

Greenhouse glazing tips

Correct installation of film plastic can result in significant heating savings

Film plastic is still the most popular covering for commercial greenhouses. It has allowed the greenhouse industry to become a dynamic and expanding agricultural segment in the United States. Its low cost, ease of application and extended life with high light transmission makes it an excellent material for most crops.

I frequently get questions

about how plastic should be installed to ensure a long life without problems. The following tips may help.

► **One or two layers?** Two layers of 6 mil are the standard. It saves 35 percent on heating costs as opposed to a single layer. When inflated, it keeps the plastic tight, reducing stress on the connections. It reduces condensation,

as the inner layer is warmer. It also provides a level of insurance should one layer tear. One layer may be adequate for high tunnels covered for season extension in the spring. This also works fine for nursery narrow overwintering hoophouses. Woven or scrim-reinforced plastic may be needed in windy locations.

► **Is the infrared (IR) additive worth the extra cost?** This additive traps the radiant heat captured and generated inside the greenhouse at night. The savings have been measured to be between 10 and 20 percent, depending on whether the sky is cloudy or clear. For a greenhouse heated all winter, the payback is achieved in only a couple of months. The IR material is installed as the inner layer because



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HAVE A QUESTION?



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it usually includes an anti-condensate additive to reduce moisture drip.

► **How tautly should the plastic be installed?** There are a couple of variables that affect this. Plastic expands and contracts with temperature. An ideal installation temperature is about 50°F, which usually occurs in the spring or fall. The plastic on an A-frame greenhouse should be snugged up a little more than on a hoop- or gothic-shaped structure due to the flat shape of the bars.

► **How much space should there be between the layers?** The amount of space is not as critical as one might think. Heat moving from inside to outside of the greenhouse has to pass

through a boundary layer of air on each side of each sheet. This provides most of the insulation. Heat movement through the air space between the layers is driven by convection currents. The difference between 1.5 inches and 6 inches of space adds about 1 percent to the total heat loss.

► **Inside or outside inflation air?** If the plastic has been installed properly without any leaks or holes, there is very little air blown between the layers once it is inflated. The blower is just holding the pressure similarly to the way you would blow up and hold a balloon. Under this situation, where the air comes from is not critical. But a batten may loosen slightly, or the plastic may get punctured with a few small holes. Then there

is air exchange, and the drier outside air reduces the potential for moisture condensation. I have been in greenhouses where several inches of water collected between the layers.

► **How critical is it to maintain ¼-inch static pressure between the layers?** The research that Professor Bill Roberts at Rutgers University did when he first introduced the inflated double layer concept showed that ¼ inch was an optimum pressure. Going below this level will allow the plastic to ripple on windy days, putting stress on the endwall battens. This can lead to tears. Overinflating tends to stretch the plastic. Use a homemade or commercial manometer to measure the pressure. Adjustment is made by opening or clos-



Providing outside air reduces moisture condensation between the plastic layers.

ing the intake on the inflation blower or adjusting the motor speed with a rheostat.

The service life of film plastic can be improved by following these basic guidelines. There are very few problems that occur with today's greenhouse-grade material. GM