

# AVOID HEAT LOSS, AVOID AN EXPENSIVE WINTER

*As winter approaches, here are some tips to ensure you are providing the optimal environment at a low cost.*

**BY CHRISTOPHER MACHNICH**

**W**inter is coming and there's no avoiding it. Luckily, modern technology has made it easier than ever to establish a year-round grow cycle in a greenhouse, so while you're trekking through the snow to get to and from your structure, your crops are resting nice and comfortable in a controlled climate.

But with a controlled climate greenhouse can come long winters of calculating heat loss and paying expensive heating bills. While these factors are inevitable parts of growing throughout the winter, creating a year-round grow cycle makes it absolutely worth the cost. Besides, there are a number of things growers can do to mitigate heat loss and reduce how much they spend each month.

Let's take a look at how utilizing energy curtains and choosing the proper greenhouse cladding can help growers avoid an expensive winter.

## ENERGY CURTAINS

Installing energy curtains is a smart way for growers to retain heat and lower their bills during the winter months. Curtains are typically deployed across the roof during the night, creating a thermal barrier that traps heat within the structure. The curtains generally run across the greenhouse from gutter to gutter, and besides holding in heat, they also can reduce the amount of space that needs to be heated.

Creating an additional thermal barrier during the winter months is a clear win for growers, but just how much money can an effective curtain system save?

Will Kacheris, who designs custom greenhouse systems for GrowSpan Greenhouse Structures, offers this: "Whenever a customer asks how much energy curtains really save, I point them to a study done at Michigan State University, which found that energy bills can be reduced by up to 30% using modern, automated energy curtains during the winter months and as shade in the warmer months."

While curtains are generally used during the night, some growers have opted for a two curtain system that features a daytime curtain that provides high light transmission and a denser curtain at night. However,

this can hinder the amount of light that actually gets to the crops.

To provide ample light, most growers will only use curtains at night, and ideally they should opt for a custom system. Since these systems require both material and framing, they can block light even when they aren't being used. In a custom system, this blockage will be minimal, since it was designed for the specific structure it's being used in, and generally won't be a factor growers have to consider.

Energy curtain systems can be completely automated and run on a feedback-based system, so labor costs don't have to increase. With a system like this, growers will have to make sure their sensors are properly placed and kept clean to maintain full functionality.

Kacheris also adds, "Curtains can help with light pollution, if that's a concern in your area, and there are also hybrid screens out now that can serve as both energy curtains and shade for the warmer months."

## GREENHOUSE CLADDING

Adding an energy curtain system to a greenhouse can be a great way to reduce heat loss, but to truly maximize heat retention, growers will have to take a look at what their structure is actually made of. While recovering a structure can be costly, improvements in cladding can make all the difference in the winter.

To maintain the highest heat efficiency during the winter months, it is essential that growers consider the R-value of the material used to cover their structure. R-value is the measurement of thermal resistance that a given material has, and the higher the R-value is, the better that material is at insulating the growing structure.

The importance of R-value is clear when growers look at how heat loss is calculated. The equation used,  $Q = A(T_i - T_o)/R$ , calculates the amount of heat lost in BTUs per hour. In the equation, A is the area of the greenhouse, while  $T_i$  and  $T_o$  are indoor and outdoor temperature respectively. R is the R-value of the structure, so it is clear that by having a higher R-value, Q will be a lower number, and in turn, lower BTUs lost an hour.



When choosing a cladding, many growers first choice is something hard and durable with plenty of light transmission. This leads them to often choose between glass and polycarbonate. For cold weather growers, the choice is clear after considering the R-value of both materials. A 3-mm glass greenhouse cover will provide an R-value of .95., while a twin wall polycarbonate cover will provide an R-value of

1.72. With nearly twice the insulation of glass, polycarbonate becomes the clear choice in regions dealing with cold weather. Besides the superior R-value, polycarbonate is also much lighter, so installation and maintenance is much easier.

In regards to greenhouse cladding, Kacheris says, "Some growers have ditched clear sidewalls and instead gone with non-light penetrating, heavily insulated sidewalls and gable ends, especially in the cannabis industry. We have been installing a lot of double-wall steel with insulation filling between the two layers in Northern climates. However, if a grower wants to utilize as much sunlight as possible, 8mm polycarbonate provides an economical way to get great light transmission, a 10-year warranty and insulation."

But what about growers using a film-covered greenhouse? In these instances, an air inflated double poly film is a great option, and may be the best option dollar for dollar. Air provides fantastic insulation, so by forcing air between two layers of film, structures can get an R-value as high as 1.5. The film can be inflated using a small fan. Although this requires some electricity, it is about the same as running a light bulb, so energy consumption does not become a real factor.

Winter is always going to be an expensive season for growers in cold climates. However, there are a few things they can do to reduce their seasonal costs. By integrating an energy curtain system and considering a structure's R-value, growers can reduce heat loss and limit the amount fuel used for heating. From there, growers can look into improving the efficiency of their heating system, but that's for another article. [gpn](#)

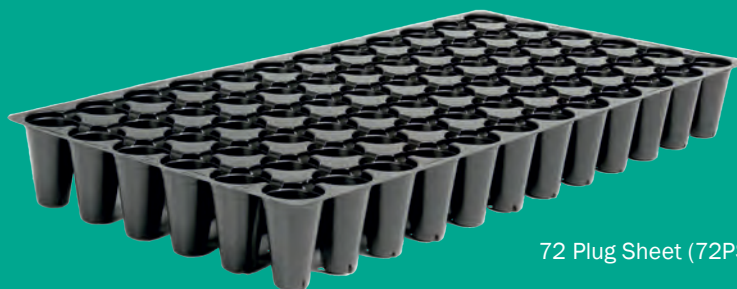
*Christopher Machnich is digital marketing manager for GrowSpan Greenhouse Structures. For more information, go to [www.growspan.com](http://www.growspan.com).*



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