NCERA-101: Committee on Controlled Environment Technology and Use
2025 Station Report, May 05, 2025
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New equipment and Facilities

The EAE Lab completed the structural separation of a high tunnel to facilitate comparative research on heat derived from various sources. This facility enhancement supports ongoing studies in renewable heating and environmental control systems. Some other basic laboratory equipment, such as a photosynthesis meter, root imaging camera, etc., are added to the lab to continue CEA research.

Accomplishments Summaries

- **Graduate Student Hiring:** Two graduate students were recruited to support research activities in protected agriculture and controlled environment systems.

- **Hydroponic System Trials:** Trials under varying hydroponic conditions are ongoing within one of the high tunnels.

- **Substrate Research:** The EAE Lab has initiated trials on novel substrates to improve performance and sustainability in protected agriculture.

Impact Statements

- The substrate development research will provide critical insights and contribute to future innovations in indoor farming practices.

- Ongoing hydroponic experiments aim to reduce system costs and improve accessibility for small-scale farmers, particularly in cold-climate regions.

Ongoing research projects

- **Project Title:** Defining Humidity Controlling Strategy to Mitigate Fungal Disease for High Tunnel Specialty Crop Production

Funding Program: New Hampshire Specialty Crop Grant Program
Awarding Organization: USDA

- **Project Title:** Protected Agricultural Production Enhancement through Renewable Heating from Aerobic Digestion of On-Farm Biomass
  Funding Program: NHAES Foundational Program
  Awarding Organization: New Hampshire Agricultural Experiment Station

Published Journal Articles

- Wang, D., Mandal, P., Rahman, M. S., & Yang, L. (2025). Engineering tomato disease resistance by manipulating susceptibility genes. Frontiers in Genome Editing, 7, 1537148.

- Ahsan, T. A., Rahman, M. S., & Ahamed, M. S. (2025). Geothermal energy application for greenhouse microclimate management: A review. Geothermics, 127, 103209.

- Sideman, R. G., Hamilton, G., & Orde, K. (2025). Cultivar and Training System Impact Cold-climate Seedless Table Grape Performance in the Northeastern United States. HortScience, 60(3), 278–286.

Other relevant accomplishments and activities

- The EAE Lab participated in the **Greenhouse Open Day** held on April 12, 2025, at the Macfarlane Research Greenhouse, Durham, NH.
- The lab's research and activities have been featured in the following news reports:
  - **UNH Today:** "*Could Manure Help Cool-Climate Farmers Get Closer to Year-Round Farming?*" – Published February 3, 2025.
  - **Concord Monitor:** "*Granite Geek: Moving heat isn't easy, even (especially?) when it comes from manure*" – Published March 31, 2025.
- More graduate and undergraduate students will join the EAE lab in Fall 2025.