

NYSERDA'S 7th Annual

Innovations Agriculture Conference











Innovations in Agriculture Conference

April 16-18, 2007

Controlled Environment Agriculture (CEA)



Dr. Louis D. Albright, Professor, Biological and Environmental Engineering and Director of the Cornell CEA Program

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Dr. Louis D. Albright is a professor of Biological and Environmental Engineering at Cornell and director of the Cornell CEA Program. Dr. Albright's specific interests are environmental control and energy management in CEA facilities, and sustainable, environmentally controlled, agricultural production systems in general.



Linda Clark, Senior Economic Development Representative National Grid Economic Development, A-2

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Linda Clark is an Economic Developer with National Grid and is located in the Syracuse, NY office. Ms. Clark works in collaboration with economic development agencies and communities to support the attraction of capital investment and jobs to Upstate New York. National Grid has continued and enhanced economic development programs in upstate New York since 1924. Her educational background includes completion of graduate work at Syracuse University and a Bachelor of Science in Education from SUNY Oswego. She has a permanent certification in teaching from the state of New York.



Joseph Heller, Project Coordinator, USDA, NRCS RC&D

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Joseph Heller is the Resource

Conservation and Development (RC&D) Coordinator for United States Department of Agriculture covering The Hudson River Valley, New York City and Long Island in New York. Joe has been on the advisory board of the NYC Wholesale Farmers' Market Study since its formation in 2001. As coordinator of the Lower Hudson – Long Island RC&D Council Joe has assisted farmers with marketing efforts in a variety of ways such as setting up three regional farmers markets. Currently Joe is assisting farmers with identifying ways to enter the alternative energy market through biomass production and pelletizing grasses for thermal heating systems in pellet stoves and industrial furnaces.

Biographies



John Nettleton, Sr. Extension Associate, New York City Extension, Cornell

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John Nettleton develops innovative education programs at Cornell University Cooperative Extension/ NYC and is now focused on two initiatives: biofuel

development in New York State; and MarketMaker, a web-based platform linking actors throughout the value-added food chain. He has served on Boards of Greyston Family Inn (Yonkers), Cornell's Community & Rural Development Institute (CaRDI), NJ Higher Education Partnership for Sustainability (NJHEPS) and is current President of the Assoc. of Energy Engineers- NY.



John Hoogeboom, Rough Bros. Greenhouses

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John Hoogeboom has been involved in the greenhouse industry since 1972 and was employed by some of the leading support companies in the global greenhouse industry, including:

Glasshouse Automation, Ltd. of England – General Manager Van Vliet Pijnacker, B.V. of the Netherlands – Export Manager Van Wingerden Greenhouse Co. of the USA. – General Manager

In 1995 John started Agronomico International, Inc. to provide greenhouse operators with consultancy services relating to the design, construction and operation of state-of-the-art greenhouse facilities for the production of vegetables and (cut) flowers. In 2003 John joined Cincinnati based greenhouse manufacturing company Rough Brothers, Inc. as a greenhouse project development engineer, responsible for designing medium and large scale vegetable production facilities, both for US and overseas customers.





Kristen Park Extension Support Specialist III Applied Economics and Management 109 Warren Hall

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Kristen Park is an Extension Associate in the Food Industry Management Program.

She conducts research on a variety of food marketing issues, with special research interests in the fresh produce distribution system and consumer trends in retail.

Biographies



Dr. Robert Gravani, Professor, Food Science, Cornell University

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Dr. Gravani is a Professor of Food Science at Cornell University. He received his B.S. degree in Food Science from Rutgers University and his M.S. and

Ph.D. degrees from Cornell University. He joined the faculty at Cornell in 1978, after serving as Assistant Director of the Institute of Food Science and Marketing at Cornell and Science Director of the Cereal Institute, Inc.





Edward D. Harwood, PhD., GreatVeggies, LLC

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GreatVeggies®, LLC is in the business of designing, merchandising and utilizing proprietary technologies to grow interesting salads in a controlled environment.

Our patent pending aeroponic process allows us to grow locally all year long, without pesticides, without washing, and with far less labor. Our process is capable of full automation, does not require a greenhouse, and conserves water.





James Prevor Perishable Pundit

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James E. Prevor is widely recognized as a leader in understanding and assessing the state of the perishable food industries. The founder and editor-in-chief of both

PRODUCE BUSINESS and DELI BUSINESS magazines, he spearheaded the repositioning of AMERICAN FOOD AND AG EXPORTER magazine and FOOD DISTRIBUTION MAGAZINE and launched The Retail Institute, The International Prepared Foods Conference and Exposition. He was a founding partner in the launch of both the Institute for Produce Entrepreneurs, designed to help family businesses, and Perishable Solutions, a consultancy specializing in bringing strategic thinking to the fast-moving business of perishables.



Michael S. Hall, CEA Systems

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Michael Hall is a founding member and Vice-President of PFA Consulting, a firm responsible for designing and delivering a wide range of leadership and organizational development programs for private and

public clients. Representative client services include mediation, large group facilitation and employee coaching. Mr. Hall established CEA Systems in 2000. CEA Systems is the exclusive licensee in a joint venture with the Cornell Center for Technology, Enterprise and Commercialization to develop and commercially deploy intellectual property in the field of controlled environment agriculture.





James Jacob Empire State Development

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Jim Jacob is a Director of Industry Development with Empire State Development's Strategic Business Division in Albany. Mr. Jacob's industry

cluster assignments include the forest products and agribusiness industries. He's involved in the development, administration, and site selection process for the Build Now – NY and Shovel Ready Initiatives. Jim is also the administrator for the web based NYSiteFinder property database management and GIS system.



Keith Frosceno, Sr. Produce Category Manager, Golub Corporation

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Keith Frosceno is Senior Produce Category Manager for Price Chopper Supermarkets since July 2006. Prior to joining Price Chopper, he has held positions of Vice president, Sales at W. Newell Co. a produce subsidiary of SUPERVALU. He was also Vice President of Produce and Floral at Bozzuto's Inc. in Connecticut. Mr. Frosceno has a B.A. in Economics from Central Connecticut State College.





Robert LaDue Manager, Finger Lakes Fresh 10 Pinckney Road

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Bob LaDue is currently Manager of Finger Lakes Fresh, a division of

Challenge Industries, Inc., Ithaca, NY. Finger Lakes Fresh produces several varieties of lettuce crops in a CEA greenhouse. Bob also managed the same facility when it was the Cornell CEA Greenhouse. Prior to that, Bob was a Partner/Consultant for B&B Aquaculture, Stratham, NH. He was also manager of the Cornell Aquaculture Facility in Hartford, NY. Bob holds a BS degree from Cornell University





Dr. Merle Jensen Professor Emeritus, Arizona State University

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Merle Jensen has devoted his career to controlled environment agriculture, designing intensive food production

systems ranging in application from Spaceship Earth to Planet Mars. He has personally traveled to over 60 countries demonstrating the application of technologies that he and his colleagues researched and developed at The University of Arizona. While retired from the College of Agriculture and Life Sciences at The University of Arizona, he has returned part-time, continuing in the capacity of Assistant Dean for Sponsored Research and Associate Director of the Agricultural Experiment Station. He is Professor Emeritus of Plant Science.





Mike Porter NEXUS Corporation

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Michael R. Porter has been President of Nexus Corporation since 1994. Nexus, headquartered in Northglenn, Colorado, is one of the largest North American

manufacturers of greenhouse structures for use as research facilities, garden centers, growing ranges, and residential hobby greenhouses. Nexus and its subsidiary National Greenhouse have been manufacturing greenhouse structures for over 70 years, and currently have manufacturing facilities in Colorado; Pana, Illinois; and Darlington, South Carolina. Mr. Porter has Industrial Engineering degrees from Cornell University, and lived in Ithaca for 20 years.



Richard Peterson President

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Richard Peterson is President of Northeast

Agriculture Technology Corp., a consulting company focused on agricultural energy applications, alternative energy systems, and technology applications for agriculture. He worked for 33 years at New York State Electric and Gas Corp as an agricultural engineer in Electric marketing and as Manager, Agricultural Energy Services. He is an agricultural engineering graduate of Cornell University. He has supported research and development activities for the CEA industry in New York for more than 20 years.



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Stephen McGrattan

Agriculture Business Development Specialist NYS Department of Agriculture and Markets

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Stephen McGrattan is an Agricultural Business Development Specialist with the New York State Department of Agriculture and Markets. Mr. McGrattan came to the Department in July 2004, with over 15 years in local and state government experience, to provide technical assistance to agricultural businesses in accessing public and private funding to assist in financing their business plans. He also manages three of the grant programs under the GROW NY Program, as well as manages the Agricultural Ombudsman Services Program which seeks to facilitate communication and improve the working relationship between the agricultural/food-processing industries and environmental and other regulatory agencies.





Frank Roma Lead Engineer NYSEG

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Frank P. Roma, P.E. is a graduate of Broome Community College and of

Clarkson University (BS Chemical Engineering). He is employed by NYSEG and was responsible for the water chemistry related to power plant boiler cycle chemistry and environmental compliance. Mr. Roma evaluated storage tanks under the Chemical and Petroleum Bulk Storage Tank Laws. He is now Lead Engineer in the Marketing and Sales Department working with customers on incentives, curtailment and hourly pricing. Mr. Roma is a Professional Engineer in New York.

Biographies

William Reinhardt

Senior Project Manager, New York State Energy Research Development Authority (NYSERDA)

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Responsibilities include development and management of industrial energy research projects, with a focus on demonstration projects designed to enhance process energy efficiency of New York Industry. Included are industrial energy product development, manufacturing electrotechnologies and electricity demand load shaping, controlled environment agriculture, and hydrogen technology development. In addition, Bill has developed an extensive understanding of the issues surrounding the debate about global oil depletion and has given numerous presentations on the issues and how oil depletion would impact New York State industry, including agriculture.





A. Edward Staehr Communications Director NY FarmNet 415 Warren Hall

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Ed Staehr is an Extension Associate in the Department of Applied Economics and

Management at Cornell University, where he is part of the leadership team for the NY FarmNet and NY FarmLink programs. Among Ed's professional interests are integrating production economics and environmental issues. He coauthored *Environmental Factors When Expanding Dairies*, and provides leadership on agricultural business planning efforts in New York State. Staehr's work often involves collaboration with other organizations, and he is presently working with the Waste Management Institute at Cornell to quantify production costs of converting manure solids to bedding.



Wayne and Phyllis Underwood Underwood's Shushan Valley Hydro Farm

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Wayne has been a dairy farmer for 10 years, and an excavation contractor the last 15 years. During the last 10 years

totally constructed 2 - 2 bay gutter connect hydroponic tomato greenhouses, and last year built a 30 x 100 hydroponic basil greenhouse. He takes care of all operations and nutrient

management, using CEA practices for all 10 years and is a CEA Advisory Board member at Cornell.

Phyllis has also been a dairy farmer for 10 years, as well as a management consultant, manager of sales and marketing, and office and personnel manager for hydroponic operations for the last 10 years. She has a BA in Business Administration from Skidmore College and is a member of the CEA Advisory Board at Cornell.







James Stapleton Principal Energy Manager National Grid 300 Erie Blvd. West Syracuse, NY 13202

Jim Stapleton is Principal Energy Manager for National Grid. He has been employed at National Grid for 22 years and has 20 years experience in energy management and power quality. He is a Certified Energy Manager and a Certified Power Quality Professional. He has a B. S. degree in Engineering from Virginia Tech and an M.B.A. from LeMoyne College.







Commissioner Patrick M. Hooker New York State Department of Agriculture and Markets

Prior to his appointment, Commissioner Patrick M. Hooker served as the Director of Public Policy at the New York Farm Bureau, a position he had held since 1999. Pat was the Deputy Director of Governmental Relations at the New York Farm Bureau from 1990 to 1999. From 1987 to 1990, he served as Director of the New York Senate Agriculture Committee. He was also a Rural Affairs Advisor to the New York State Assembly in the Office of the Minority Leader from 1985 to 1987. Pat received his B.S. from Cornell University in Agricultural Education and his A.A.S. from the State University of New York at Morrisville in Agricultural Science. While at Cornell, he was initiated into Alpha Gamma Rho, the national agriculture fraternity.



Development Author

The NYSERDA 2020 Vision for Controlled Environment Agriculture

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in New York State

New York State's production of fresh vegetables and fruits in controlled environment agriculture (CEA) facilities is likely to grow explosively over the next decade. This surge will stem from water quality and other problems resulting in field-crop contamination sources in major vegetable growing states. These health and safety concerns combined with rising energy and fertilizer costs will

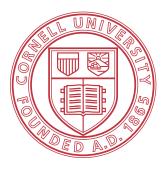
position the Empire State to resume a larger food production role. CEA crops will have consistently high quality, will be available "out-of-season", and will be grown with little or no pesticide. Currently, the "out-of-season" fresh vegetable markets (e.g. lettuce, tomatoes, spinach and green peppers) are dominated by southern and western United States growers and foreign producers.

The development of a vibrant New York CEA industry will provide a major economic boost to the State's agricultural sector. In 2020 these impacts will include:

- 1,000–1,500 acres of greenhouses
- 10,000–15,000 jobs (10 jobs/acre)
- \$400–600 million annual sales (\$40,000 sales/job)

Beyond these economic impacts there are several additional benefits and likely outcomes from the strong CEA industry:

- By 2020 New York is likely to be recognized as the leader of the CEA industry in the Northeast, where CEA is an established and growing industry.
- As a result of a coordinated and integrated statewide effort, CEA facilities and products are available across the State in both rural and urban settings.
- Locally grown CEA fruits and vegetables are both publicly accepted and expected in grocery stores, restaurants and public markets because of their quality, safety, cost competitiveness and availability in New York State.
- The establishment of a strong CEA industry has created a stable, community-based agricultural workforce that is well-integrated into the local community.
- Due to progressive State policies and tax incentives, CEA facilities are developed atop capped Brownfield sites and support sustainable, green urban development.
- At the State and Federal levels, energy policies to encourage energy efficiency and renewable energy development support the development of energy-efficient CEA projects that manage electrical loads in order to minimize peak demand and use indigenous energy resources such as stranded natural gas, off-grid wind, biomass, landfill and biogas to provide combined heat and power.
- In New York State, the combination of energy efficiency, decentralized power generation and supportive net-metering policies, has CEA systems tied into and supporting the electric grid wherever possible. These sites use off-peak utility resources, to minimize utility system use during peak demands thereby boosting utility system reliability for all consumers.
- By 2020, New York has established a world-class regional network of CEA Academic programs to lead the way in the development of new CEA technology, technology transfer and workforce training.
- New York's favorable business and regulatory climate has attracted many new jobs and high-tech agricultural industries, and its competitive advantages in R&D, market pull, and access to financial markets have all contributed to its success.
- Building on its base of fruit and vegetable production, the CEA industry in New York has diversified into such areas of research, development, and commercialization as nutriceuticals and pharmaceuticals derived from CEA.



Cornell University

Controlled Environment Agriculture in New York State

The Vision:

We envision that by the year 2020 a vigorous Controlled Environment Agriculture industry will emerge in New York State to advance plant-based agriculture in ways that greatly reduce dependence on imported horticultural crops and valuable phytochemicals while enhancing environmental quality, food safety and food security; reducing dependence on non-renewable energy resources; and providing year-round and rewarding opportunities for employees.

The Mechanism:

Our proposed mechanism to achieve the vision is to establish a CEA institute of excellence located at Cornell University, with links to other colleges and universities, existing and potential commercial and industrial collaborators and CEA technology users, Cooperative Extension educators, The Cornell Sun Grant Institute of Excellence, and state-wide agricultural organizations, as a minimum. The proposed institute is to

- grounded, reflecting reasonable and practical visions for the future;
- focused, through development of blueprints to achieve the visions;
- viable, by engaging appropriate communities and organizations within the State;
- visible, by preparing and publishing timely information through a variety of venues;
- pro-active in promoting its information and technologies within the greenhouse industry.

The Structure:

The proposed institute will be comprised of three elements: research, technology transfer, and education and training. It will be under the direction of a tenure-line faculty member from Cornell and will include staff as appropriate. Examples of staff include Research Associates, Research Support Specialists, and Graduate Assistants. Various faculty members at Cornell as well as other educational and research institutions within the state will be included as participating members of the institute, drawing upon their expertise as appropriate. Examples of appropriate expertise include horticulture, engineering, economics, entomology, food science, plant pathology, microbiology, communication, plant sciences, and education.





The New York State Department of Agriculture and Markets Controlled Environment Agriculture Mission Statement

The mission of the New York State Department of Agriculture and Markets is to assist in developing Controlled Environment Agriculture as an economical and environmental option for sustainable agriculture by fostering a competitive food and agriculture industry for the benefit of producers and consumers.







New York Farm Bureau CEA Vision Statement

As the largest general farm organization in the state, New York Farm Bureau believes that dialogue exploring new, innovative technologies is an important step in allowing farms to meet changing market demand and maintain individual farm competitiveness. We recognize and appreciate the

commitment of all CEA conference attendees in adding their experience to this dialogue. The CEA conference provides a key forum for farmers to learn more about a new production technology and ways in which to integrate this technology, if appropriate, into their farm business. This forum is also important to provide non-farm stakeholders with a practical, on-farm viewpoint about hurdles that may exist in adopting CEA production technology.





A Strong Future for New York Agriculture



NYFVI perspective on Controlled Environment Agriculture

The New York Farm Viability Institute supports greenhouse agriculture in New York State by funding applied research directed at issues of greatest concern to producers, as well as business planning to help producers adapt to changing markets. The Institute seeks to strengthen collaboration between nursery and greenhouse entrepreneurs and the research community aimed at helping the industry achieve profitable growth.