

Combating Rising Energy Costs

The industry is feeling the effects of the economy, and no one is going untouched by it. Here are some ways to maintain a more energy-efficient greenhouse.

By Jasmina Radjevic



The owner of this roof received grant money for replacing the corrugated fiberglass roof with triple-wall polycarbonate. (Photo: Rough Brothers)



The primary strategy for retaining heat in greenhouses is by using an energy curtain system. (Photo: Nexus Corp.)



RCO2 is a new type of cloth similar to a 10-millimeter polycarbonate. (Photo: Cravo)

It seems no one can escape the effects of today's volatile economy. For growers, input costs continue to rise, and in order to secure a profit, you must cut costs in every possible way. Energy conservation seems to be the biggest concern as growers plan for the next growing season.

Greenhouse structure and equipment manufacturers have been offering energy-efficient products for years. Now, they're becoming more innovative in their offerings. These companies are seeking new ways to assist growers in maintaining a structure that is both energy efficient and productive.

It is not just small growers or those in certain geographic areas who are affected. "I see every grower extremely concerned and looking for every alternative available to conserve energy," says Tami Churchill, vice president of AmeriLux International.

There are many ways to view energy conservation — and it's all relative, according to Jeff Warschauer, vice president of sales of Nexus Corp. "You can put glass in the roof and argue, 'Well, I get more light and my crops grow faster, so I don't have to heat as long' versus the individual that says, 'I use double-wall polycarbonate 8 millimeter,'" he says. "The polycarbonate was yellow after a while, so they look at the cost of what glass is forever. So you save \$10,000 in energy over 10 years, but now you have to change your roof in 15 years because it's starting to yellow. You can look at that a lot of different ways."

Growers can equip their structures in a variety of ways to conserve energy. It depends on many different variables: Where are you located? What types of crops do you grow? How much money can you invest? These are just a few of the important questions growers need to ask themselves before moving forward with an energy-conservation plan.

Reducing Heat Loss

The first step for growers who want to tackle energy consumption is to start with an energy audit, suggests Kurt Parbst, president of Ludvig Svensson, Inc. An energy audit will help "to find out where they're consuming energy in the greenhouse and understand what to do about it."

For almost all growers, heating is the largest expense. Most greenhouse manufacturers offer

various types of heat-retention blankets, curtain systems and similar products. "Everybody may word it a little bit differently, but as a general rule, I think this speaks for the industry: Coverings, energy curtains and types of heating are the three primary items we deal with in the industry," Warschauer says.

Bill Vietas, commercial division manager for Rough Brothers, agrees: "As far as the complete project, we're doing a lot more energy curtains in the new structures but also a fair amount in existing structures."

What is most important is doing the research and making sure to do what makes the most sense for the product and the business.

Most greenhouse manufacturers understand the various options out there, so they will assist growers in analyzing all their options to see what will get them the greatest return on investment. "We typically can help with payback for that curtain, and we can help them analyze whether it makes sense or not for their conditions to put a curtain system in," Vietas says.

A heat-retention system can reduce heat loss anywhere from 30 to 40 percent, according to Chuck Sierke, territory manager for Cravo Equipment, Ltd. They are now specifically offering a cloth, RCO2, on the roof, which is equivalent to a 10-millimeter polycarbonate. As a comparison, one grower in Ft. Pierce, Fla., had two houses side by side that were connected and divided into two zones. One house had a standard heat-retention cloth, which got a 10-degree retention from the outside. So if it was 40° F outside, it was 50° F inside the greenhouse. However, in the second zone, the grower used the new 10-millimeter polycarbonate, which delivered a 23-degree difference in temperature.

"Just putting in a heat-retention system would probably pay for itself in two seasons, but if you

structures

go to the RCO2 cloth, the return on investment is going to be even quicker because you're getting over double what your normal heat retention would have been," says Sierke.

Another option, besides a thicker polycarbonate, could be to add a dual-curtain system. Pleasant View Gardens, with two locations in New Hampshire — Loudon and Pembroke — was the first grower to install a double curtain from Nexus. "Instead of having a 40 to 50 percent shade, which is what most growers use in the Midwest and the Northeast, we put up a clear, almost like Saran wrap...on the lower side of the greenhouse closest to the floor," shares Warschauer. "So now the one that was more of a shade system energy cloth that took light away is open. And when it is completely closed, the one that is more like a Saran wrap offers 10 or 12 percent shade." This way, the grower enjoys the heat-saving benefit while still getting the light.

According to Warschauer, Pleasant View Gardens ran some spreadsheets afterward and think the payback on the dual-curtain system was two and a half years.

What is most important is doing the research and making sure to do what makes the most sense for the product and the business, Parbst says, "because you can grow a great crop with no curtain, but you're



The blackout curtain (on the right side of the truss) is used to create short days and reduces the heat loss rate of the greenhouse by 75 percent at night. The shade curtain (on the left side of the truss) is used with the roof open when plant temperatures become too great. (Photo: Ludvig Svensson)

going to have to burn more fuel just to get to the same place."

Other Opportunities Within the Greenhouse

Although the roof accounts for the majority of a greenhouse's

heat loss, there are other areas that can add to heat loss. Some growers are insulating their north walls, according to Vietas. "Or some people are checking doors. Some people put up partition walls to make their zones smaller

and open up shorter areas." These options vary by grower.

If a grower has only poly or corrugated materials on the side walls and ends, particularly on the north walls, one way to reduce heat loss could be to change that material to

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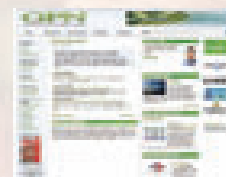
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Double-curtain systems are being used for energy savings, and some growers are even going to three layers. (Photo: Rough Brothers)

a twin- or triple-wall polycarbonate or acrylic, Sierke suggests.

Cooling Options

Although heating is generally the largest energy expense, in some cases, cooling may be a high expense for growers as well, says Parbst. To cut back on cooling costs, many growers are looking to natural ventilation. "We see a lot of drop curtains and roll-up curtains," shares Linda Barnett, vice president of sales for Stuppy Greenhouse Manufacturing.

The cooling system's cycle can cost growers a large amount of energy. Barnett suggests keeping cooling equipment in good operating order. They must be cleaned and drained so that they don't overwork. "I've always been a big advocate of preventive maintenance as well as timely maintenance," she says. "It's like in the summertime, they recommend you drain your sub tank and clean it every two to three weeks while your pumping cooling system is running. And that is how it costs growers the most energy. When it gets dirty and full of algae, salt and minerals, it clogs the pads. Then it doesn't cool as well. So the fans are always trying to achieve that cooling cycle."

To help with cooling, "Lexan now has high light quantity and quality SoftLite Multi-Wall Polycarbonate," says Jim Ralles of ARI, a manufacturing representative for AmeriLux International. "Due to the use of 100 percent diffusion and energy distribution, plants can handle more energy which reduces cooling demands." And the more

comfortable climate also boosts workers' productivity.

One Step At a Time

Many of the options discussed in this story are reasonable investments for most growers, but of course, looking to the future, there will be plenty more opportunities to improve energy efficiency.

"After you've done your energy audit, you've found all the opportunities for conserving energy and for improving energy efficiency, then you can start looking at renewable energy sources," says Parbst. Some longer-term investments include wood boilers or using solar power or wind power.

To offset the high costs of some of these products, Churchill says more growers are recycling, contacting their state-sponsored energy savings department and applying for rebates or grants on purchasing energy-efficient products in their greenhouses. Of course, not everybody can afford going after a large high-efficiency biomass system, but "people shouldn't be frozen," says Vietas. "If you do something every year, it adds up a lot. We talk to a lot of growers who want to do something great, but that's going to cost a lot. But they can do something small and keep going at it." **GPN**

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