ON HOUSE STORAGE AND REPEAT USE OF POLYETHYLENE FILM FOR COVERING GROWING STRUCTURES

J. PETER VERMEULEN

John Vermeulen & Son, Inc.
Neshanic Station, New Jersey 08853

Our nursery is situated in the fertile Raritan River Valley in Somerset County, New Jersey. We are in USDA climate Zone 6a, but because of the low elevation and valley position, our microclimate is that of Zone 5a. Frost-free days range from 142 to 196, spring to fall. Our average mean temperature is 10°C (51.2°F) with a maximum of 36.5°C (98°F).

Poly-covered overwintering structures for our container-grown nursery stock, which consists of woody ornamentals ranging from *Abies* to *Zelkova*, are a costly requirement for the production of top quality stock.

Our structures are variations of the quonset (hoop) style houses quite common in the trade. Because of the consistency of our soil, a silt loam, we have problems with our houses moving up and down from the heaving effect of frost. Initially we had problems with wind entering the houses and drying the containerized stock inside. We solved this by using a double layer of poly stapled to a 2″ × 4″ wooden stringer running the length of the house about 15 inches above ground level. Sand, lying at the bottom of the U created by the poly extending down from the stringer to the ground and back up again to the stringer, weighs the poly, keeping it pressed against the ground as it moves up and down throughout the fall to spring seasons.

For many years we covered the houses in mid-fall and kept them covered until after the last frost, which varies from late April to late May. To keep the air temperature within the houses at a more uniform low level we covered with white poly, the least expensive we could buy, provided it had a good percentage of pigment. Nevertheless, high inside temperatures into the 80's on warm late winter days sometimes forced early growth which then was susceptible to frost injury. To overcome this the poly was slashed, which allowed the heat to escape and also let in more light and yet still afforded protection from light frosts. This, however, spoiled the poly and prevented its further use. Poly was relatively cheap then, approximate ½¢ per square foot, thus the waste was an acceptable cost.

The 1973-74 oil embargo (our first warning of things to come, incidently) set the stage for a poly resin shortage which prompted the extruders to increase prices, much to our dismay,

beyond that warranted. The old Dutch nettle was aroused and that, when coupled with the austerity lessons left over from the Great Depression, caused us to take a closer look at our procedures.

For a few years we had been saving the clear poly which covered our heated houses by rolling it up tightly along the length of the houses towards the ridge rafter and tying the rolls in place there after covering them with black poly to block the damaging ultra-violet rays. We were, and still are, getting two winter seasons from the poly which is UV inhibitor-treated (Monsanto's 602). Perhaps we could get 3 or even 4 seasons of use from this grade; however, we have been too timid to try on these houses in which there is a disaster potential if the poly broke down, shattered or crumbled in mid-winter. Here I would like to suggest some applied research, perhaps the USDA, Horticultural Research Institute, or the Agricultural Extension Services.

With this experience we reasoned that our white poly on the unheated houses could be similarly saved and so, in 1974, we covered 15 houses with UV inhibitor-treated white poly (also Monsanto). We had to use 6 mil, as 4 mil was not then available. Using the technique I will describe, this poly is still on and is looking good going into its 6th season. In 1976, 4 mil 602 white poly became available and the remaining 18 unheated houses are now covered with it.

Some of you have seen this firsthand at the nursery, and the information has been published previously by Francis Gouin in Maryland Cooperative Extension Services, "Nurseryman's Notes", Sept.-Oct. 1976, based on observations made on the tour by this Society during our 1976 meeting.

I mentioned previously that we have 2″ × 4″ wooden stringers running the length of some of our houses. Some of these are bolted to the pipes driven into the ground into which the bow-ends are placed, thus supporting the arch. Some serve as a plate resting on top of posts and lag bolts are screwed into this plate. On other houses the bolts are screwed into railroad ties. In all cases we have wood to nail into that runs the length of the house. This is important to us because we fasten the poly to these stringers after rolling it first onto 1″ × 2″ wooden lath strips which then are nailed to the stringers (plate or tie). We use an 8 penny double-headed nail about every 1′ to 2′ depending on the condition of the wood being nailed into.

One side of the house is fastened first, the poly first being draped over the house. It is recommended safety practice to tack the other side to keep the poly secure while it is being permanently fastened on the first side. After that is accom-

plished the other side is secured. We try to cover with the poly on warm days without wind as the poly is more elastic then and permits a really good pull-down when rolled on the lath and nailed on the second side. All hands and often feet are urged constantly to muscle it down to get it drum tight. We don't want that poly to move and chafe against the bows. Later, when it gets colder and the poly shrinks, the house actually *sounds* like a drum when tapped.

The many advantages of this technique are as follows:

(1) First and foremost is that of economics. The poly now going into its 6th year was put on at a material cost of 0.96¢ per sq ft Today's cost is 3.21¢ per sq ft. Labor cost to pull off, dispose of and reapply the poly annually is about 0.0012¢ per sq ft. The labor to roll and cover is about 0.0064¢ per sq ft. We have a total annual saving of approximately $3357 on the unheated houses covered with white poly using a 6 year use factor and of $1207 on the heated houses covered with clear poly using a 2 year use factor (in both instances using an inflation factor of 10%). This totals about $4500 per year saved. In our installation this comes to about .0276¢ per sq ft (white .0329¢, clear .0205¢).

(2) Second is our contribution toward savings of energy in both the raw mineral product and the energy used for production and distribution.

(3) We have a capability of rapid recovering of the houses in the event of needed frost protection.

(4) We have greatly diminished our disposal problem.

(5) Additional saving of wood laths, productivity, supervisory time, overhead, etc.

We see no reason why, with some minor modifications, this technique cannot be adapted to almost any structure or method of poly sheet covering.

HADLOW COLLEGE — THE AIMS OF THE NURSERY STOCK DIPLOMA EDUCATIONAL PROGRAMME

A. BRUCE MacDONALD
Hadlow College of Agriculture & Horticulture
Hadlow, Tonbridge, Kent, England

BACKGROUND INFORMATION

Hadlow College is situated in Kent, some 30 miles south of London. The village of Hadlow lies between the towns of Maidstone and Tonbridge. As horticultural and agricultural col-