



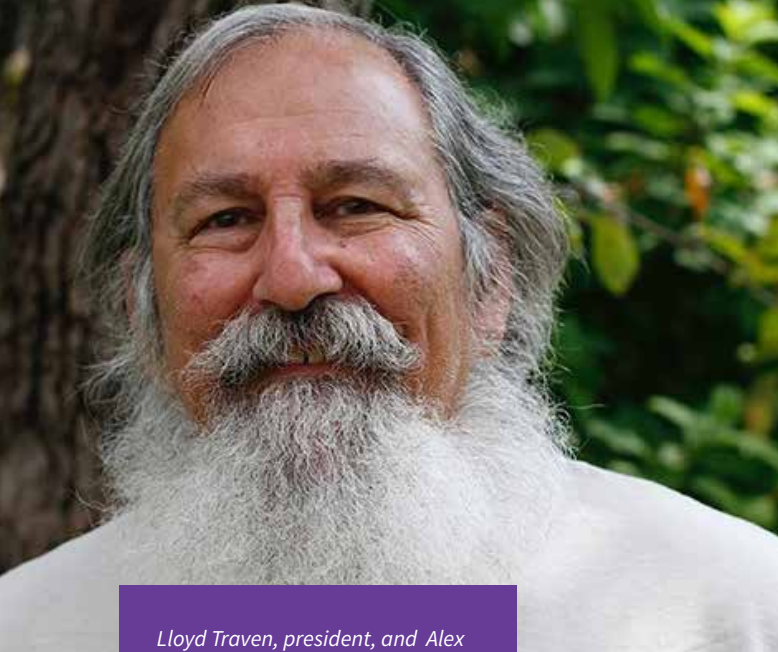
CANDIDUS

**CASE STUDY:  
PEACE TREE FARMS**



*Basil, which is a major crop at Peace Tree Farm, is grown under LEDs controlled by the Candidus lighting control system during summer and winter to ensure plants stay short, dense and stocky.*





Lloyd Traven, president, and Alex Traven, general manager and head grower at Peace Tree Farm



## Peace Tree Farm is upgrading its infrastructure with LED lights and the Candidus adaptive lighting control system to save electricity and money to produce premium herb, vegetable and ornamental crops.

### CASE FILE FACTS

**COMPANY:** Peace Tree Farm

**LOCATION:** Kintnersville, Pa.

**CROPS:** USDA certified organic herb and vegetable liners and finished plants, ornamental plant liners and finished plants.

**TECHNOLOGY:**

Peace Tree Farm is an evolving greenhouse operation in terms of crops produced and technology investment, including LEDs and the Candidus lighting control system.

### BACKGROUND

Lloyd and Candy Traven, who started Peace Tree Farm in 1983, have never been satisfied to maintain the status quo. The husband-and-wife team has seen their company evolve to ensure they are offering exceptional products.

“We’ve been out of holiday crops in any way shape or form for five years now,” said Lloyd Traven, who is president of the company. “There is no hint of red here whatsoever. The quality standards for some of these crops have become so low. It also became difficult to make money on those crops trying to compete with some of the monster operations near us. These crops became a losing proposition for us.”

Another group of plants which Peace Tree Farm has cut back production on is less common, hard-to-find plants.

“We had become known as the unique plant place, the weirdo stuff,” Lloyd said. “A lot of these plants were sold to botanical gardens. The

**“This past November we saved about 15 percent...But during other months when we didn’t have to light as much, the Candidus controller saved us 30-40 percent on our energy bill, which is a significant amount of money.”**

*- Alex Traven,  
general manager  
+ head grower  
Peace Tree Farm*

mindset I had was we were going to be the coolest plant producer. We loved having people come in and be excited about the plants we were growing because they couldn’t get them anywhere else. It was wonderful when people from botanical gardens around North America came in and would go gaga over the plants. The problem was they wouldn’t purchase many of the plants.

**“Once the COVID-19 pandemic hit, the sales of unique plants went away first. Sales to garden clubs and botanical gardens just disappeared.”**

While the pandemic may have had a negative effect on the sale of Peace Tree Farm’s unique plants, it had the opposite effect on the sale of other crops, including certified organic herbs and vegetables.

“First and foremost we are a propagation company,” Lloyd said. “We propagate 99 percent of everything we sell internally. Because we are certified organic we want to have that control. We want to be able to start with biocontrols early in the crop cycle. Everything starts with propagation so this is something we do year round.”

**Lavender and basil are two of the major herbs produced by Peace Tree Farm.**

“We want to be known as the lavender source,” Lloyd said. “We have introduced two exceptional patented intermedia lavenders to the world market.

“Lavender is the number one selling perennial plant worldwide. Part of the reason for this is because it is the only perennial that is planted on



*Peace Tree Farm is using the Candidus lighting control system to provide night interruption lighting year round for downy mildew control on basil plants.*



*Peace Tree Farm is provided with monthly reports from Candidus on the amount of energy it has used and the savings the lighting control system has provided. Photo courtesy of Fluence*

multiple acres. There are lavender farms where the plants are grown as cut flowers, as well as for its oil and for other uses.

“We have reduced the number of lavender varieties we are producing down to eight. We produce both liners and finished plants. Liners are sold to a variety of customers including lavender farmers, perennial growers, pot plant growers, oil producers and mail order companies. The market continues to grow for this crop.”

## CHALLENGE

**Peace Tree Farm has implemented a year-round finished certified organic herb program with Wegmans Food Markets. The grower produces 3½-inch pots of basil, dill, parsley, cilantro, mint, rosemary, sage, thyme and chives. Basil accounts for 50 percent of the program.**

“When we started doing the Wegmans program we needed to grow basil year round because it was a premier product for us,” Lloyd said. “We didn’t think we’d have problems with year-round production because we had already installed high pressure sodium (HPS) lights. When we started growing basil under HPS lights the plants looked fabulous until we touched them and they flopped over. The plant internodes were too long, the stems were weak and the leaves were huge. The plants were fine when they were placed in plastic sleeves, but once they were removed from the sleeves the plants fell over.”

Traven began to investigate plant lighting research which led him to Michigan State University horticulture professor Eric Runkle.

“Erik told me about the effect of blue and red light on plant growth,” Lloyd said. “I told him I needed density and a compact full habit because the basil plants have to look good in the sleeves in the grocery stores. He told me there are specific wavelengths of blue light that morphologically will keep plants shorter. That’s when I really started looking at LEDs because I knew that I would be able to deliver whatever wavelengths the plants needed.”



## SOLUTION

Traven chose to install Fluence LEDs to replace the HPS lights.

“This particular Fluence LED is a very specific clean bright white light,” Lloyd said. “We installed some of the LEDs and the difference in plant growth was like day and night. The LEDs are producing 3½ times the light level as the HPS with much better light distribution and using the same amount of electricity.”

“The basil plants are short and dense and stocky, not floppy at all. We program the lights during summer and winter.”

Peace Tree Farm now also lights most of its propagation area with LEDs.

“We are using the LEDs for a lot of our stock production,” said Alex Traven, who is Lloyd’s son and the company’s general manager and head grower. “These are the plants that we use to produce cuttings for the liners we sell in the spring. The flipside of the propagation is growing the cuttings to propagate. There are a lot of varieties for which we are the cutting source so we have to grow our own stock plants, including rare geraniums and begonias. We grow those plants under LEDs which really cuts down the production time and helps to keep those plants actively growing and prevents them from going semi-dormant because of the lack of light.”

“In the winter we use the LEDs to keep basil plants growing fast enough that it’s economical. In the summer we use the LEDs on basil more for the night interruption as a means of downy mildew disease control than for promoting more growth.”

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*Alex Traven, general manager and head grower at Peace Tree Farm, said the Candidus lighting control system gives him a much better chance of hitting specific daily light integrals and a much better opportunity to save a lot of energy.*





*The Candidus system in use.*

## BENEFITS

To ensure their plants receive the right amount of light year round the Travens have installed the Candidus adaptive lighting control system.

“The vast majority of the time during the summer we don’t need any supplemental lighting,” Alex said. “But the basil plants need night interruption lighting for downy mildew control and the LEDs are really great for that. Blue light has a function in disease control that reduces the sporulation of downy mildew significantly. It’s not a 100-percent silver-bullet strategy for dealing with the disease, but it really helps reduce inoculum and prevent sporulation. It can make a difference in getting a crop to market.

“A low intensity light level is enough to create this disease control effect. **With the Candidus controller I can have the LEDs come on at 20 percent brightness.** Since we are using night interruption lighting year round, having the LEDs come on at a much lower light level provides us with an opportunity to save a lot of money.”

Another area where the Travens have found the Candidus lighting control system to be an energy and money saver is with achieving the optimum daily light integral (DLI).

“One of the big strengths of the Candidus controller is that it can do the math based on a threshold of accumulated light that we are trying to reach,” Alex said. “If the weather is cloudy in the morning, the Candidus controller turns the lights on at 100 percent. If the sun comes out later in the afternoon, the Candidus system knows whether the plants still need additional light to achieve the desired daily light integral and keeps the lights on if necessary.

“Similarly if the sun is out and the light intensity is high, like during the summer, the Candidus controller runs the lights run at a very low level or turns them off completely. If an afternoon storm rolls in at 5 p.m., the Candidus controller knows if the target DLI has already been achieved and whether or not the lights have to come back on. **With the Candidus controller we have a much better chance of hitting a specific light target and much better odds of saving a lot of energy in doing that.**”

Candidus provides the Travens with monthly reports on the amount of energy they have used and the savings the lighting control system has provided.

“The amount of energy and money saved is going to vary from month to month,” Alex said. “The highest savings that we have seen has occurred during the shoulder months, the early spring and later fall months. This past November we saved about 15 percent, but it was a dark month so the lights were on about as much as they could be. But during other months when we didn’t have to light as much, the Candidus controller saved us 30-40 percent on our energy bill, which is a significant amount of money.”

<p><b>MORE ABOUT CANDIDUS:</b>  <a href="mailto:info@candidus.us">info@candidus.us</a>  <a href="http://candidus.us">candidus.us</a>          (518) 290-0483</p>	<p><b>MORE ABOUT PEACETREE FARM:</b>  <a href="mailto:info@peacetreefarm.com">info@peacetreefarm.com</a>  <a href="http://peacetreefarm.com">peacetreefarm.com</a></p>
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# SAMPLE REPORT



**85.9%**  
Energy Savings

**March 2019**  
Savings of  
**\$8,500**

**GH Name**

**Address:**  
XXX

ZONE 1

**Candidus controlled area:**  
1 acre

**Installed lighting capacity**  
10,500 kW

**Maximum LED PPFD**  
115 mols/m<sup>2</sup>/s

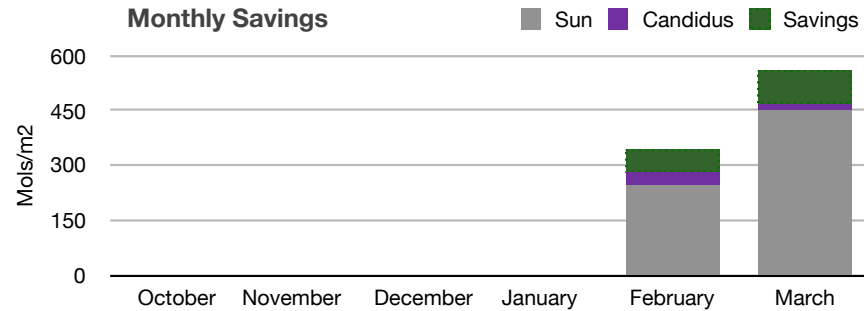
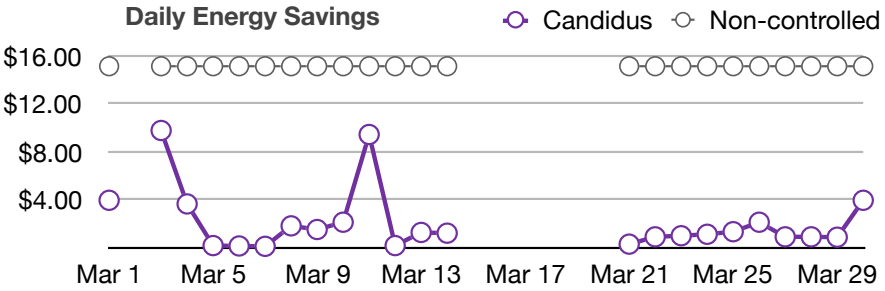
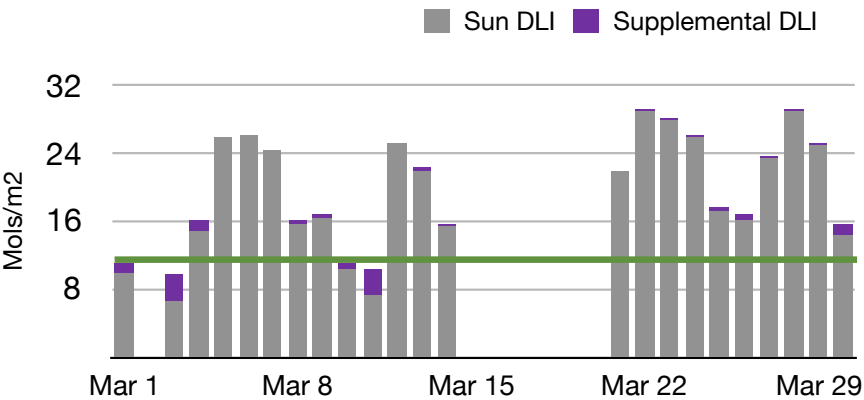
**Photoperiod**  
12h (7am - 7pm)

**Max. supplemental DLI**  
4.96 mols/m<sup>2</sup>/d

**Target DLI**  
11 mols

**Cost of energy**  
\$0.12

Candidus adaptive lighting control continually monitors sunlight to optimize the delivery of supplemental light to both enhance production and minimize energy use.



**YTD Savings**

💰 \$14,370

⚡ 120,000 kW

For any questions please contact us at [erico@candidus.us](mailto:erico@candidus.us)

 **We don't make lights, we make lights better**