

WHAT SIZE GREENHOUSE HEATER?

*John W. Bartok, Jr.
Extension Agricultural Engineer*

The heat loss from a greenhouse depends upon its location, surface area, temperature to be maintained and covering. The heating system that you install should be capable of maintaining the greenhouse at the desired temperature on the coldest winter day.

For the Connecticut, Massachusetts, Rhode Island area, heat loss for a single glazed glass, fiberglass or plastic film greenhouse can be estimated from the following formula:

$$\frac{\text{HEAT LOSS (Btu/Hr.)}}{\text{DESIRED INSIDE TEMPERATURE}} = 1.25 \times \text{SURFACE AREA} \times$$

For a double-filmed greenhouse:

$$\frac{\text{HEAT LOSS (Btu/Hr.)}}{\text{DESIRED INSIDE TEMPERATURE}} = .80 \times \text{SURFACE AREA} \times$$

SURFACE AREA in square feet can be calculated by adding the areas (length x width) of the roof, side walls and end walls.

DESIRED INSIDE TEMPERATURE is the night-time temperature at which the crop will be grown.

To provide for winter ventilation, particularly if high humidity and disease appear to be a problem, add 10% to HEAT LOSS. In windy locations an additional 10% should be added to HEAT LOSS.

EXAMPLE: Calculate the heater size for a 25' wide (40' over) by 100' long double film pipe arch greenhouse with a crop of greenhouse tomatoes requiring a minimum night-time temperature of 60°F.

SURFACE AREA = 40' x 100' + 500 sq. ft. (end wall area) = 4500 sq. ft.

HEAT LOSS = .80 x 4500 x 60 = 316,000 Btu/Hr.

Add 10% for winter ventilation 31,600 Btu/Hr.

Add 10% for windy location 31,600 Btu/Hr.

Total HEAT LOSS = 379,200 Btu/Hr.

The heater you install should have an output equal to or greater than the HEAT LOSS. When using unit heaters, two small heaters are preferred to one larger one as this gives a safety factor, should one fail.