

We have found some first rate chestnuts, mainly in the North Island; they are now recognised by the Government as an official export crop and we are all set to go.

ACCEPTANCE OF GLASS SUBSTITUTES IN GREENHOUSE CLADDING AND DESIGN

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Here in New Zealand, isolated as we are from the major horticultural areas of the world, new techniques and developments gain acceptance only slowly. New materials for the greenhouse skin are no exception. In recent times, other work (1) has covered the characteristics and operating costs of the alternatives. The aim of this paper is to comment on the current useage of these materials and their applications on the basis of information gleaned from greenhouse builders and growers themselves.

There are certain overlying considerations when choosing a covering and design:

1. The initial outlay.
2. The heat conservation properties of the total structure.
3. Repairs and maintenance, including re-cladding.

To put this another way, the operating costs of the proposed design per unit of area are a major deciding factor. This figure must, however, be balanced against any change in the yield or growth characteristics of the crop in a new environment. The necessity for and the cost of implementing any change in management practice under new conditions must also be considered.

Discussions with greenhouse builders indicate demand in the following areas:

1. Glass in single or multiple span remains popular with the preference being for aluminium construction for low maintenance. The higher cost of aluminium structures as compared with wood means that this is not always feasible. This type of structure appeals to growers of high light-demanding crops, in particular, winter production of vegetables.
2. Non-rigid plastics of the polyvinyl chloride (PVC) and ethyl vinyl acetate (EVA) types pioneered the plastic

alternative. Their comparatively low capital cost and their flexibility in useage are major attributes. When two sheets are combined as a double film, separated by a layer of air, thermal efficiency is greatly improved. These films are being used with increased frequency in large-scale permanent operations.

- 3 Rigid plastics in current use in New Zealand are of two main types—
 - (a) Corrugated sheets of fibreglass reinforced acrylic plastic laminated with poly vinyl fluoride.
 - (b) Double skinned polycarbonate reinforced with plastic ribs

The main reasons underlying the grower's decision to use these products are the potential heat savings over glass, the strength and lightness of the sheet for easy handling, and their properties of light diffusion which renders the use of shading unnecessary for some crops even in mid-summer.

A strong feeling is evident even amongst those growers using these materials that the risks associated with producing a crop under a glass alternative are higher. This reasoning is on the basis of.

1. Inflammable nature of most of these products.
2. Structural deterioration, particularly of the non-rigid plastics, may place the entire crop at increased risk under wind or snow loadings.
3. Shortage of proven data on the weathering of coverings with respect to light transmission and structural deterioration.

Nurserymen and cut flower growers use a greater ratio of plastic to glass than other growers in general. The complexity of the situation and the range of alternatives offered makes it difficult to be sure that the best choice is made. As these materials gain acceptance, let's hope that the research for good practical information to help the grower rationalize his decision continues.

LITERATURE CITED

- 1 White, R A J 1978 Some comparisons between plastic and glass greenhouses *Proc Inter Plant Prop. Soc* 28 273-279