

CASE STUDY



NYSERDA
Supported

Real-time LASSI Pilot: Goodness Gardens Inc.

Orange County, New York

Real-time Pilot Launches Evaluation of Energy Use and Crop Performance in Greenhouses

Background:

This series of case studies presents findings from pilot demonstrations of the Light and Shade System Implementation (LASSI), a project supported by the New York State Energy Research and Development Authority (NYSERDA). The work focuses on three approaches to advanced lighting control in greenhouse environments: Basic LASSI, CO₂ LASSI, and Real-time LASSI. Each version was implemented in commercial facilities to evaluate its effectiveness in improving energy efficiency and crop productivity under real-world conditions.

The pilots represent a collaborative effort to translate scientific research into practical applications for greenhouse operators. Over the course of one year, each facility collected data on sensors, crop yields, and utility use, which was normalized using weather data and compared to baseline performance.

These case studies highlight operational insights, economic considerations, and user benefits related to each lighting system. They include product descriptions, lighting demand calculations, cost estimates, and return on investment projections.

Operations at a Glance:

Company: Goodness Gardens Inc.

Industry: Agriculture

Location: New Hampton, NY

Crop: Basil

Goodness Gardens Inc., based in New Hampton, New York, operates a large-scale greenhouse facility specializing in fresh-cut herbs and specialty greens. What began as a hydroponic research project in the 1980s has grown into a thriving commercial enterprise with nearly 350,000 square feet of greenhouse, processing, and utility space. The operation focuses on year-round production of culinary herbs such as basil, parsley, dill, and cilantro, supplying retail and foodservice markets across the country. With a strong emphasis on innovation and quality, Goodness Gardens integrates custom-designed growing systems and efficient post-harvest handling to maintain freshness and consistency from greenhouse to shelf.

Lighting Control

Goodness gardens provides supplemental lighting to their basil crop that provides an intensity of approximately 70 $\mu\text{mol}/\text{m}^2/\text{s}$. The existing lighting control system is based on a hybrid threshold based system with frequent manual adjustments, with the greenhouse operator making frequent adjustments to the setpoints. They do have the ability to set schedules which they take advantage of to set morning lighting. Their crop starts out in indoor racks with 100% of their light supplied by supplemental lighting. To save money on demand charges, this lighting is typically scheduled during the night and occasionally staggered (half of the racks lit at a time for 12 hours each). To avoid incurring larger demand charges, lighting is currently limited to the hours between 7:30 AM and 6:00 PM.

LASSI Performance

The LASSI algorithm performed in a similar manner, in terms of light use, as the existing control system, however it did not require frequent adjustments. Working within the limitations of the intensity of the supplemental lights and reduced hours of lighting available, the LASSI algorithm was able to meet the target of 15 $\text{Mols}/\text{m}^2/\text{day}$ approximately 8% more often than the existing control system, on days where supplemental lighting was necessary (excluding days where the natural light was enough to exceed the target).

Outcome

The grower is interested in continuing the demonstration, and based on what he has learned is increasing the lighting capacity in the new greenhouse being built adjacent to the current facility. In addition, he is requesting that the LED lights he has purchased have the dimming capability enabled. Enabling dimming will provide a finer control to the lighting system, allowing the light output to be dialed down when the natural light intensity is high.