GROWERTALKS

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Before You Glaze

Al Sray

It's not a big secret—there's no perfect roof glazing for a greenhouse. Growers know there's always a trade-off to be made when selecting their roof coverings. Each has its advantages and disadvantages, so many options need to be considered when determining the best covering for your particular needs.

Pictured: Keeping the greenhouse well-ventilated and as cool as possible should be the first issue discussed and open-roof, atrium-style greenhouses have been proven to maximize air movement and cooling. Shown here is the Nexus Dual Atrium structure with glass roof.

Initial upfront investment is usually the question that comes up when discussing a new project. We all have budgets that we need to consider—and that usually drives the majority of our decisions. But let's talk about that last. After all, if you build a greenhouse that fits your budget, but not the cultural needs of your crops, it'll be a constant fight for you or your grower to produce the quality product that your customers demand.

Other important details should be the driving force behind this decision. Let's examine some of those forces when looking at some of the most popular roof glazings.

Light transmission

If high light transmission is vital to your crop, then there's no question glass is your best option for your roof glazing. Clear, tempered glass can transmit as much as 90% of available natural light. Other coverings don't fare as well—8 mm twinwall clear polycarbonate transmits 80% to 82% of available light, 8 mm twinwall acrylic transmits about 84% and clear 6 mil. double poly about 76% of available light. (Percentages are estimates and are provided by individual glazing manufacturers and as such may vary.)

In the past several years, diffused roof coverings have been introduced into the market in each of the different glazing styles to very positive reviews.

Energy costs

With heating costs being one of the highest input expenses (depending on region, of course) for most greenhouse growing operations, the ability to retain heat and be as energy efficient as possible is often the overriding factor in making a roof glazing decision.

Standard 4 mm, tempered roof glass gives you an R-value of about 0.94. This can be very difficult to deal with in Northern climates. It's a must to use heat retention that can double as a shade curtain system in conjunction with roof glass. Glass transmits much of the heat energy into the greenhouse in the warmer months, which can cause heat buildup and be tough on some varieties of plants.

It can be difficult to determine 6 mil. double polyethylene R-values. If inflated properly and maintained, the R-value is about 1.4. However, those are big caveats. If over- or under-inflated, those R-values can be significantly affected.

Eight millimeter twinwall clear polycarbonate has a much higher R-value than glass at about 1.5. This can mean a significant savings on energy costs—especially if used in conjunction with a heat retention and shade curtain. Also, because less light and heat are being transmitted into the greenhouse, this covering will keep the temperatures down during summer months.

Eight millimeter twinwall clear acrylic has similar R-values to polycarbonate. Additionally, in many warmer climates, corrugated polycarbonate and corrugated acrylic are also viable options. But in this article, we'll be focusing on the more heat retention-efficient roof glazings.

Maintenance/lifespan

There's no question that double polyethylene greenhouses require more maintenance than other greenhouse glazings—from making sure that the inflation levels are correct and the inflation fans are running properly to making sure debris hasn't punctured small holes in the poly. Poly needs constant maintenance and attention, not to mention that it needs to be changed every four years.

Eight millimeter twinwall polycarbonate doesn't require nearly as much maintenance. Light levels do decrease every year. At some point structural integrity can be affected, but it's not uncommon to see this material on a roof for 15 years or more. It's just a matter of dealing with decreasing light levels. Eight millimeter twinwall acrylic also doesn't require as much maintenance. It can carry up to a 30-year non-yellowing guarantee.

Ventilation needs

Not all roof coverings are ideal for all styles of roof vents. Keeping the greenhouse well-ventilated and as cool as possible should be the first issue discussed. Open-roof, atrium-style greenhouses have been proven to maximize air movement and cooling. But are all roof glazings ideal for this style of roof vent? Nexus believes that there are better options for natural ventilation when you're using double poly coverings. The inflated poly puts pressure on the vent system, which can cause maintenance and closing issues. It's a constant maintenance issue to keep the poly tight in the vents. If the roof vent isn't sealed tight, it can cause significant

water intrusion.

Pictured: The unique design of the Zephyr by Nexus allows for all the benefits of high-end, functional natural ventilation, without the drawbacks.

To avoid these issues Nexus takes a different approach. First, we recommend a Zephyr-style greenhouse. This isn't an open-roof style; instead, its unique design allows for all the benefits of high-end, functional natural ventilation, without the drawbacks.

One roof slope is higher than the other and this creates a natural vent. This vent is at the top of the greenhouse, allowing hot air to escape from the highest point. Another advantage is that the prevailing wind comes over the top and creates a vacuum and actually pulls the hot air out of the greenhouse. There are a variety of styles of vents for the Zephyr to fit different budgetary needs.

The other option is that if a grower really believes open roof ventilation is the right way to go, Nexus designs our atrium roof vents with a double poly twist. We make the vents 8 mm polycarbonate and the roof slopes as double poly. This helps avoid all of the pitfalls of double poly in the vent, but still gives the ideal natural ventilation.

Of course, every style of roof vent style can accommodate glass, 8 mm twinwall, polycarbonate twinwall or corrugated, or acrylic.

Upfront costs and ROI

It's clear that each roof glazing has its positives and negatives that need to be thoroughly examined. But the final, and for many, the determining factor in choosing the correct type of roof covering is cost.

Double poly is far and away the least expensive initial investment. Less structural steel is needed for the roof of a double poly greenhouse. In addition, there's no aluminum roof bar system needed to hold it in place. But if you consider that the poly needs to be changed every four years—and more money and time will be spent on maintenance—it's not just as clear cut as saying double poly is the least expensive.

Many expect 8 mm twinwall polycarbonate to be good for 10 years or more, but the upfront investment is higher. A more significant roof structure is required, as well as an aluminum roof bar and cap every 72 in. to hold it in place.

Nexus features a gasketed aluminum bar base and cap system. This seals extremely well and provides added strength to the roof structure. Eight millimeter twinwall acrylic has a significantly higher initial investment cost than polycarbonate, but it can be in place for a much longer period of time.

Nexus flexibility

Many of Nexus' greenhouse styles have the flexibility to be converted from double poly to one of the rigid coverings. This allows for a lower initial investment. Then, after four years of monetizing your new greenhouse, you can convert to a higher end, lower maintenance facility.

The bottom line when it comes to roof glazings is that there's no one-size-fits-all answer. All details must be carefully considered and the best decision should be made for your particular needs. **GT**

Al Sray is Midwest Sales Manager for Nexus Corporation in Northglenn, Colorado.