

PP Systems 2025 Station Report

NCERA-101: Committee on Controlled Environment Technology & Use

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New equipment

- A shipping container vertical farm (12.2 m x 3 m x 3 m or 40 ft x 10 ft x 10 ft) was outfitted for plant physiology research on-site at PP Systems. The container has up to 1,260 – 2,600 planting spaces for leafy green crops in a recirculating hydroponic shallow-water culture system and can be converted for alternate growing systems or crops in the future.
- Over 300 LED light fixtures (Sananbio, Fluence, and Philips) were acquired for future plant cultivation trials and research experiments.
- High resolution and portable spectroradiometers were acquired for use in research studies beginning in 2024.
- A dark-chamber was constructed with LED strips, an RGB camera, and a Raspberry Pi to perform chlorophyll fluorescence and plant imaging research studies in 2025.

Activities and accomplishment summaries

- PP Systems is excited to announce new ownership! As of July 2024, Gabriella Stueber and Brehn Smith have acquired the company, bringing extensive experience in biomedical and aerospace engineering, product development, and program management from leading medical device organizations. Under their leadership, PP Systems proudly transitions to a woman-owned business, energized with fresh perspectives for the future.
- Building on this momentum, PP Systems has undergone a significant rebranding initiative starting in early 2025, further revitalizing our identity and strengthening our vision for the future.
- PP Systems webinar series enters its 6th year, with 10 total publicly available webinars planned in 2025. Webinar topics share an underlying reliance on methods including leaf chlorophyll fluorescence or gas exchange of leaves or soils.
- 2025 marks the third year of a cooperative partnership with local you-pick operation Cider Hill Farm. The partnership with this small business was established to conduct leaf-level physiological research on a variety of horticultural crops grown in Massachusetts. Over 20 unique species are cultivated at this site, with access permitted to PP Systems for research projects.
- As mentioned above, the new PP Systems shipping container vertical farm will be a focal point for plant physiology and controlled environment agriculture research conducted at our institute. Collaborations will be welcomed and pursued, encompassing a wide range of possible topics, to advance knowledge and contribute to the growing body of scientific literature.

- Data was collected in 2024 investigating plant photosynthesis under 0 – 30% far-red light substitution for five crop species at Cider Hill Farm in Massachusetts. Results are being written up as a paper, which will be submitted for publication in Q2 of 2025, and a follow-up study is planned for Q2 and Q3 of 2025.