OVERWINTERING STRUCTURES IN CONNECTICUT
PART II: STORAGE

In the first article on overwintering (CGN 67:14-19, 1975) the environmental factors affecting the plant response to winter injury were reviewed. The objective of this paper is to survey various methods of storage which protect against winter injury.

METHODS OF STORAGE

Various methods have been tried from such simple ones as grouping plants tightly and then packing the root balls or containers with wood chips or sawdust. Other materials such as salt hay and evergreen boughs have also been used.

An old-fashioned type potato storage building, which is a cellar below ground, maintains excellent temperature and moisture levels. It rarely drops

Figure 1. An early A-frame polyethylene covered overwintering structure.

below freezing. As long as the temperature remains below 40°F, evergreens stored here to not need light.

Barns have been used to store plants but are not extremely effective owing to plants tending to dry out in these structures. Lining the barns with polyethylene or styrofoam can help to maintain a higher moisture level while, by cutting down on air exchange, the barns are cooler on warm days and warmer on cold nights.

Cold frames can be effectively used, especially if frames are dug out so they are below ground, and plants like conifers are mulched with hay. With cold frames water drainage is essential and precautions must be taken to control rodents.

Microfoam systems, consisting of very thin blankets, can be used very effectively helping to reduce labor needed with other type structures.

Figure 2. Low hoop-type overwintering structures.

The plants to be covered are watered about the time they freeze, layed down, covered with a microfoam blanket and then covered with a 4 ml. polyethylene sheet.

Snow fences, good for larger plant material, can be covered with polyethylene or kraft paper for greater warmth and humidity. The snow fence structure is erected around and over the tops of the plants. Substantial support may be necessary for protection from heavy snow. All plants should be watered thoroughly before they are covered and may be left untouched until spring.

The structure which finds the greatest use are the quonset hoop type greenhouse covered with polyethylene. Basic materials used to construct the average 14 foot wide house include 1" EMT electrical conduit pipe, 1 x 6" baseboard, 1 1/4" water pipe, 1 x 4" wooden purlin, pipe clamps and nails. The hoops, which cover a 14 foot span are inserted in the 1 1/4" water pipe which is 4 feet long and driven into the ground 2 feet. Hoops are generally spaced 5 feet on center and are connected by a 1 x 4" wooden ridge purlin. One inch pipe

Figure 3. Large, drive-in hoop-type overwintering structures.

clamps secure the hoops to the purlin. Size of the quonset houses varies depending on need, but usually the higher houses do not exceed 8 feet high while some may be as low as 30 inches.

ENVIRONMENTAL CONTROLS

Data from Fitzgerald (1970) shows that both air and soil temperatures in lower quonset structures were 7-9°F warmer than in higher houses. These high temperatures can be attributed to snow cover and the smaller surface area exposed. The build-up of high temperatures under clear polyethylene in particular can cause plants to bloom or start growth too early. White or clear poly can be used as covering generally 4-6 mils think. White poly has the greatest moderation of high temperatures, frequently being at or below outside air temperature at the warmest part of the day (Fitzgerald, 1970). Spray painting clear poly markedly reduces temperatures and this would appear to be a useful practice when using clear poly.

Houses should not be ventilated when root balls or containers are frozen (Havis, 1974). This can severely dry out plant tops. Humidity should be kept high in storage structures. If soil temperatures are allowed to drop to between 15-20°F, plant roots may be killed. When roots are injured in storage, the plants may begin growth in the spring, then die. Havis (1974) suggests irrigating root balls if they are not wet when they are not frozen because wet soil will stay warmer when the greenhouse temperature drops.

Gas heaters can be used in very cold weather to provide minimum heat. The heater should be located on one side of the structure near the end so

that heat can be blown down one side of the house and circulated up the other side. Small fans may be needed to establish a horizontal air flow (HAF) pattern. The thermostat should be placed opposite the heater above the plants a quarter of the way down the house. This will prevent premature shutdown of the heater.

LITERATURE CITED:

1. Fitzgerald, R.D. and J.R. Havis. 1970. A symposium on nursery container production. Pub. No. 73, Cooperative Extension Service, University of Massachusetts.

2. Havis, John R. 1974. Tolerance of plant roots in winter storage. American Nurseryman CXXXIX (1):10.