

Plastic Film Progress

Raymond Sheldrake
Department of Vegetable Crops
Cornell University

The aims of this study are primarily to evaluate plastic materials for use in covering greenhouses. It is difficult to decide when to present results of tests because of the rapidity with which new plastics are being released. The primary consideration, of course, in this study was the length of time a material would stand up under normal outside conditions. Other factors were observed such as light transmission, ease of application, temperature reaction of the film, affinity for dirt, etc.

In September 1957, all of the 1955 test materials were removed and seven materials were put into test. At that time, these were the ones that appeared to have the most promise for this use. Polyethylene was used as a base for comparison.

Each plastic treatment was a 4 x 10 foot panel and each treatment was replicated 3 times (Figure 1). An inner layer of 4 mil clear vinyl was cemented to the underside of each panel on all treatments (1 1/8" air space between layers). All treatment panels were randomized on the Southside of the test house.

Results

Table 1 shows the lengths of time in months the various plastic films lasted.

Table 1.—A comparison of the various plastic films under outside conditions. The films were applied September 15, 1957.

Type	Thickness in mils	Time to Failure in months
Polyethylene	4	11 (Sept. to Aug.)
Polyflex 230	10	13
Clear Vinyl	6	12.5
Rucoam (Vinyl)	4	16.5
KDAA 2817 (Vinyl)	4	16.5
Cellulose Acetate Butyrate	10	24+*
Mylar 200A	2	24+**

* Two of three panels shattered October 15, 1959.

** One panel broke out November 1, 1959.

Polyethylene was the first material to break down and this occurred in about 11 months. (September to August). However, bear in mind that this does not mean *Polyethylene* will last 11 months under all circumstances. One summer (June to August) will break down this film whereas the life is considerably longer from October to May. This is due to the greater intensity of ultra violet

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during the summer months which causes the break down of the plastic. Growers in New York who use removable panels from April 1st to June 1st got their third season out of Polyethylene this year.

Cold and shock tests were conducted on panels which had been exposed all summer. These tests were completed in late October. Panels were subjected to temperatures down to minus 40°F. Where plastic greenhouses will be exposed during the summer, and left exposed to cold New York winters, many materials will fail. Polyethylene, which will fail from summer ultra-violet exposures, however, was resistant to these extreme cold temperatures if it had not been exposed to the summer sun. Vinyls and butyrates become brittle and will crack in the extreme cold, especially after summer exposure. Mylar held up in these cold and shock tests even after being exposed to the summer sunlight. Plastics on unheated houses are more subject to cracking through the winter than on heated houses.

Thin *Fiber Glass* materials are now in our tests and look good. Costs are being reduced somewhat, and this material may make an entry into larger scale usage.

As these longer-life materials are released, better methods of attachment to the framework will need to be worked out. Simple stapling or covering with thin battens will no longer hold. The staples or battens will rust and rot before the plastic has deteriorated. Rust resistant nails or staples are worth considering.

By and large, New York growers are successfully using plastic greenhouses for many purposes. They are at present only temporary structures, but with the entry on the market of these newer materials, they will likely become more permanent.