REDUCE GLASS GREENHOUSE HEATING COSTS

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As fuel oil prices rise and supplies become shorter, growers are looking for methods to reduce their costs. Heating costs in some glass greenhouses can be reduced substantially by creating an insulation barrier with an air supported layer of polyethylene applied over the glass. This method is better than placing the poly inside as (1) it is easier to install and (2) it will deflate and allow snow to melt if it is overloaded. A saving in fuel cost of 30 percent can be realized in a tight greenhouse and as much as 50 percent in a poorly glazed one. Reports from growers who have tried this technique indicate that it results in more uniform temperatures in the greenhouse and also that there is less glass slippage.

Which houses can be double covered? Generally the well glazed, narrow width houses are the easiest to cover. The house should not have any scaffold pins. The house should also be structurally sound. With poorly glazed houses, a double layer of poly will be needed. In wide houses, more than one sheet of poly may be needed to cover the surface. Trials with construction grade polyethylene have not been too successful. Better results were obtained with the two-year copolymer (Monsanto 602) and with the longer life woven copolymer (Loretex). Some growers have left the covering on year-round with good results.

The application of the plastic to the greenhouse is similar to the method used with poly houses. Where the frame is steel or aluminum, a 2" x 4" or 2" x 6" nailer will have to be bolted to the frame at the locations where the plastic will be attached. On houses that are covered with a single sheet, this would be the end frames and along the foundation or eave.

A double furring strip is used to hold the plastic. Double headed nails should be used to facilitate removal. A small squirrel cage blower operating continuously supplies the air to keep the plastic inflated. In tight houses, one blower should be sufficient. In large houses or where a poor job of attaching the poly was done, a larger blower or more than one may be needed.

The blower should be mounted inside the house and the air ducted with plastic tubing or flexible dryer hose through the glass. A sliding sheet metal damper attached to the blower inlet allows the pressure to be adjusted to 0.2 inch water static pressure. This can be measured with a monometer made from a piece of 1/4 inch plastic tubing bent into a U and fastened to a small piece of plywood. Further details on the installation of the fan can be found in Connecticut Greenhouse Newsletter No. 53 or in Bulletin 74-45 available from the author.

Where adequate fan or fan and tube ventilation is installed, ridge and side vents can be covered. If there are no fans, the plastic will have to be attached to allow these vents to operate.

Light levels inside the greenhouse may be reduced slightly by the addition of the poly layer. Drip pro-

blems will most likely be reduced because the glass layer will remain warmer. Growers should also check with their insurance company to determine if there is any change in their coverage using this practice.

The following example will give an indication of the costs involved and the yearly savings made by adding a copolymer layer to a tight 30' x 100' glass greenhouse:

No. 2 fuel oil used with single glass cover	7500 gals./year
No. 2 fuel oil used with added poly layer	5200 gals./year
Fuel oil savings	2300 gals.

Reduced heating costs--2300 gals. @ 40¢/gal.		$920
Cost of plastic and labor to install	$200	
Cost of lumber, furring strips, blower and labor amortized over 5 years	70	
Electricity for 6 months of operation	10	
Total yearly costs		280
Yearly savings		$640

Additional heat savings can be gained by installing an insulation barrier along concrete foundation walls and behind heat pipes. One-half or one inch of Polyurethane or Polystyrene Board faced with aluminum and approved by Underwriters Laboratories or Factory Mutual Corporation will decrease heat loss through these walls.