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GREENHOUSE COVERING — WHAT CAN BE USED?

ALAN J. NEWPORT

Dundas Nursery Supply Co. Pty. Ltd.
Dundas, New South Wales

The number of greenhouse covers are almost as varied as the crops grown within. Some of the covers are polythene (polyethylene), both ultraviolet inhibited and, for short term crops, non-treated material, clear polyvinyl chloride, Mylar (Dupont), certain nylon reinforced polythene and vinyl sheets (e.g. polyscrim).

In the rigid sheet we have polyvinyl chloride (e.g. Vinlon Tuflite), acrylic and, of course, fibreglass, either with or without tedlar (Dupont) coating. There are, of course, variations of these and other materials. Finally there is glass.

The following more common materials being used will be discussed, namely glass, fibreglass, rigid P.V.C., and polythene. In these we have a range of coverings that will meet the needs of growers over the whole of the climatic regions of the continent and the horticultural crops they grow. They also represent the materials currently most widely used.

Glass. The oldest covering used in horticulture and, in Australia, still one of the most popular. Glass has the advantage over all other materials in having a known life expectancy; the structure will give out long before the glass wears too thin. Light transmission is high and suitable for all crop growth. It is easy to paint and comparatively easy to clean. It is not flammable and, in Australia, is reasonably priced.

There are, however, some disadvantages, namely the design limitations and the need for structures to carry the weight. To ensure a tight house the structure has to be well designed, usually using extruded aluminum and featuring large glass sizes and plastic mastics to give a good seal to the glass and ridge and side vents. These houses are not made in Australia. Imported models, however, are available and represent excellent structures. The locally available houses are constructed to the size of the glass sheets available — ranging in size from 16″ × 14″ to 24″ × 24″, the largest. The glass is carried in rafters, usually galvanized steel, and a simple glass clip is used to support

the glass. These houses are quite adequate for a large range of crops, however they are naturally far more expensive to heat having losses through the joints of each pane. A lining of polythene is sometimes used to offset this. Dust is another problem with this structure, cut flowers suffering the most damage; the polythene helps this problem as well.

In heavy hail belt areas hail guards are usually a good insurance. Roof leaks are fairly prevalent after a few years with the local small pane type house due to cracks in the glass, usually at the clips, etc., caused in the whitewash cleaning. As well, the small gutters in the rafters become clogged with dust and whitewash and cause quite extensive leaks.

Fibreglass. This material is becoming very popular in Australia following its growth pattern in the U.S.A. It is a very flexible product which allows for dome type houses. This adds strength to the material, allowing it to withstand quite heavy hail. It is extremely easy to fix. The structure of the house can be much lighter. Light transmission is quite good in the standard sheets in the first few years, deteriorating after this. White fibre glass can be used for lower light intensity crops — thus saving on painting, etc. The standard sheets have to be cleaned and recoated after about five years. This time can be extended if the painting is done on the outside thus protecting the resin. If tedlar (polyvinyl fluoride) is bonded to the fibreglass during the forming of the sheet it does away with this light transmission deterioration already referred to. However in Australia the manufacturers of this process will not give any guarantee. This is most disturbing and until that can be extended the additional cost involved in questionable.

The heat loss from fibreglass is minimal compared to glass because the structure generally is very tight; however a disadvantage is that the material does burn.

Rigid Polyvinyl Chloride. In Australia this material is known as Vinlon or, more recently, as Tuflite. It has ultraviolet inhibitors added during its forming and has an acrylic finish on the weatherside to give long life.

This material has had a manufacturer's guarantee on its life of 15 years. Earlier sheets of Vinlon did break down and light transmission was considerably reduced. The acrylic coating has prevented this in the material that is currently in use. Its characteristics for construction etc., are similar to those described for fibreglass.

Polythene (Polyethylene). Many and varied structures are being used in Australia with this versatile film. The single film of .004 or .006 (that is 100μ or 150μ) ultraviolet-inhibited sheets provide an excellent material for igloo structures of a temporary

or permanent type. In the single form with no sophistication, it is desirable to have doors at either end and, if no other ventilation is provided, it is best to keep the length as short as possible, 40 to 50 ft., being the maximum. The larger the structure in height and width the better for plant quality. A simple vent along the ridge is also practical.

The more sophisticated houses can feature double skins with a constant bag of air providing good insulating properties for both heating and cooling. Fan jet heating and cooling can be provided — as well as exhaust fans and pans, space heaters, etc. Aluminum cover clips are available to carry the two skins. These accessories also can take single skins with shade cloth to provide a shaded greenhouse if desired.

The use of this versatile material is extensive and gives a very reasonably priced greenhouse. The life of ultraviolet-treated polythene is approximately 2 years with some growers getting more than this. Light transmission is good and plant growth is also very good. Double skins do restrict the light transmission a little; however, very few, if any, crops would be affected.

Costs. These represents only the approximate costs of a square foot of the material desired. Consideration should be given to the factors that make up the completed greenhouse. For example, a polythene house, may be a temporary or permanent structure, carrying heating and cooling equipment, etc., and it may be a single or multi-bay structure. Lighter structures are needed for fibreglass or rigid P.V.C. as compared to the heavier structures required for glass. Note also that in the glass cost the price of rafters are included in the square foot price. Prices quoted are Sydney, N.S.W. prices and are approximate only.

Glass and rafter	32.5¢ to 37¢ per sq.ft.
Fibreglass — standard	30¢ per sq.ft.
Fibreglass — Tedlar treated	54¢ per sq.ft.
Rigid P.V.C. — Tuflite	
Industrial	89.2¢ per sq.ft.
Domestic	44¢ per sq.ft.
Polythene (ultraviolet inhibited) .002	0.75¢ per sq.ft.
Polythene (ultraviolet inhibited) .004	1.50¢ per sq.ft.
Polythene (ultraviolet inhibited) .006	2.25¢ per sq.ft.