOURCE, Magazine,
March 1997.