LOW COST PLASTIC GREENHOUSE SHOWS GREAT PROMISE LOCALLY

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A 96 x 16 foot plastic greenhouse can be built at about one-eighth of the cost of a comparable glass greenhouse, or approximately $800 as compared with $6,000. The structure has no foundation and the roof is made of sliding panels of plastic, which not only solve the ventilation problem but also can be easily removed in summer, when hot sun would break down the plastic.

The plastics, including polyethylene, polyvinyl, cellulose triacetate, can be of various thicknesses. During the past winter and early spring,, an experimental structure built at Cornell University withstood winds up to 75 miles an hour, and two heavy snowstorms, with depths of 18 and 12 inches. Although these storms heavily damaged fences, trees, and power lines throughout the area, the greenhouse showed no sign of damage.

Substitute for Glass

It was found also that very thin polyethylene material (.002 inch thick) held up just as well as the heavier weights (.003 and .004 inch) and that there was no significant difference in light transmission between the various weights. This type of greenhouse is not intended completely to replace the more durable glass structures but it will serve as an inexpensive substitute for many growers.

The plastic panels should be removed around the end of May to prevent sun damage to the plastic. One man can accomplish this dismantling in a very short time.

Plans Available

So simple is the construction of this building that anyone with a basic knowledge of carpentry can easily build one. Construction plans will soon be available at the Department of Vegetable Crops, Cornell University, Ithaca, N. Y., or for $4.75 from Louis Eastwood, P. O. Box 693, Riverhead, Long Island.

The design of the Cornell plastic greenhouse is such that it can be made any length to suit growers needs. The 4 x 4 inch posts were treated and sunk 3 feet in the soil. These could be set in concrete, but were not in the Cornell house.

Sliding Roof Panels

The roof panels were constructed of 5/4" by 2" pine. This provides a sturdy light-weight panel that can easily be handled by one man. No. 10 screws, 3 inches long were used to fasten the joints; however, corrugated fasteners can be used in place of screws. Also metal braces, two for each sash were attached to keep the panel bars parallel.

Similar panels were planned for the side walls, but time did not permit their construction in this experimental house. Plastic stretched over the sides served fairly well, but it is not as satisfactory as panels because it is difficult to get it tight enough when applied outdoors. The panels were covered in a warm room, the plastic expands when it is warm, and when installed, the colder outside air causes it to shrink and tighten.

Two Layers Better

One significant finding in this research was that two layers of plastic (one on the outside and one on the inside of the panel frame) had many advantages over a single layer. This provides a dead air space between the two layers which has a high insulation value. The inner surface of the double layers always felt much warmer than did that of the single layer. Another decided advantage of the double layer is the lack of condensation but this has not been true in local plastic houses. The single layer panels are cold and the resulting moisture condensation on the plastic noticeably reduces light transmission. By actual measurements in the Cornell house more light came through the double layers than through the single.

Polyethylene Good

In general, all of the polyethylene materials transmitted about the same amount of light. On a clear day with an open sky reading of 8400 foot-candles, approximately 7000 foot-candles came through or about 83% transmission. The polyvinyl material (.004") gave 5800 foot-candles or about 70%.

It should not be concluded, however, that all polyvinyl is inferior to polyethylene in light transmission, because manufacturers are now producing polyvinyl with as much clarity as glass. This is a report on only the materials used in these tests. A grower could build a successful plastic house with either polyethylene of .002, .003, or .004" thickness.

Heating

Heat for these greenhouses can be any conventional type of heating unit. In the Ithaca house, new types of heaters that burn L. P. (bottled gas) were tested. The most satisfactory of those tested was a 160,000 B. T. U. heater. This is fully automatic, and if properly used does an excellent job.

The Cornell plastic greenhouse made of panels, offers many advantages over other types where the plastic is attached to the rafters. The panels can be covered in a warm room. When these are taken out in the cold air, the plastic shrinks and becomes very tight. This solves the problem of the plastic flapping in the wind. The panels can be removed during the summer months. This will prolong the life of the plastic. Ventilation, which can be a problem, is easily provided by sliding down as many panels as necessary. In the event of accidental damage, a spare panel can be slipped in place. The panels can be covered by farm help indoors during the winter, and the house can be readied for use in a very short time.

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