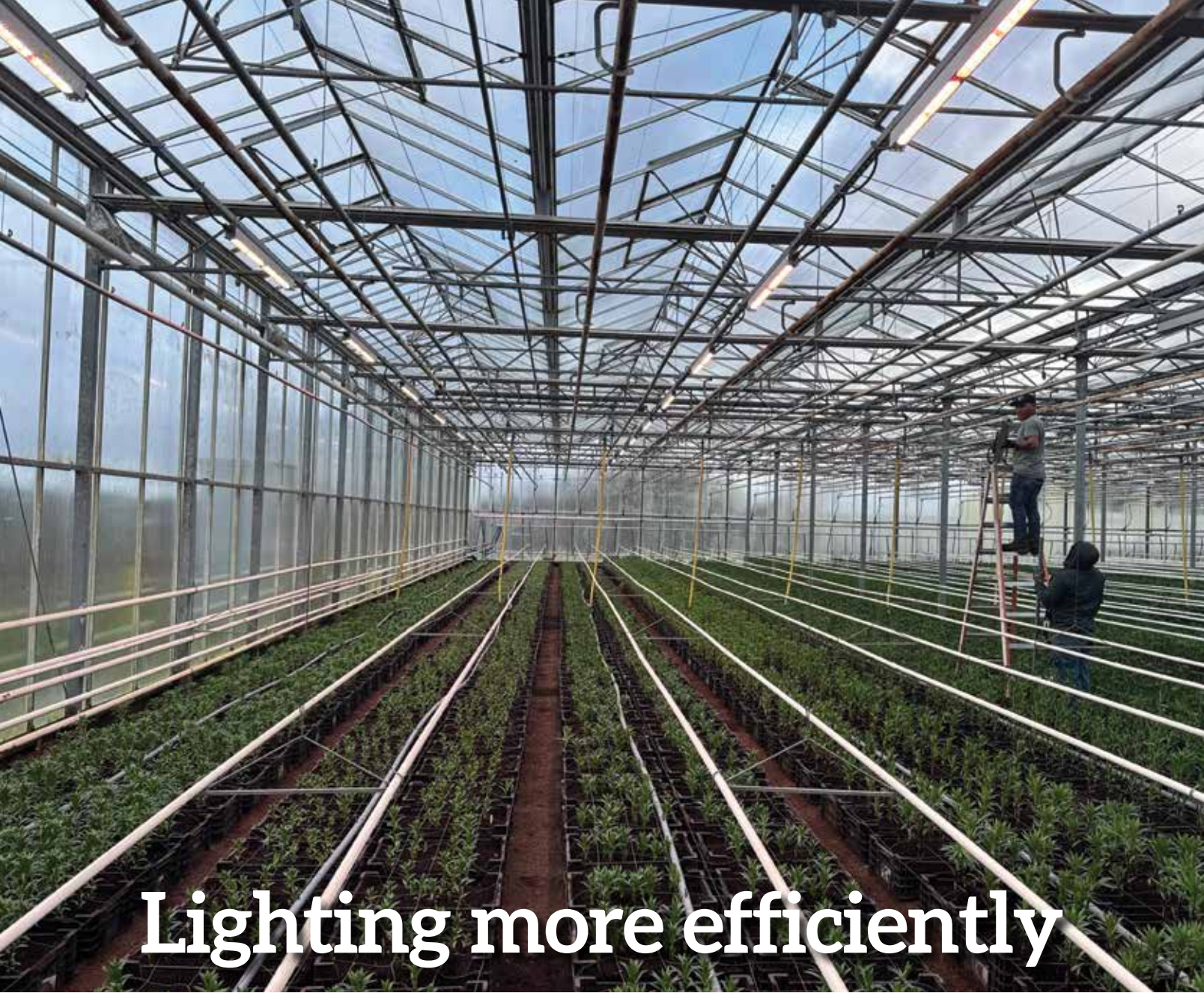

Lighting more efficiently

Octavio Montar Lopez (left) and Rob Fernandez install and test new LED lighting in one of the greenhouses at Oregon Flowers in Aurora, Oregon.
PHOTO BY TYLER MESKERS

Nurseries save energy costs by making the switch to LEDs with help of Energy Trust of Oregon program

BY MITCH LIES

In 2022, the owners of **Oregon Flowers** was thinking of going with LED lighting in a new greenhouse under construction. However, the grower (based in Aurora, Oregon) wasn't confident in its ability to adapt the technology to its lily production.

According to company vice president Tyler Meskers, the nursery wasn't as concerned with energy costs as it is now. Bottom line: The nursey went with what it knew best at the time: high-pressure sodium lighting.

Fast forward to 2024. Energy costs have soared. An incentive program from Energy Trust of Oregon has reduced the costs of purchasing and installing LED lighting. New information has come to light from Europe, where many nurseries switched to LED lighting during the pandemic.

Added up, these developments prompted Oregon Flowers to take the plunge.

"In Europe, they were kind of forced into (energy efficient) LED lighting before us, because their energy costs just went through the roof, and so that really kick-started a lot of those growers in Europe to switch to LEDs," Meskers said. "That was enough for them to say, 'Okay, let's give this a try,' and they found out that the learning curve to grow lilies with these LEDs wasn't as intimidating as they first envisioned."

Oregon Flowers now plans to switch from high pressure sodium (HPS) to LED lighting in all 11 of its greenhouses, starting with five this year. The nursery plans to stagger the installation, hoping to keep production at full capacity during the process. "We are going to chip away at it as greenhouse space becomes available," Meskers said. "Our goal is to put them in within the next month or two."

The nursery is among several Oregon nurseries to have recently taken advantage of incentives available through Energy Trust of Oregon, an independent nonprofit created by the state of Oregon that helps

Lighting more efficiently

Al's Garden & Home installed LED lights at its nursery in Hubbard, Oregon, to cut back on grow time for its rooted liners and early spring crops. The nursery had peviously had no artificial lighting. PHOTO BY VIC PANICHKUL

people, businesses and organizations use less energy and save money on energy bills. Its horticultural lighting incentives, which help offset the upfront cost of LED bulbs, can cover upwards of 30% of the purchase and installation costs of the lighting.

"That helped us make the decision to give this a try and switch over now," Meskers said.

Meskers said the nursery expects the lower energy costs that come with LED lighting to provide a return on investment in four years. He added that if the nursery knew then what it does now, it probably would have installed LED lighting when it first constructed its greenhouse in 2020.

"We just went with what we knew at the time," he said.

Reduced grow time

Like Oregon Flowers, **Al's Garden & Home**, also purchased LED lights for its Hubbard, Oregon, greenhouse this past year. The nursery, which had been growing plants without artificial lighting, decided to install the lighting primarily to cut back on grow time for its rooted liners and early spring crops, said Dorothy Russo, chief of growing operations for the nursery.

"We needed to extend our daytime a little bit," Russo said.

The nursery opted to go with LED lighting versus incandescent lighting both because of cash incentives available from Energy Trust of Oregon and because of the energy efficiency of LED lights.

"I think it is the most energy efficient lighting available right at this moment, and that is what we need," Russo said.

The nursery began adding the lights to the Hubbard greenhouse in December.

Russo said the nursery is looking for a return on investment in as little as three years.

Other benefits

In addition to energy savings, both Al's Garden & Home and Oregon Flowers expect LED lighting to help them produce a better quality product, a benefit that could be particularly significant in some of Oregon Flowers' older greenhouses, where the LED lighting is replacing HPS bulbs that are 10 and 20 years old.

"We should have a better-quality product because we have brand new lights replacing some lights that are 20-something years old," Meskers said.

Also, because the high wattage demands of HPS lights create more heat in a greenhouse than LED lights, the nursery expects to have a more uniform distribution of heat.

"The heat won't be coming from the top down," Meskers said. "It will be coming from the bottom, and it will be drying out the crop, so I think we should get a better-quality product because we're getting rid of some of the humidity."

"We'd rather have our heating source

heat the greenhouse and have our lighting source light the greenhouse," Meskers said.

Al's Garden & Home also is hoping for improved plant performance with the LED lighting. "Others are seeing an improvement in overall uniform quality with the higher lighting," Russo said, "and we are hoping to, as well."

Energy consumption

Still, for most operations, the biggest benefit of LED lighting is the energy savings available when switching from high-wattage incandescent lights to energy efficient LED bulbs.

"Lighting upgrades are often the best and easiest way to make energy-efficient improvements at grow facilities," according to Ashley Bartels, senior marketing manager of energy programs for Energy Trust of Oregon. "When nurseries are looking at where to save on costs, lighting is a great place to start."

Bartels noted that lighting can consume up to 20 percent of a business's energy costs, and switching from incandescent lighting to LED lighting can save a nursery as much as 75% in energy use. "That is pretty fantastic for a lot of our customers," she said.

LED lights also last longer than incandescent lights, according to Bartels, and what's more, their maintenance requirements are lower, according to the U.S. Department of Energy.

Patrick Kamphaus, director of business development for Bios Lighting in Carlsbad, Calif., a company that manufactures and sells LED lighting, said his company provides full warranty for LED lights for seven years. And, he said, the lights can easily last 10 years.

Kamphaus added that the lights and fixtures are easy to clean.

"All our lights are IP66 rated, so you can spray them down with a hose, and we use a tempered glass lens to cover the diode, so, you can wipe them off with a microfiber cloth," Kamphaus said. "It's pretty simple." (IP66 is an International Electrotechnical Commission code indicating a device is protected from dust, oil and water, including powerful jets of water.)

Further, LED bulbs now come in a range of colors, allowing them to replicate specific conditions, like natural

Energy Trust Incentives

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sunlight. "This versatility is particularly helpful for nurseries where precise lighting conditions can influence plant growth and health. LED technology has come a long way," Bartels said.

Casey Rivero, solutions architect for Fluence/Signify, seconded Bartels' comments, noting that the industry has made tremendous advancements, particularly in the last dozen years. As growers become more familiar with the capabilities of advanced lighting LED systems, some are using it to highlight desirable colors in plants and bring out other features.

"They are able to utilize certain wavelengths, depending on the crop, to enhance qualitative aspects of the plant that they couldn't do before," Rivero said.

Rivero added that high pressure sodium bulbs were never intended for use as grow lights. "The technology was designed for human-focused lighting, primarily street lights, stadium lights, things like that, but it was adapted into the horticulture world because there was nothing strong enough out there as far as lighting technology that was really capable of giving crops what they needed. And then people just got used to it, to setting up their environments, their greenhouses, their environmental parameters around the lighting. And it's been kind of the standard and that is what a lot of the genetics were bred with, and that is what a lot of cultural practices were developed under.

"And as technology has expanded, and specifically, LED chip technology, we've seen a very linear trajectory in the technology that is specifically designed for horticulture purposes," Rivero said.

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