The profitable side of green growing

The Climate Friendly Nurseries Project turns up new ways to save money and energy

By Allison Hensey and Jim Owen

When the bottom fell out of the housing market in 2009, the nursery industry suffered a sharp decline in sales, too.

From a short-term perspective, it would have been natural for nurseries to resist making changes beyond those absolutely necessary to survive. However, Oregon’s nurseries have always recognized the value of innovation, leadership and long-term thinking. A group of them decided to meet the economic challenge head-on by aggressively seeking efficiencies and reducing inputs and costs in their operations.

In total, 14 nurseries formed the Climate Friendly Nurseries Project, led by the Oregon Association of Nurseries and Oregon Environmental Council. This three-year, first-in-the-nation project challenged nurseries to analyze their energy and resource use and implement best practices that would help address climate impacts while achieving greater economic efficiency.

Oregon State University and Ecova Consulting were invaluable partners who helped develop a tool for nurseries to measure their energy and resource use and climate impact, and assemble a best practice guide that included case studies and return on investment calculations.

Cause and effect

The participating nurseries undertook a number of different steps to reduce energy and resource use (see sidebar). As a result, they realized an average 20 percent reduction of greenhouse gas emissions and a number of cost-saving efficiencies.1

Although nurseries are not high emitters of greenhouse gases, they are particularly vulnerable to the effects of climate change. As such, they are in a unique position to lead the way on low-carbon practices that save energy, use less water, and reduce pollution. They also directly support one of the solutions to climate change: planting more trees.

In the end, the nurseries reduced their climate emissions significantly. However, they reported that the most important impact of the project was a cultural and behavioral change in how they conducted business. Whereas before managers and employees simply did things the way they’d always been done, this experience empowered them to continually look for efficiencies.

Participants found that the mere act of measuring and reporting resource and energy use drives efficiency. Moreover, it can change the operational culture of a business.

Nurseries noted that tracking energy or resource use beyond electricity (such as propane or fertilizer) is desirable, but is very challenging because the data is not available electronically from providers in an easy-to-use format.
On-the-ground results

One of the most exciting aspects of the Climate Friendly Nurseries Project was the fact that different businesses took different routes to realize savings.

Evans Farm in Oregon City installed a drip irrigation system throughout the entire nursery to water crops more efficiently. Drip irrigation also can limit fuel consumption and pollution from runoff. The nursery plans to install a solar array to power that system, which will reduce and fossil fuel consumption as well as costs.

Eshraghi Nursery in Hillsboro, Ore. installed drip irrigation systems and more efficient variable frequency drives. On top of that, the grower will be adding new plant potting equipment to cut down on truck trips and diesel use. The nursery also created an energy team to motivate employees to constantly seek out more efficient ways of doing things.

“This project was an eye-opener,” Eshraghi farm manager Chris Lee said. “Tracking our energy and resource use is a great way to know ourselves and see where money is being spent. We also were able to compare ourselves to other nurseries, which was helpful in understanding where efficiencies were possible.”

J. Frank Schmidt & Son Co. of Boring, Ore. also participated in the project, as did Northwoods Nursery, based in Molalla, Ore.

“You have to change expectations when seeking efficiencies,” said Sam Doane, a production horticulturalist at J. Frank Schmidt. “When we converted to drip irrigation, we had to realize 1.

1The project consultant, Ecova, also analyzed reduction of GHG emissions per unit of annual production to take the economic downturn into account. While it’s impossible to fully account for the economic downturn, per production-unit GHG emissions were reduced by 36% over the three-year project. It’s important to note that a number of the best practices were implemented in 2010 or 2011, and resulting efficiencies and input reductions are not fully captured in the reporting. We expect the true benefits and impacts of the project to continue, and further reductions in emissions in the future.

Participating Climate Friendly Nurseries Project nurseries implemented more than 15 best practices, including:

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<thead>
<tr>
<th>PRACTICES</th>
<th>BENEFITS</th>
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<tr>
<td>Installation of drip irrigation and moisture monitoring systems</td>
<td>Saving water, fertilizer, electricity and fuel.</td>
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<tr>
<td>(including one nursery’s planned phase two solar PV installation to cover</td>
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<td>all irrigation-related energy needs)</td>
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<td>Fertilizer efficiency projects, including fertigation</td>
<td>Saving fertilizer, fuel and labor.</td>
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<td>Lighting efficiency upgrades</td>
<td>Saving electricity and labor.</td>
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<td>Increasing efficiency of greenhouse heating and cooling</td>
<td>Saving propane and electricity.</td>
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<td>through installation of an under-bench heating system and installation</td>
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<tr>
<td>of double-wall IR poly and greenhouse film</td>
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<tr>
<td>Installation of Variable Frequency Drives (VFDs) in irrigation pumping</td>
<td>Saving electricity and water.</td>
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<td>stations</td>
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<td>Creating an Energy Efficiency Team</td>
<td>Empowering employees to make recommendations</td>
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<td>for saving electricity, water, fertilizer,</td>
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<td>fuel and other resources.</td>
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Climate Friendly Nurseries Project objectives achieved:

- Developed a tool for Oregon nurseries to measure and understand their energy and resource use and resulting greenhouse gas (GHG) emissions.
- Developed and shared the most cost-effective best practices for nurseries to increase efficiency, reduce their energy and resource use, and lower GHG emissions through a comprehensive best practices guide: Best Management Practices for Climate Friendly Nurseries. Recommended best practices helped reduce heating and cooling costs, increase lighting efficiency, improve smart plant nutrition in field and containers, promote wise water use, and encourage the reuse of plastics and soil.
- Educated the nursery industry about technical assistance and financing incentives available for adoption of best practices through presentations at industry chapter meetings and through resources on the project website.

Results:

- Participating nurseries measured GHG emissions from 2009–2011 and adopted best practices to reduce energy, resource use and GHG emissions.
- Highlighted and shared video and written case studies on best practices from leaders in the Oregon nursery industry.
- Demonstrated industry leadership in efficient, sustainable production of quality plants and trees.

All of these tools and resources are available for download at www.climatefriendlynurseries.org.

that the dirt at the surface should be dry. Now we have to trust the soil moisture monitoring equipment to tell us if there is enough moisture at the plant roots.

“With fertigation, we’ve significantly reduced our fertilizer costs by one-third to one-half, and reduced diesel use and labor. Now if we test [what we’re doing] by missing a fertigation application, the plants turn yellow. That’s how we know we’re applying the right amount and no more.”

According to Lorraine Gardener of Northwoods Nursery, the cost of fuel motivated the nursery to evaluate its energy use.

“Seeing the cost and amount of propane we were using spurred us to action — it was motivating,” she said. “We’re now questioning everything about how we do things with fresh eyes. We’ve worked with our propane provider to match invoices with greenhouses so that we can track the propane savings from greenhouse heating and cooling efficiency projects we’ve implemented, like installing under-bench heating.”

Broader business takeaways

In concluding interviews, the participating nurseries emphasized that the project was not just about replacing equipment with more efficient models and systems. Rather, the key is increasing efficiency in operations and maintenance.

Many of these changes have modest or no costs, and they have a lot of co-benefits, such as reducing vehicle trips and labor costs.

“We learned from this project that there are a lot of opportunities for efficiencies in nursery operations that benefit both the bottom line and the environment,” said Allison Hensey, the food and farms program director for the Oregon Environmental Council. “We’re lucky to have so many industry leaders in Oregon willing to push the envelope to find efficiencies and share what they’ve learned.”

Participating nurseries also discovered that energy audits are not always a good use of their time. To ensure an audit is worthwhile, auditors must understand nursery operations and industry-specific equipment and systems.

While tracking energy, resource use and costs was extremely valuable, it was also time-consuming. Going forward, most nurseries will balance the value versus the cost of tracking. They will only continue to track those cat-
For the purposes of GHG accounting, GHG emissions are broken into three categories or scopes. The separation of scopes is critical to adhering to mandatory reporting guidelines and the calculation of GHG inventory.

Scope 1 emissions are those over which a company has direct control via ownership of activities. This includes emissions from all stationary and mobile equipment.

Scope 2 emissions are those that a company has indirect control over, based on the amount of power they require to run their business. This category includes all purchased electricity, heat or steam.

Scope 3 includes the emissions from all activities that are purchased from other companies, and are not generally in the company’s direct control but which the company can influence by the goods and services it chooses to purchase. This includes such categories as employee commuting, business travel, fertilizer and pesticide use, and the transport of goods and services by other companies (GHG Protocol, 2004).

categories of inputs that are most important to them and not too time-intensive. Electricity use is one example; that data is usually available electronically.

Another takeaway was the need for technology and systems that track electricity and resource use in real time, electronically, so businesses can make immediate adjustments. That would be preferable to the current system, which relies on bills and invoices that supply two-month-old information.

Several nurseries said they’d love to have notification of energy and other resource use available by smartphone in short order so that they can use the information for current management decisions. Nurseries certainly would appreciate any company or utility providing this technology. It would increase growers’ opportunities to become more operationally efficient.
Going forward

The Climate Friendly Nurseries Project shows a real commitment to efficiency and environmental protection by Oregon’s nursery industry. What’s more, it directly answers claims by the Midwest and Northeast nursery industries that buyers should purchase from them to reduce plant miles and resulting carbon emissions.

A recent study by the University of California at Davis and the U.S. Department of Forestry shows that transport emissions account for only 16 percent of total nursery production greenhouse gas (GHG) emissions. Therefore, nurseries that focus on production efficiencies can reap higher rewards in cost savings and GHG emission reductions than those that simply reduce transportation miles.

Sometimes when an industry or business model is successful, there is resistance to taking the time and effort to be more efficient. The benefit of economic hardship is that it forces businesses to look at their operations and practices, and figure out where money, time, and energy savings can be realized.

Going forward, participating businesses report that the most significant impact of the Climate Friendly Nurseries Project is a cultural change in their business operations. They now feel empowered to continuously look for more efficiency. Even better, they have the confidence that comes with knowing savings are both possible and will pay off in multiple ways over time.

It’s great to see the Oregon nursery industry, with $744 million in annual sales, proving that sustainability and profitability can go hand in hand.

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